

Innovations for Ending Hunger and Improving Food Security in Africa: Perspectives of African Partners on German Green Innovation Initiatives

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With a foreword by Joachim von Braun, Professor at ZEF, Bonn University



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The PARI Project Management gratefully acknowledges the support by the German Ministry for Economic Cooperation and Development for the long term support for the PARI research program that addresses ending hunger and enhancing sustainable agrifood system development. Continued financial support for 10 years of a development research program is rather unusual. It demonstrates a strong commitment by BMZ to both, ending hunger and trust in research providing relevant insights for development policy.

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Foreword by Joachim von Braun, Center for Development Research, Bonn University and PARI Project

Africa's agricultural and food systems are at a historic turning point. Over the past decade, governments, farmers, researchers, and development partners have worked together to transform a sector that remains the backbone of African societies. Agriculture is the foundation for livelihoods, food security, and rural employment, and it is central to the realization of the African Union's **Agenda 2063**—a vision of inclusive growth and shared prosperity.

Pan-African strategies matter and so do country level strategies. Professors Admassie and Asante provide insights at country levels. It is noteworthy that many African countries have in recent years developed their own **national agrifood system transformation pathways**, initiated by the **UN Food Systems Summit of 2021**. Country-level outreach by the GICs and related PARI research have contributed to strengthened the ecosystems in which these pathways are being developed.

The **Green Innovation Centres (GICs)** under Germany's *One World – No Hunger* initiative (SEWOH) were conceived to support this transformation by promoting innovation, entrepreneurship, and value chain integration. Over ten years later, this partnership provides critical insights into what works, what must be sustained, and what requires rethinking.

In this report, **Prof. Assefa Admassie** (Ethiopia) and **Prof. Felix Asante** (Ghana) present an independent African perspective on these experiences. Speaking as African scholars and practitioners, they have scrutinized the work, lessons, and partnerships between African institutions and German cooperation through the GICs in their respective contexts. Their analysis captures insights of African partners

and reflects the aspirations of Africa's own strategies for agricultural transformation. Their report—prepared through extensive collaboration with research and policy institutions across the continent—stands as *the African voice reflecting on a decade of joint action*.

This study by African experts comes at a critical moment. The **Comprehensive Africa Agriculture Development Programme (CAADP)**, the **Malabo Declaration (2014)**, and the **Kampala Declaration on Agricultural Research and Innovation (2025)** collectively set Africa's long-term vision for agricultural growth, resilience, and food security. These frameworks already *constitute Africa's agricultural strategy*. Therefore, **what we need now is not a new Africa strategy from development partners, but a clear strategy on how to support Africa's own**.

German development cooperation should consider to:

- **Align cooperation with Africa's strategy:** Support the implementation of CAADP, the *Malabo Declaration*, and the *Kampala Declaration* rather than designing new frameworks.
- **Sustain and secure investments** in innovation, research, and capacity building, recognizing that transformation is a long-term process requiring stable partnerships beyond project cycles.
- **Strengthen local innovation systems**, ensuring that GICs and related programs are embedded in African national institutions—universities, extension systems, and local enterprises.



- **Facilitate African ownership** by shifting from donor-driven to co-financed, country-led mechanisms that empower local actors.
- **Build on what works:** support proven approaches such as *Farmer Business Schools*, *digital training platforms*, and *climate-smart innovations* that have shown impact.
- **Champion inclusive development** that places youth, women, and smallholders at the center of value chain transformation.

The Malabo and Kampala Declarations

The **Malabo Declaration (2014)** reaffirmed African leaders' commitment to ending hunger and achieving shared agricultural prosperity through CAADP. It called for accelerated investment and accountability. The **Kampala Declaration on Agricultural Research and Innovation (January 2025)** builds on this foundation by setting the next-generation agenda for science and innovation in Africa's agri-food systems.

Key priorities of the Kampala Declaration include:

- Deepening investments in *research, development, and innovation* (RDI) for agriculture and food systems;
- Strengthening *regional and continental collaboration* through the African Union and FARA;
- Advancing *climate-resilient and digital agriculture*;
- Promoting *inclusive innovation ecosystems* that integrate youth, women, and private sector actors;
- Enhancing *science-policy interfaces* to ensure evidence-based decision-making;
- Securing *long-term, predictable funding* for agricultural research and extension systems;

- Fostering *mutual accountability and learning* among African governments and partners.

Together, these commitments represent **Africa's roadmap for agrifood systems' transformation**—a vision that seeks resilience, sustainability, and equity through African-led innovation.

A Call to Continue and Deepen the Partnership

The Green Innovation Centres have shown that innovation, when locally owned and contextually adapted, can transform rural livelihoods and value chains. Yet this transformation remains fragile if not anchored in local systems and long-term financing. The lessons from this report call for BMZ and its African partners to continue cooperation on technological innovation for sustainable and productive agrifood systems, and in addition to innovate for **securing finance for continued investments** that facilitate institutionalized, African-led innovation ecosystems.

This is the time to reaffirm commitment by **strengthening Africa's own agricultural and innovation agenda**. Germany's support shall evolve into a *partnership of equals*, where African institutions lead the vision, and cooperation serves as an enabler of sustained change.

Acknowledging the African Voice

We gratefully recognize **Prof. Assefa Admassie** and **Prof. Felix Asante** as the principal African voices behind this reflection. Their joint study represents an African perspective on the SEWOH initiative and its Green Innovation Centres. It captures not only data and results, but also the views, aspirations, and critiques of African partners who lived and shaped these innovations on the ground.



A **German-language summary** of their study follows this Foreword, presenting the essence of their findings for German readers. The **full study by Professors Assefa and Asante** is included in the subsequent pages of this report.



Deutsche Zusammenfassung der Studie von Prof. Assefa Admassie und Prof. Felix Asante

Die vorliegende Studie von **Prof. Assefa Admassie** (Universität Addis Abeba, Äthiopien) und **Prof. Felix Asante** (Universität Ghana) wurde im Rahmen des PARI-Programms (Program of Accompanying Research for Agricultural Innovation) durchgeführt. Sie bietet eine umfassende, afrikanische Perspektive auf die deutsche Initiative „Eine Welt ohne Hunger“ (SEWOH) und die **Grünen Innovationszentren (GICs)** in Afrika. Ziel war es, aus Sicht afrikanischer Partner Lehren für zukünftige Kooperationen zu ziehen und Wege aufzuzeigen, wie die Zusammenarbeit zwischen Afrika und Deutschland langfristig zur Transformation der Agrar- und Ernährungssysteme beitragen kann.

Die Studie fasst Erfahrungen und Erkenntnisse aus **11 afrikanischen Ländern** zusammen, die an der SEWOH-Initiative teilnehmen. Die seit 2014 durchgeführte Initiative zielte darauf ab, die landwirtschaftliche Produktivität zu steigern, Wertschöpfungsketten zu stärken und die Ernährungssicherheit durch technologische, organisatorische und institutionelle Innovationen zu verbessern. Diese Zusammenfassung konzentriert sich auf die von den afrikanischen Partnern als *wichtigste Erkenntnisse* in Bezug auf Konzeption, Umsetzung und Nachhaltigkeit identifizierten Punkte.

1. Strategische Erkenntnisse: Innovation für nachhaltige Wirkung

Bedeutung kontextspezifischer Innovationen: In allen teilnehmenden Ländern hing der Erfolg stark von der *lokalen Anpassung* und weniger vom direkten Technologietransfer ab. Innovationen wie *bewurzelte Stecklinge für Kartoffeln in Kamerun, mit Neem beschichteter Harnstoff für Sojabohnen in Benin* und *Vertragslandwirtschaft in Burkina Faso* waren erfolgreich, weil sie an die lokalen Bedingungen angepasst waren und von lokalen Institutionen unterstützt wurden. Dies unterstreicht, dass die „Lokalisierung von Innovationen“ – die Anpassung der Technologie an die sozioökonomischen Gegebenheiten – oft wichtiger ist als die Neuheit der Technologie selbst.

Die Zusammenarbeit verschiedener Interessengruppen ist unerlässlich: Die GICs haben gezeigt, dass starke institutionelle Partnerschaften zwischen Forschungsorganisationen, Ministerien, privaten Unternehmen und Bauerngenossenschaften eine Voraussetzung für die Skalierung sind. Länder wie Benin und Burkina Faso profitierten von dichten Netzwerken von Akteuren (UNCPS, FECECAM, CCR-B, INTERSEB, UNAPROSEB). Wo jedoch die institutionelle Koordination schwach war, wie in einigen Regionen Kameruns und der Elfenbeinküste, kam es zu Verzögerungen bei der Umsetzung. Innovationssysteme müssen in *Ökosysteme des Vertrauens und der Rechenschaftspflicht* zwischen öffentlichen, privaten und zivilgesellschaftlichen Akteuren eingebettet sein.

Innovation erfordert begleitende Kapazitätsentwicklung: In GICs war ein wiederkehrender Erfolgsfaktor die *Ausbildung durch Farmer Business Schools (FBS)* und *Entrepreneurship Schools*. Diese verwandelten Landwirte in geschäftsorientierte Produzenten und stärkten das Eigentumsbewusstsein an Innovationen. Der *FBS-Ansatz* wurde von den Partnern wiederholt als eines der wirkungsvollsten Instrumente für Nachhaltigkeit genannt. Allerdings waren die Ergebnisse ohne kontinuierliches Coaching begrenzt. Mehrere Länder (z.B. Benin, Kamerun) empfahlen die Institutionalisierung



regelmäßiger Nachschulungen und die Integration von Modulen in die Lehrpläne der landwirtschaftlichen Hochschulen, um Qualität und Kontinuität zu gewährleisten.

2. Operative Lehren: Umsetzung und Skalierung von Innovationen

Stärkung der landwirtschaftlichen Wertschöpfungskette: Benin, Burkina Faso und Ghana zeigten, wie innovationsgetriebene Wertschöpfungskettenintegration messbare Gewinne bringt: Die Erträge von Reis und Sojabohnen stiegen aufgrund verbesserter Praktiken und Finanzierungsmechanismen deutlich an. In Ghana profitierten die Maisketten von verbesserten Sorten und geringeren Nachernteverlusten. Eine wichtige Erkenntnis: *Wertschöpfungskettenbasierte Innovationen* sorgen eher für wirtschaftliche Anreize und Skalierbarkeit als isolierte Maßnahmen.

Finanzielle Innovation als Wegbereiter: Ein großer Erfolg in Benin war das gemeinsam mit UNCPS und FECECAM entwickelte Modell des Gruppenkredits für den Kauf von Betriebsmitteln. Es ermöglichte Tausenden von Landwirten den rechtzeitigen Zugang zu hochwertigen Betriebsmitteln. In ähnlicher Weise erleichterten Vertragslandwirtschafts- und KMU-Förderprogramme in Burkina Faso den Zugang zu Krediten und Märkten. Allerdings bestehen weiterhin Herausforderungen: Lokale Finanzinstitute zögern nach wie vor, Kleinbauern ohne Garantien Kredite zu gewähren. Die Befragten betonten die Notwendigkeit einer *längeren Übergangsfinanzierung* und gemischter Finanzierungsmechanismen, um die Phase nach dem Ende der Geberunterstützung aufrechtzuerhalten.

Digitalisierung und Wissenstransfer: Digitale Schulungsinstrumente wie die *Atingi-Kits* in Benin und die *Bildboxen* in Burkina Faso und Kamerun verbesserten den Zugang der Landwirte zu Informationen. Die Einführung digitaler Technologien verlief jedoch uneinheitlich und wurde oft durch den Bildungsstand, die Konnektivität oder die Erschwinglichkeit eingeschränkt. Digitale Innovationen sind nicht von Natur aus transformativ; sie erfordern *parallele Investitionen in menschliche Kapazitäten und Infrastruktur*, um wirksam zu sein.

Einbeziehung von Jugendlichen und Frauen: Gezielte Jugendbeschäftigung (z.B. Mechanisierungsdienstleistungsunternehmen in Burkina Faso) und die Stärkung der Rolle der Frau (Maniokverarbeitungsbetriebe in der Elfenbeinküste, Geflügelproduktion in Kamerun) wurden als nachhaltige Erfolge hervorgehoben. Inklusionsstrategien waren am wirksamsten, wenn sie mit *Einkommensmöglichkeiten* verbunden waren und nicht nur auf Schulungen beschränkt blieben.

3. Übergreifende Erkenntnisse für zukünftige Kooperationsmodelle:

Der Bericht enthält detaillierte länderspezifische Bewertungen und leitet daraus Lehren auf Länderebene ab. Aus diesen Studien ergaben sich mehrere länder-übergreifenden Erkenntnisse.

Nachhaltigkeit über Projektzyklen hinaus: Fast alle Länder hoben den *vorzeitigen Rückzug aus Projekten* als großes Hindernis hervor. Die Partner argumentierten, dass 10-Jahres-Zyklen für institutionelle Veränderungen nicht ausreichten. Sie empfahlen *schrittweise Ausstiegsstrategien* – den Übergang von gebergesteuerten zu kofinanzierten Modellen –, um die Dynamik aufrechtzuerhalten.

Institutionelle Verankerung und Eigenverantwortung: Wo lokale Institutionen Eigenverantwortung übernahmen (z. B. ANADER in der Elfenbeinküste, UNCPS in Benin), hielten die Ergebnisse über die Finanzierung hinaus an. Im Gegensatz dazu hatten Top-down-Modelle Schwierigkeiten, sobald die



Präsenz der Geber endete. Daher hängt die langfristige Nachhaltigkeit eher von der Verankerung von Innovationen in bestehenden nationalen Systemen als von parallelen Projektstrukturen ab.

Bedeutung der begleitenden Forschung (PARI): Die Begleitforschung für landwirtschaftliche Innovationen (*Program of Accompanying Research for Agricultural Innovation, PARI*) lieferte wichtige Erkenntnisse für ein adaptives Management. Die Rolle von PARI als Brücke zwischen Forschung und Politik verbesserte die Projektverantwortlichkeit und den Wissenstransfer. Die Forschungsergebnisse wurden jedoch am stärksten genutzt, wenn *lokale Partner die Studien mitgeleitet* haben und die Ergebnisse in direktem Zusammenhang mit Politik oder Praxis standen.

Klimafreundliche und grüne Innovationen: Die GICs förderten erfolgreich klimaresiliente Technologien, einschließlich *integrierten Pflanzenschutz, Einsatz von Biodüngern* und *solarbetriebene Bewässerung*. Diese verbesserten nicht nur die Erträge, sondern reduzierten auch die Umweltbelastung. Allerdings bleiben die Erschwinglichkeit und die Wartung weiterhin Hindernisse. Die Lehre daraus: *Grüne Innovationen müssen wirtschaftlich rentabel sein*, damit Kleinbauern sie nachhaltig anwenden können.

Integration von Frauen und Jugendlichen: Projekte, die die Einbeziehung der Geschlechter mit wirtschaftlichen Anreizen kombinierten (z.B. Zugang zu Verarbeitungsgeräten für Frauen), erzielten eine nachhaltige Wirkung. Die Einbindung von Jugendlichen war dort erfolgreich, wo Innovationen nicht nur mit Bewusstseinsbildung, sondern auch mit *Unternehmertraining und Start-up-Unterstützung* verbunden waren.

Skalierung durch lokale Vorreiter: Peer-to-Peer-Lernen, insbesondere durch *Relay-Trainer* und *kooperative Netzwerke*, erwies sich als der effektivste Skalierungsmechanismus. Skalierung funktioniert am besten, wenn die *Verbreitung horizontal* erfolgt – also von den Landwirten selbst und nicht von externen Trainern vorangetrieben wird.

Als **übergreifende Folgerungen für die Entwicklungspartnerschaft im Agri-Food System** ergeben sich:

- **Afrikanische Ownership und Strategische Ausrichtung:** Afrika verfügt über eigene, kohärente Strategien – insbesondere den **CAADP**, die **Malabo Declaration (2014)** und die **Kampala Declaration (2025)**.
- **für das BMZ und Partnerinstitutionen empfiehlt die Studie**
 - o Unterstützung der afrikanischen Strategien (CAADP, Malabo, Kampala) statt neuer Agenden;
 - o Langfristige Investitionen in Forschung, Innovation und Ausbildung;
 - o Stärkung lokaler Institutionen und Finanzierungssysteme;
 - o Förderung der Teilhabe von Jugend, Frauen und Kleinbäuerinnen und -bauern;
 - o Ausbau regionaler Lern- und Austauschplattformen.

Eine nachhaltige Transformation der afrikanischen Agrar- und Ernährungssysteme gelingt nur, wenn Innovationen **afrikanisch geführt, lokal verankert und langfristig unterstützt** werden. Die SEWOH-Initiative hat hierfür wichtige Grundlagen gelegt. Künftige Partnerschaften sollten auf diesen Erfolgen aufbauen – mit Afrika als Gestalter seiner eigenen Entwicklung.



English Summary of the Study by Prof. Assefa Admassie and Prof. Felix Asante

The study at hand by **Prof. Assefa Admassie** (Addis Ababa University, Ethiopia) and **Prof. Felix Asante** (University of Ghana) was conducted as part of the PARI program (Program of Accompanying Research for Agricultural Innovation). It offers a comprehensive African perspective on the German initiative ‘**One World - No Hunger**’ (SEWOH) and the **Green Innovation Centres (GICs)** in Africa. The aim was to draw lessons for future cooperation from the perspective of African partners and to identify ways in which cooperation between Africa and Germany can contribute to the long-term transformation of agricultural and food systems.

The study synthesizes experiences and lessons from **11 African countries** participating in Germany’s *One World – No Hunger (SEWOH)* initiative and its *Green Innovation Centres (GICs)*. Implemented since 2014, the program aimed to boost agricultural productivity, strengthen value chains, and improve food security through technological, organizational, and institutional innovation. This summary focuses on what African partners identified as *the most significant lessons learned* in design, implementation, and sustainability.

1. Strategic Lessons: Framing Innovation for Sustainable Impact

Importance of Context-Specific Innovations: Across all participating countries, success depended heavily on *local adaptation* rather than direct technology transfer. Innovations such as *rooted apical cuttings for potatoes in Cameroon*, *neem-coated urea for soybeans in Benin*, and *contract farming in Burkina Faso* thrived because they were adapted to local conditions and supported by local institutions. This underscores that “*innovation localization*”—aligning technology with socio-economic realities—matters more than the novelty of the technology itself.

Multi-Stakeholder Collaboration is Essential: The GICs demonstrated that strong *institutional partnerships*—among research organizations, government ministries, private firms, and farmer cooperatives—are a prerequisite for scaling. Countries like Benin and Burkina Faso benefited from dense networks of actors (UNCPS, FECECAM, CCR-B, INTERSEB, UNAPROSEB). However, where institutional coordination was weak, as in some regions of Cameroon and Côte d’Ivoire, implementation lagged. Innovation systems must be embedded in *ecosystems of trust and accountability* between public, private, and civil-society actors.

Innovation Needs Accompanying Capacity Development: Across all GICs, one recurring success factor was *training through Farmer Business Schools (FBS) and Entrepreneurship Schools*. These transformed farmers into business-oriented producers and enhanced ownership of innovations. The *FBS approach* was repeatedly cited by partners as one of the most impactful tools for sustainability. However, training without continuous coaching limited results. Several countries (e.g., Benin, Cameroon) recommended institutionalizing periodic retraining and integrating modules into agricultural college curricula to maintain quality and continuity.



2. Operational Lessons: Implementing and Scaling Innovations

Agricultural Value Chain Strengthening: Benin, Burkina Faso, and Ghana showed how innovation-driven value chain integration yields measurable gains: Rice and soybean yields increased significantly due to improved practices and financing mechanisms. In Ghana maize value chains benefited from improved varieties and reduced post-harvest losses. A main takeaway: *Value chain-based innovation*, rather than isolated interventions, ensures economic incentives and scalability.

Financial Innovation as an Enabler: A major success in Benin was the “*group input purchase credit*” model developed with UNCPS and FECECAM. It allowed thousands of farmers to access quality inputs on time. Similarly, Burkina Faso’s contract farming and SME support programs facilitated access to credit and markets. However, challenges persist: local financial institutions remain hesitant to lend to smallholders without guarantees. Interviewees emphasized the need for *longer transition financing* and blended finance mechanisms to sustain post-donor phases.

Digitalization and Knowledge Transfer: Digital training tools, such as *Atingi kits* in Benin and *image boxes* in Burkina Faso and Cameroon, increased farmers’ access to information. Yet digital adoption remained uneven—often limited by literacy levels, connectivity, or affordability. Digital innovations are not inherently transformative; they require *parallel investments in human capacity and infrastructure* to be effective.

Youth and Women Inclusion: Targeted youth employment (e.g., mechanization service enterprises in Burkina Faso) and women’s empowerment (cassava processing units in Côte d’Ivoire, poultry production in Cameroon) were highlighted as durable successes. Inclusion strategies were most effective when linked to *income-generating opportunities*, not merely training.

3. Cross-Cutting Lessons for future cooperation models

The report covers detailed country specific reviews and derives lessons at country level. A number of cross-cutting lessons emerged out of these reviews:

Sustainability Beyond Project Cycles: Almost all countries highlighted *premature project withdrawal* as a major limitation. Partners argued that 10-year cycles were insufficient for institutional transformation. They recommended *phased exit strategies*—transitioning from donor-driven to co-financed models—to maintain momentum.

Institutional Embedding and Ownership: Where local institutions took ownership (e.g., ANADER in Côte d’Ivoire, UNCPS in Benin), results persisted beyond funding. In contrast, top-down models struggled once donor presence ended. Hence, long-term sustainability depends on *anchoring innovations in existing national systems* rather than parallel project structures.

Importance of Accompanying Research (PARI): The *Program of Accompanying Research for Agricultural Innovation (PARI)* provided crucial evidence for adaptive management. PARI’s role as a research-policy bridge improved project accountability and knowledge transfer. However, research uptake was strongest when *local partners co-led studies* and findings were directly linked to policy or practice.

Climate-Smart and Green Innovations: The GICs successfully promoted climate-resilient technologies—such as *integrated pest management*, *use of biofertilizers*, and *solar-powered irrigation*. These not only improved yields but also reduced environmental impact. However,



affordability and maintenance remain obstacles. The lesson: *Green innovation must be economically viable* for smallholders to adopt it sustainably.

Gender and Youth Integration: Projects that combined gender inclusion with economic incentives (e.g., access to processing equipment for women) achieved durable impact. Youth engagement thrived where innovation was tied to *entrepreneurial training and start-up support*, not just awareness creation.

Scaling Through Local Champions: Peer-to-peer learning, especially through *relay trainers* and *cooperative networks*, emerged as the most effective scaling mechanism. Scaling works best when *diffusion is horizontal*—driven by farmers themselves rather than external trainers.

The following overarching conclusions can be drawn for the development partnership in the agri-food system:

- **African ownership and strategic orientation:** Africa has its own coherent strategies – in particular the **CAADP**, the **Malabo Declaration (2014)** and the **Kampala Declaration (2025)**.
- **For the BMZ and partner institutions, the study recommends**
 - Supporting African strategies (CAADP, Malabo, Kampala) instead of new agendas;
 - Long-term investment in research, innovation and training;
 - Strengthening local institutions and financing systems;
 - Promoting the participation of young people, women and smallholder farmers;
 - Expanding regional learning and exchange platforms.

A sustainable transformation of African agricultural and food systems can only succeed if innovations are **African-led, locally anchored and supported in the long term**. The SEWOH initiative has laid important foundations for this. Future partnerships should build on these successes – with Africa as the architect of its own development.



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1 Introduction

African Agriculture development challenges and opportunities

Agriculture plays a pivotal role in Africa, commanding a substantial share of the continent's social and economic activities. It is the primary driver of economic and social development, providing employment to a significant portion of the population, generating foreign exchange, supplying raw materials for industries, ensuring food security and reducing poverty. Recognizing its importance, African governments and international development partners have prioritized policies and initiatives to enhance the sector's productivity and foster transformative growth. As a result, agricultural growth has accelerated in some countries, though many others continue to face significant challenges.

Despite recent progress, the sector remains constrained by numerous challenges, including technological limitations, insufficient infrastructure, ineffective policies, and weak institutional frameworks. Key obstacles include low productivity, inadequate land and natural resource management, limited market access and trade opportunities, minimal corporate sector involvement, and insufficient institutional reforms and coordination of research and technology transfer efforts. Consequently, millions of Africans—primarily small-scale subsistence farmers—continue to suffer from hunger and malnutrition. In most sub-Saharan African countries, agricultural productivity remains low, and the sector operates at a predominantly subsistence level, failing to generate significant positive spillovers to the broader economy.

Given the challenges facing Africa's agricultural and food sectors, improving agricultural productivity has become a critical priority. With the rising pressures of climate change and other compounding factors, agriculture must become more efficient, inclusive, resilient, and sustainable. Achieving enhanced production and higher incomes in systems dominated by smallholder farms with low productivity, weak organization, and inadequate marketing and processing infrastructure requires transformative and sustained improvements across the entire agricultural value chain. Various avenues exist for driving agricultural growth, and these need to be leveraged effectively.

Historically, the primary drivers of agricultural growth in Africa have been the increased use of inputs and the expansion of agricultural land. However, these strategies are proving unsustainable due to resource constraints. Research shows that innovations have contributed only 1% to agricultural growth in Africa, compared to approximately 3% in Asia and Latin America (Fuglie and Rada, 2013). This highlights the urgent need for locally adapted innovations to take center stage as the main driver of productivity improvements. Agricultural innovation has emerged as a powerful tool for addressing low productivity, with the potential to unlock sustainable and inclusive growth, reduce hunger, and create employment opportunities, particularly for youth (Larsen et al., 2009).

Significant progress in the sector requires the strategic use of both existing and emerging technologies to boost land and labor productivity and enhance the efficient utilization of natural resources. This, in turn, necessitates greater investments in research and development (R&D). Transforming rural areas and increasing the productivity of smallholder farms are vital steps in the fight against hunger and malnutrition in Africa, underlining the need for policies that foster technological and institutional innovations in agriculture. Despite the well-documented importance of innovation and its proven role in agricultural development, the adoption rate of modern technologies remains low in most African countries. Research efforts have often overlooked the critical task of scaling up innovations, leading



to missed opportunities for widespread impact. This has spurred growing policy interest in fostering investments in agricultural and food security innovations (von Braun et al., 2023).

African Development Policy Actions – CAADP and Agenda 2063

In response, agriculture and food security have risen to the forefront of Africa's political agenda, leading to initiatives aimed at enhancing the role of science and innovation. For example, the **Science Agenda for Agriculture in Africa (S3A)** was adopted in 2014 as a continental framework to accelerate Africa's transition to an innovation-driven, knowledge-based economy. This agenda promotes scientific solutions and partnerships to drive Africa's agricultural productivity and broader socio-economic transformation. It aligns closely with the Comprehensive Africa Agriculture Development Programme (CAADP) and the African Union's long-term **Agenda 2063**. Innovations for sustainable and robust agricultural growth are central to this strategy. However, despite the increasing political support for agricultural innovation, investments in R&D remain insufficient. Expanding these investments is crucial to fully realizing the potential of science and technology in driving sustainable agricultural growth and ensuring food security across the continent. The updated CAADP agenda – the **Kampala Declaration** of January 2025¹ – is noteworthy and shall also shape the development cooperation agenda with partners. The long term African agenda setting may suggest an equally long term agenda setting and support by development partners.

Development Cooperation – the German "One World – No Hunger" (SEWOH) special initiative

Various strategies have also been initiated by international partners to stimulate agricultural growth and enhance productivity in Africa. Among the key players, the German government has actively supported agricultural development on the continent, making food security, agriculture, and rural development central pillars of its development cooperation in Africa. Through the Federal Ministry for Economic Cooperation and Development (BMZ), the German government allocates significant resources annually to projects aimed at advancing agricultural development through targeted investments and policy interventions. A notable portion of this funding was channeled into the **"One World – No Hunger" (SEWOH)** special initiative, launched in 2014.² This initiative focuses on African countries experiencing high levels of hunger and malnutrition, aiming to foster agricultural innovation, improve food and nutrition security, and enhance the financial and environmental sustainability of agri-food sectors. African partners have a legitimate and great interest in learning from innovative development cooperation initiatives, such as the SEWOH, and that is a main purpose of this report.

The SEWOH initiative takes a strategic and holistic approach, aligning its efforts with the diverse agricultural and food security landscapes across Africa, which are predominantly composed of smallholder farming operations. By linking complementary programs and policies, the initiative creates a coherent framework to sustainably promote agricultural development and improve food

¹ <https://au.int/en/pressreleases/20250113/african-union-adopts-ten-year-strategy-and-action-plan-transform-africas-agri>

² In 2021, the "One World – No Hunger" initiative was renamed to become the "Special Initiative for the Transformation of Agricultural and Food Systems". For the purpose of the report, the term SEWOH is used throughout.



and nutrition security. Through these efforts, SEWOH contributes to addressing hunger and malnutrition while building resilience and sustainability in Africa's agricultural sector.

As a key component of the SEWOH, the German government has recognized the innovation potential in Africa and taken steps to improve food and nutrition security and sustainable agricultural value chains through the establishment of **Green Innovation Centres (GICs)** starting in 2014 across several African countries (Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Nigeria, Togo, Tunisia and Zambia). The primary objective of these Centres is to promote the adoption of innovations in agriculture and the food sector, thereby increasing the incomes of smallholder farmers, creating employment opportunities—particularly for youth and women—and improving regional food supply in selected rural target regions.³ From an African perspective, political commitment of countries to agriculture transformation, indications of progress in agricultural innovation and in hunger reduction are of high relevance for the foundations of mutually fruitful development cooperation.

GICs were established by identifying high-potential crops and by building or strengthening sustainable value chains around them. These value chains range from cereals, fruits, and vegetables to tubers and livestock, depending on the national context. The support offered by the Centres includes advisory services, education, and training programs to enhance input use, technical expertise, organizational and management capacity, and climate resilience among farmers. In the implementation of these activities, the GICs collaborate with a network of stakeholders, including research organizations, demonstration farms, agricultural schools, decentralized training programs, and advisory services. This ecosystem shall facilitate the integration of farmer feedback into research and fosters cooperation between farmers, private sector players, and policymakers. The German development agency **GIZ** has played a central role in establishing GICs across 14 African countries and India.

Accompanying Research: The role of PARI

For quite some time, the development research community and their African partners have called for research programs to be embedded in development investments. Therefore, it was a significant and applaudable innovation that BMZ established such an approach for the SEWOH, bringing together African and German research communities with practitioners and policy advisors. To support the SEWOH initiative and the GICs, the **Programme of Accompanying Research for Agricultural Innovation (PARI)** was launched in 2014 as an independent accompanying research program. PARI brings together partners from Africa, India and Germany to conduct research on sustainable agricultural development, food systems transformation, and food and nutrition security in Africa and India (von Braun, Gulati 2025). With regard to the GICs, PARI sought to

- support and improve the work of existing African innovation institutions
- accompany specified innovations at the GICs with impact research and identify further innovation opportunities
- fosters synergies with and links to existing innovation centers in the respective countries' innovation systems, and more broadly in Africa.

³ See <https://www.giz.de/en/worldwide/32209.html>. Information about the activities of the different GICs can be found here : <https://gaie.atingi.org/>.



With the generated research-based information, PARI was tasked with strengthening the integration of the GICs into the national, regional and continental institutional partner settings to enhance value chains and rural and agricultural development.

PARI is led by a consortium consisting of the Center for Development Research (ZEF) at the University of Bonn, the Forum for Agricultural Research in Africa (FARA) and its network of national partners, AKADEMIYA2063, the African Growth and Development Policy Modeling Consortium (AGRODEP) facilitated by AKADEMIYA2063 (formerly IFPRI), the University of Hohenheim (UHO), and research collaborators in India. For further information, see Admassie (2023).

About this report

Activities for several GICs have already been concluded, while the remainder is set to be completed by 2026. It is therefore an opportune time to reflect on the learnings from this innovative development project. As part of this process, this report examines the current status and partnerships of GIC activities in selected African partner countries from the perspective of African partners to extract lessons for future interventions. The insights presented in this report are based on qualitative data collected in 2024-25 through key informant interviews with African local GIC partners, including representatives of national agricultural research organisations, government ministries, educational facilities, farmer organisations, civil society groups etc. In each country, a list of GIC partners was compiled by a country-based researcher from which a sub-set of interview partners were selected (4-10 per country). A uniform questionnaire was used to guide the interviews.

The following report summarizes the key findings for each of the GIC countries covered in this study, including a description of the GIC and its focus value chains, perceived impacts on the beneficiaries and project partners, innovations deployed in the country and reflections on successes and challenges of GIC activities. The final section draws out key lessons that emerged from the country analyses to inform the design of comparable initiatives in the future.



2 Lessons learned and recommendations

The **Green Innovation Centers (GICs)** in Africa have significantly enhanced the living conditions of millions of farmers and households through the introduction of innovative agricultural development practices. The project has notably contributed to increasing agricultural productivity and promoting the adoption of **Good Agricultural Practices (GAPs)**, as documented in various country reports. Through this intervention, some notable progress was made in the target countries in developing climate resilient farming systems. Drawing from the rapid assessment, several lessons have been identified, alongside key challenges that need to be addressed in future interventions. This section summarizes the most important insights and lessons derived from the country reports to guide and inform ongoing and future agricultural development efforts.

LESSON 1: Enhancing Agricultural Productivity through Innovation

The report indicates that the interventions contributed significantly to increased crop productivity in the target countries. A key strategy for reducing hunger, combating malnutrition, and ensuring food security is the adoption of innovations that enhance agricultural yields.

As part of the GIC initiative, improving the productivity of selected crops, diversifying agricultural activities, and enhancing producers' living conditions were prioritized across all participating countries. The GICs demonstrated their potential to transform the agricultural sector through technical, organizational, and financial innovations. These efforts have led to notable improvements in agricultural productivity, as evidenced by case studies, despite challenges in directly attributing outcomes to the intervention.

For example:

- In Ghana, maize and rice yields increased significantly in regions implementing the project compared to non-implementing regions.
- In Benin, soybean productivity rose by 60%, while rice production increased by 30%.
- The GIC contributed to increasing productivity in the cocoa sector in Cameroon by introducing innovations related to planting materials, cultivation techniques, post-harvest management (fermentation/drying) and processing.
- Burkina Faso increased the income of seed producers and farmers in the rice and sesame value chains by promoting the use of certified seeds from improved, climate-resilient, and high-yielding varieties.

Additionally, the project developed innovative financing mechanisms, strengthened farmers' entrepreneurial capacities, and fostered stronger connections between farms and markets in the respective countries. Collectively, these initiatives have far-reaching implications for sustainable agricultural productivity.

LESSON 2: Political Support Drives Agricultural Innovation and Investment Success

Strong political support for agricultural innovations significantly enhances the likelihood of achieving positive outcomes from investments. The GIC interventions have been implemented in countries where agricultural development and food security are high priorities on the political agenda. These



countries face persistent challenges of hunger and undernourishment, but have demonstrated significant commitment to addressing these issues. In all intervention countries, the Ministries of Agriculture are the main public institutions providing legislative frameworks.

One notable example of this commitment is the adoption of the Science Agenda for Agriculture in Africa by all project countries. Published in 2014, this agenda serves as a framework for identifying key issues, scientific solutions, and partnerships to transform national science and technology institutions. Its primary goal is to drive social and economic transformation through a more productive and efficient food and agricultural sector.

Similarly, the intervention countries have embraced the importance of agricultural research and innovation by approving the Science, Technology, and Innovation Strategy for Africa 2024 (STISA-2024). This continental framework supports Africa's transition to an innovation-led, knowledge-based economy, aligning with the broader and long-term vision of the AU Agenda 2063. One of STISA-2024's six priority areas is eradicating hunger and achieving food security, reinforcing a shared commitment to agricultural transformation across the continent.

Many of the GIC countries have already signed the CAADP compact, and some have even established Agricultural Innovation Centers, further cementing their dedication to agricultural development. A strong advancement in the CAADP process and improvements in productivity indicate political support and good investment conditions in a country. By aligning its initiatives with countries committed to these frameworks, the GIC project can support sustainable innovations in the food and agricultural sectors.

LESSON 3: Value Chain Focus Drives Tangible Results

The GIC initiative emphasized a value chain approach, providing targeted support to address specific needs within the framework of each country's agricultural strategies in each participating country. This focus aimed to spur growth and foster innovations by selecting value chains based on the relative importance of the specific crops or agricultural activities in each country. Following this principle, the participating countries were given the leverage to select the specific value chain in their respective locations as well as the kind of intervention with high potential return.

For example:

- In Ghana: Formal and practical training was provided across value chain actors, improving farming techniques and practices.
- In Togo: New orchard management techniques demonstrated significant advancements compared to traditional local methods, while the establishment of cost structures at production sites improved economic management.
- In Burkina Faso: The agricultural value chains were strengthened through training, technical support, and enhanced market access. Additionally, improvements in processing and marketing techniques enabled farmers to reach new markets and increase the added value of their products.

This value chain approach has fostered stronger interactions between different segments of the chain, enhancing overall cohesion and efficiency. The results have underscored the importance of focusing



on value chains with high marginal returns on investment and their contribution to poverty reduction and household food security.

Moreover, the initiative targeted value chains with robust backward and forward linkages, generating significant employment opportunities and higher incomes for farmers, particularly benefiting women and youth. This holistic approach highlights the potential of value chains to transform rural livelihoods and drive sustainable agricultural development.

LESSON 4: High Returns on Agricultural Investments Drive GIC Interventions

The GIC investments were strategically implemented in countries with a high rate of return on agricultural investments. The critical role of the agricultural sector in reducing hunger, combating malnutrition, and achieving food security is well documented in the literature. Across the countries involved, agriculture serves as a cornerstone of economic development, contributing significantly to livelihoods, employment, and income generation of the population, particularly for women and youth in rural areas.

The interventions prioritized:

- Enhancing agricultural productivity.
- Increasing farmers' incomes.
- Creating income and employment opportunities, especially for vulnerable groups such as women and youth.

The countries were selected based on their strong potential for agricultural productivity gains, their reliance on smallholder farming, and the agricultural sector's central role in employment and income generation for vulnerable populations. The geographic focus of the interventions also offered significant opportunities for scaling up impacts across regions.

Given the importance of agriculture, these countries have demonstrated increasing support for agricultural research and innovation, albeit from a relatively low starting point. This commitment is exemplified by the Science, Technology, and Innovation Strategy for Africa 2024 (STISA-2024), which aims to accelerate Africa's transition to an innovation-led, knowledge-based economy within the broader and long-term framework of AU Agenda 2063.

By aligning interventions with regions that promise high returns to agricultural investments and a scalable impact, the GICs have effectively maximized their contributions to agricultural transformation, poverty alleviation, and food security in the target countries.

LESSON 5: Partnerships Enhance Innovations for Agricultural Development by Leveraging Strengths

A partnership approach to agricultural development is essential, as it capitalizes on the strengths of development partners and fosters collaboration among value chain actors. Innovation adoption requires the concerted efforts of all stakeholders, including Ministries of Agriculture, which play a pivotal role in regulation and creating a conducive policy environment.

The GIC project adopted a partnership model to maximize the strengths of various actors and support innovation-enhancing investments in agriculture. This collaborative approach facilitated the scaling up of promising results and strengthened working relationships to achieve set targets and objectives.



Some of the GIC partner organizations also continue to collaborate with other projects and programs to further disseminate the innovations and good practices introduced by the GICs.

The GIC intervention was unique in its collaboration with diverse partners and stakeholders, including:

- Public sector organizations such as line ministries, departments, and quasi-government institutions.
- Private sector entities.
- Farmers' organizations and cooperatives.
- Research institutions.
- International and local non-governmental organizations (NGOs).
- Private sector-led initiatives.

This inclusive collaboration fostered stronger connections between research institutes, extension services, and producers, creating a favorable ecosystem for continuous innovation and the optimization of agricultural supply chains.

The success of this approach underscores the importance of an integrated model and a gradual transition to ensure the sustainability of agricultural interventions. It also highlights that no single method for disseminating innovations can adequately enhance the capacity of value chain actors. A multifaceted strategy is required to achieve project objectives and ensure long-term impact.

LESSON 6: Africa-Germany Partnership Aligns German Strengths with African Needs

The partnership between Africa and Germany in agriculture and food security leverages Germany's expertise while addressing Africa's specific needs. Innovation-enhancing investments in African agriculture and food security contribute significantly to the priority areas of German development initiatives and is aligned closely with the Sustainable Development Goals (SDGs).

Under the "One World – No Hunger" program, Germany has acted as an enabler, supporting African countries in implementing agricultural development measures outlined in their respective strategies. For example:

- Vocational Training and Applied Education: Proven methods from Germany were adapted for the GIC investments, equipping farmers with practical skills to improve productivity.
- German Science System in Agriculture: The system, characterized by close collaboration between researchers, farmers, agro-industries (including the seed sector), and civil society organizations, served as a model for the partnership in the GIC investment.

The GIC interventions focused on regions where hunger remains a pressing issue but where political efforts indicate strong potential for impactful support. This approach ensured that the partnership contributed to Africa's broader development goals while aligning with the SDGs.

By integrating German expertise with African priorities, the collaboration has delivered significant contributions to sustainable agricultural growth, addressing hunger and malnutrition, and advancing the shared objectives of both regions.

LESSON 7: Empowering Women and Youth in Agriculture is critical for success



Women and youth form the backbone of agriculture in most African countries, contributing the largest share of farm labor. However, their efforts often go unacknowledged due to deep-rooted cultural values and social norms that undervalue their work compared to that of men. Women and youth are frequently disadvantaged by laws, policies, and regulations, leading to limited access to resources and decision-making processes. This inequality often results in more challenging living conditions for women and youth, reducing their ability to fully participate in agricultural and economic development.

Recognizing this potential, the GICs have prioritized the empowerment of women and youth to ensure food and nutrition security and promote sustainable rural development. The GICs provided women and youth with access to resources, education, and employment, ensuring their equal participation in agriculture. This approach not only improved rural livelihoods but also fostered autonomy and self-determination among women and youth, transforming them into skilled farmers and entrepreneurs.

Key initiatives included:

- **Skill Building:** Training on sustainable agriculture practices, including input production, food processing, and climate-smart innovations, inspired women and youth and opened new opportunities.
- **Job Creation:** The project facilitated employment in agro-food processing, organic farming, and other sectors, generating income and reducing poverty.
- **Examples of Impact:**
 - **Benin:** Women farmers significantly reduced tomato wastage and enhanced productivity in the cashew sector.
 - **Togo:** Women transformed the cashew sector, creating new economic opportunities.
 - **Ghana:** Women-led training on rice parboiling empowered other women farmers and improved rice processing.
- **Burkina Faso:**
 - The Gender Action and Learning System (GALS), a community-led household methodology, empowered both women and men to take control of personal, household, and community development.
 - The Farmer Business School (FBS) training enhanced entrepreneurial skills, with over one-third of participants being women and youth.
 - Agro-food processing initiatives, particularly rice processing units, created numerous jobs for women and youth.
- **Côte d'Ivoire:** The introduction of cassava grinders reduced the physical burden of cassava cultivation for women, enabling them to process cassava more efficiently and increase their income.

By addressing gender and age-based disparities, the GICs interventions not only improved the livelihoods of women and youth but also contributed to broader goals of sustainable development, food security, and economic empowerment across the target countries.

LESSON 8: Outreach and Impact on Farmers and Households

A key objective of the GICs intervention was to reach as many farmers and households as possible by providing training on Good Agricultural Practices (GAP) to enhance productivity. The rapid assessment



confirmed that the project successfully impacted a significant number of households across the participating countries.

Key Achievements:

- Côte d'Ivoire: Many farmers reported improvements in their living conditions due to the diversification of agricultural activities. Support was provided through advisory, training, and logistical services, enabling farmers to adopt innovative inputs, techniques, and organizational practices. These changes improved productivity, income, and climate resilience. Beneficiaries included:
 - Cocoa cooperatives.
 - Women's groups engaged in cassava processing.
 - Women's groups involved in plantain production.
 - Agribusiness companies.
- Zambia: Over 1.5 million people were reached through interactive radio programs that promoted agricultural innovations, significantly increasing awareness and adoption of GAP practices.
- Ghana: The adoption of GAP led to increased yields and improved quality of both paddy and milled rice. This improvement directly enhanced productivity and income for participating farmers.

Through targeted training, advisory services, and innovative outreach mechanisms, the GIC intervention made substantial progress in improving agricultural practices, productivity, and livelihoods of millions of farmers and households across various countries. The project's broad reach and emphasis on practical support have set a foundation for sustainable agricultural development.

LESSON 9: Sustainability of the Intervention Remains a Concern

While the GIC intervention has achieved notable successes in improving productivity across value chains and developing innovative financing mechanisms, challenges remain regarding the sustainability and scalability of these gains post-GIZ funding. Ensuring the long-term impact and financial empowerment of partner organizations continues to be a significant issue in many target countries.

Key Challenges:

- Financial Limitations: Many organizations face difficulties accessing finance and mobilizing their own resources to sustain the progress made.
- Scaling Innovations: Extending the reach of successful innovations remains a challenge in most countries.
- Exit Strategies: Several countries lacked robust exit strategies, leaving local stakeholders without a clear path for continuing or scaling interventions after GIC support ends.

Examples of Sustainability Concerns:

- Malawi:
 - Implementing partners noted the absence of an effective exit strategy to ensure the continuity of interventions.



- Some respondents felt that the project formulation process did not actively or equitably involve all local stakeholders from start to finish.
- Benin: The withdrawal of GIC support was considered premature, leaving gaps in sustaining the momentum of the interventions.
- Mali: Producer organisations do not survive beyond the duration of the project due to governance challenges.

Addressing sustainability concerns is critical to ensuring the long-term success of the GIC interventions. Greater emphasis on engaging local stakeholders throughout the project lifecycle, developing robust exit strategies, and enhancing financial autonomy of partner organizations is essential for achieving lasting impact.

LESSON 10: Broader constraints in the agricultural context hinder innovation adoption

The countries' agricultural systems face a myriad of challenges that cannot be addressed by one project alone and hinder its effective implementation, including low levels of mechanization, limited access to inputs and lack of political support. Specific examples of related challenges include:

- Côte d'Ivoire:
 - Lack of sustainable political strategies
 - Poorly developed road infrastructure and market access
- Cameroon:
 - High cost of machinery and lack of spare parts prevent widespread adoption of machinery
 - Limited availability of day-old chicks and local breeds
 - Insecurity
- Nigeria:
 - Limited access to potatoes varieties and poorly developed input distribution systems
 - Insecurity
 - Limited market access and price volatility
 - Lack of public funding

LESSON 11: Collaboration and Coordination Challenges

Collaboration and engagement among GIC partners varied significantly, impacting the overall execution of the project. In some cases, partners were not fully involved throughout the entire project cycle—from the design phase to implementation and closure. This lack of consistent engagement limited the effectiveness of the partnership model and the alignment of efforts toward common goals.

Insufficient buy-in among project partners and beneficiaries also presented obstacles. Some farmers in Cameroon, for instance, proved reluctant to adopt new innovations, preferring to hold on to their traditional ways while others were unwilling to cover the cost of vaccinating their livestock. In Ghana, lack of self-motivation by some project partners hindered effective implementation.

Moreover, to achieve Africa-wide impacts, the GIC activities would need to be interconnected much more with each other across countries to facilitate learnings and innovation transfers.



LESSON 12: Data gaps hinder monitoring and flexible project implementation

Documenting the successes of the GIC while learning from its failures requires a solid empirical basis. However, the documented outcomes were not always seen to correspond with the observed realities on the ground. More rigorous assessments of GIC activities could motivate governments to scale-up the interventions to other geographical areas. They can also help to adapt the activities to local contexts and changing circumstances over the course of the project.

Recommendations

1. Extend Transition Period Before Funding Withdrawal

- Allow for a longer transition period to ensure the sustainability of interventions.
- Strengthen self-financing mechanisms for partner organizations to enable continuity of activities after donor support ends.
- Build the exit strategy into the design of the project from the outset, and base that on comprehensive collaborative M&E approaches.

2. Adopt an Integrated Approach to Sustainability

- Foster collaboration among all value chain actors, including farmers, policymakers, and private sector entities, and move from a value chain perspective to a food systems approach, as did the African policy strategies with the Kampala CAADP Declaration.
- Ensure strong political support and the creation of a conducive policy environment for agricultural innovation adoption.
- Invest in rigorous, transparent and inclusive monitoring frameworks to motivate project partners, generate political buy-in and support the mobilization of additional funds

3. Diverse and Inclusive Innovation Dissemination Approaches

Utilize a combination of methods to effectively disseminate innovations, such as:

- Farmer-to-farmer exchange visits to facilitate peer learning.
- Demonstration plots to showcase best practices and technologies.
- ICT-based messaging platforms for timely information sharing.
- Provision of training manuals, charts, pictorials, brochures, and fliers to support learning and adoption.

4. Stakeholder Engagement in Planning, Implementation & Monitoring

- Involve local stakeholders actively in all project phases—design, planning, implementation, and evaluation.
- Build and involve local capacities to ensure ownership and sustainability of activities and results.
- Align project goals and objectives with government development programs to ensure long-term relevance and support.



5. Capacity Building for Long-Term Impact

- Strengthen the skills and knowledge of farmers, women, and youth to enhance productivity and self-reliance through long-term capacity building and repeated initiatives.
- Further build and institutionalize the approach of accompanying research for sustainable development investments in food systems.
- Provide technical and entrepreneurial training to ensure continued innovation and sustainable development in agriculture.



3 Country reports

3.1 Benin (2014-2024)

3.1.1 Description of the GIC

Agriculture occupies an important place in the Beninese economy. It accounts for about 25% of GDP and is the main source of income for more than 40% of the Beninese population. The agricultural sector thus plays an important role in job creation, accounting for 42.7% of the total workforce. Benin's agricultural production is diverse, with strategic sectors such as rice, soybeans and livestock farming having strong development potential. The rice sector in particular, despite a constantly increasing production (234,830 tons in 2014), remains in deficit with a negative trade balance of -583.5 million USD, underlining the importance of increasing national production. The soybean sector is experiencing promising development with a production of 99,738 tons in 2014 on 97,783 hectares, while livestock farming, particularly poultry, represents an income-generating activity for many small producers. However, these sectors face common challenges: a decrease in arable land per capita (from 0.296 ha in 2007 to 0.260 ha in 2014), productivity levels to be improved, and a predominance of small farms. In this context, the interventions of the GIC are particularly important to increase the yields and incomes of small producers, improve food security, create jobs especially for young people and women, and contribute to the modernization and professionalization of these three strategic sectors.

Objectives of the GIC

The main objective of the GIC in Benin was to improve the productivity and incomes of smallholder farmers while promoting the sustainable development of the sector. They also aimed to increase productivity and create jobs in agri-food SMEs, while strengthening the skills of agricultural actors in terms of support and advice. The GIC sought to promote cooperation between the different actors in the selected agricultural value chains, improve the climate resilience of farms and scale up good agricultural practices. Finally, they worked to strengthen institutional governance and empower farmers' organizations and rural institutions, thus contributing to the structuring and professionalization of Benin's agricultural sector. The GIC project in Benin targets several categories of beneficiaries. The beneficiaries of the GIC project in Benin are small agricultural producers with less than 2 hectares, women (35% of beneficiaries), young people (50% of beneficiaries), agri-food SMEs, processors (rice mills, oil mills), traders, distributors, agricultural service providers, and professional organizations.

To achieve these objectives, the GIC developed a comprehensive training program through the Agricultural Entrepreneurship Schools (EEAs) and the coaching of SMEs. These trainings also targeted decision-makers and leaders of farmers' organizations to strengthen their managerial skills. In the area of agricultural innovation, the GIC promoted the adoption of new sustainable practices such as Good Agricultural Practices for intensive rice farming, the use of urea coated with neem oil for soybeans, and modern farming techniques for the poultry sector. Technical support was provided to partner organizations through the deployment of Technical Assistants and local Experts. Employment has been promoted through the creation of a skills center and the implementation of the Eссор approach.



Priority value chains

The GIC in Benin focus on three main value chains: rice, soybeans and integrated livestock (poultry/small ruminants).⁴ In addition to these sectors, the GIC work on two cross-cutting themes: organic farming and agricultural finance. The VICs also focus on agricultural mechanization and the use of information and communication technologies (ICTs) in agriculture. This approach allows the GIC to work on Benin's main crops while addressing important issues to modernize agriculture in the country.

National partners of the GIC

Led by the GIZ, the Green Innovation Centers for the Agri-Food Sector (ProCIVA) program in Benin relies on national strategic partners for operational implementation, in particular through the provision of technical assistants and local experts. The main implementing partners are: for the rice sector, the Consultative Council of Rice Farmers of Benin (CCR-B); for the soybean sector, the National Union of Soybean Producers' Cooperatives (UNCPS); and for the poultry sector, the National Union of Professional Poultry Farmers of Benin (UNAP-BENIN). Other farmers' organizations are also collaborating in the project: FUPRO (Federation of Producers' Unions), AJAM (Association of Young Modern Farmers), MAISON DU PAYSAN, FNPS-Benin (National Federation of Soybean Producers). This multi-stakeholder organization ensures effective implementation of the project as close as possible to the beneficiaries, while strengthening the capacities of national professional organizations. ProCIVA was co-financed by the Swiss Cooperation (SDC) for the period 2018-2021.

Ongoing activities

Although most of the activities initially funded by GIZ under the GICs in Benin have ended, some initiatives are continuing or are in the finalization phase.

One of the main activities still in progress is **the installation and operation of a paddy processing and storage complex in silos.**

In the soybean sector, the **"group input purchase credit"** financing mechanism, developed in collaboration with UNCPS, PROCIVA and FECECAM, continues to be implemented. This mechanism is now considered the flagship financing mechanism of the UNCPS. In addition, some of the innovations introduced by the VICs continue to be implemented and disseminated by local partners and beneficiaries. For example, the dissemination of Good Agricultural Practices (GAP), the Intensive Rice Farming System (SRI), and the use of urea coated with neem oil continues in various regions of the country. In the specific case of soybeans, training on good agricultural practices and technical production itineraries continues to be provided, using the **"pool of skills"** formed by ProCIVA. In addition, efforts are underway to expand the digitalization of agricultural services.

Finally, the GIC partner organizations, such as the Rice Farmers' Consultative Council of Benin (CCR-B) and the UNCPS, continue to collaborate with other projects and programs (such as DEFIA/Enabel, PARSAD/Enabel, PRIMA, PADAAM and PADIAP) to further disseminate the innovations and good

⁴ https://www.giz.de/en/downloads/giz2020_en_GIAE_Factsheet_Benin.pdf



practices introduced by the GICs. This approach aims to ensure the sustainability of interventions and maximize their long-term impact on Benin's agricultural sector.

3.1.2 Changes/Impact of GIC

On beneficiaries

Table 1: Benin - overview on beneficiaries.

Beneficiary	Changes	Innovation	Amplitude	Explanation
Rice producers	Improved productivity	BPA, SRI, Neem Oil Coated Urea	3	More than 30% increase in production between 2018 and 2021
Soybean producers	Improved productivity	Inoculum introduction	3	60% increase in production between 2016 and 2020, Yields reduced from 600-700 kg/ha to 1.2-1.5 t/ha
Agricultural producers	Increased revenue	Improved productivity + market access	2	Increased revenue through the combination of improved productivity and market access
Soybean producers	Better access to inputs	Grouped input purchase credit mechanism	3	Access to quality inputs at the right time thanks to the UNCPS-ProCIVA-FECECAM collaboration
Farmers	Management capacity building	FBS Approach	2	Development of an entrepreneurial vision of farms
Cooperatives (Zou)	Improved access to credit	GIC support	2	Better credibility with financial institutions
CCR-B Members	Digital skills development	Kits Atingi	1	1025 out of 62,744 members can access training content via phone without a connection
Local population	Job creation	Installation of processing units	2	Creation of small processing units (rice huskers)
Farmers	Improved resilience	Sustainable agricultural practices + better management	2	Better resistance to climatic and economic shocks
Trained producers	Creation of a relay trainer network	Training of trainers	2	Continuous dissemination of knowledge beyond direct beneficiaries

Amplitude: 1 = low 2 = medium 3 = high

On the GIC partner organizations

Table 2: Benin - overview on GIC partner organizations

Partner Organization	Changes	Innovation	Amplitude	Explanation
CCR-B	Becoming a PO of Excellence	Excellence Producer' Organizations	3	At the beginning of the support, the CCR-B benefited from a diagnostic evaluation which made it possible to identify the points of attention



CCR-B	Access to remunerative paddy markets	Processing and storage of paddy in silos	2	This innovation will improve financial autonomy through the added value induced by paddy processing
CCR-B	Improved Dissemination Approach	Digitalization	1	The atingi kits helped strengthen the digital skills of 1025 producers
UNCPS	Establishment of a financial mechanism	GIC financing mechanism "grouped input purchase credit"	3	Major change allowing easier access to inputs and credit
UNCPS	Creation of a pool of skills	Training of trainers	2	The organization has a group of qualified trainers
UNCPS	Partnership Development	Multi-stakeholder collaboration	2	Strengthening of links with AJAM, FNPS, SOPROCEB, SODECO
DLROPEA	Structuring POs	Good governance practice	3	Transition from the 4-level network (National, departmental, communal and village) to the two-level network
APRM Structures	Capacity building	Material support and training	Not specified	Benefit from computer and rolling stock, internal and external training

Amplitude: 1 = low 2 = medium 3 = high

Cooperation between GIC partner organizations

The GIC have strengthened cooperation between partner organizations in Benin, including:

- In terms of access to inputs and seeds, the UNCPS has developed partnerships with AJAM and FNPS for the supply of seeds. A collaboration has also been established with SODECO, which has a monopoly in Benin for other types of inputs.
- In terms of technical cooperation and infrastructure, the JRC-B has established a partnership with PETKUS for the supply and installation of the silos. It also collaborates with BSF (Bibliothèque Sans Frontières) for the implementation of the Atingi kits and training in their use.
- In the financial field, an important partnership has been developed between UNCPS, ProCIVA and FECECAM for the implementation of the "group input purchase credit" financing mechanism.
- Institutional cooperation has been manifested through the collaboration between the central and decentralized structures of the APRM to accompany and support the activities of ProCIVA in their areas of intervention. There is also a collaboration between FUPRO, DCAIFE and PNOPPA.

To ensure the sustainability of the cooperations, the JRC-B relies on other projects/programs to continue dissemination, including DEFIA/Enabel, PARSAD/Enabel, PRIMA, PADAAM and PADIAP. The continued cooperation with PETKUS is planned for future maintenance, and prospects for continued collaboration with BSF are envisaged to strengthen digitalization. The "group input purchase credit" developed with the UNCPS and FECECAM operates autonomously. Institutional anchoring is ensured by the integration of activities into other programs and collaboration with government structures. A



"skills pool" formed by ProCIVA continues to provide training, while relay producers continue to disseminate knowledge locally. Some innovations such as urea coated with neem oil are naturally diffused.

Innovations promoted by GICs

Technical innovations in soybean production

The introduction of **inoculum** was an important innovation that allowed for a considerable increase in production. This significant improvement was so remarkable that it even allowed Benin to become a soybean exporting country to China and Europe in 2020.

Innovations in the rice sector

In terms of rice, several innovations have been successfully introduced. These include the dissemination of **Good Agricultural Practices (GAP)** and the introduction of the **Intensive Rice Cultivation System (SRI)**. A particularly interesting innovation was the use of **urea coated with neem oil**, which halved the amount of urea used per unit area.

Financing Innovation

An important innovation was the implementation of the "**group input purchase credit**" mechanism developed with UNCPS, ProCIVA and FECECAM. This mechanism, which has become the flagship financing system of the UNCPS, allows producers to access quality inputs at the right time.

Organizational Innovations

The development of the **Farmer Business School (FBS)** approach has been an important innovation that helps producers run their farms like businesses.

Innovation in digitalization

The introduction of **the Atingi kits** represents an important step forward in the digitalization of the agricultural sector. To date, 1025 producers out of 62,744 members of the JRC-B can access training content via their mobile phones, even without an internet connection.

Post-harvest infrastructure

An important innovation being finalized is the installation of a paddy processing and storage complex in silos. This innovation aims to improve access to remunerative markets for producers. The GICs have therefore promoted varied and relevant innovations, with remarkable results. However, despite these successes, several challenges remain.

3.1.3 Lessons learned on successes, failures and challenges

Major successes include the significant improvement in agricultural productivity, with a 60% increase in soybean production and a 30% increase in rice production. Soybean exports to China and Europe in 2020 mark a notable success. The CCR-B has become a PO of excellence, and the UNCPS has developed an innovative financing mechanism with the "grouped input purchase credit". Strengthening entrepreneurial capacities through the FBS and better connection to urban markets have also been achieved. The development of effective sectoral partnerships has contributed to these successes.



Failures identified include low uptake of agricultural mechanization despite obvious needs. Geographical coverage remained incomplete, leaving areas such as Atacora-Donga uncovered. The adoption rate of digitalization has remained low, with only 1025 producers out of 62,744 users of the Atingi kits.

Regarding the persistent challenges, the sustainability of GIZ post-funding remains a major concern, with a withdrawal of ProCIVA considered premature. Difficulties in accessing finance for entrepreneurs remain, and the mobilization of own resources by organizations remains limited. Scaling up innovations and empowering partner organizations financially are significant challenges.

Recommendations from stakeholder interviews suggest planning for a longer transition before the withdrawal of funding, strengthening self-financing mechanisms, and developing more inclusive scaling strategies. It is also recommended to maintain the retraining of the first beneficiaries, to promote international networking and to strengthen the institutional anchoring of innovations.

The GIC in Benin have therefore demonstrated their ability to transform the agricultural sector through relevant technical, organizational and financial innovations. While there have been notable successes, particularly in improving the productivity of the rice and soybean sectors and developing innovative financing mechanisms, challenges remain in terms of sustaining the gains made and scaling up innovations. The experience of the GICs underscores the importance of an integrated approach and a gradual transition to ensure the sustainability of interventions in the agricultural sector.

3.2 Burkina Faso (2014-2024)

3.2.1 Description of the GIC

Objectives of the GIC

The GIC in Burkina Faso (ProCIV) aimed to improve agricultural productivity and strengthen value chains (Grunder *et al.*, 2018). This intervention aligns with national priorities defined in the National Economic and Social Development Program (PNDES), which outlines strategic axes: Axis 2 – developing human capital and Axis 3 – stimulating key sectors for the economy and employment. Under Axis 3, the first strategic objective focuses on agriculture, aiming to sustainably develop a productive and resilient agro-sylvo-pastoral, wildlife, and fisheries sector that is more market-oriented (MEF, 2016).

In Burkina Faso, the GIZ/ProCIV project, supervised by the Ministry of Agriculture, operated from 2014 to 2024 in the regions of South-West, Cascades, Hauts-Bassins, and Boucle du Mouhoun (GIZ, 2021). It collaborated with producers, umbrella organizations of rice and sesame value chains, private companies, the Agricultural Training Center of Matourkou (CAP-M), and the Dreyer Foundation using the following approaches:

- Value Chain Approach: Disseminating market-oriented innovations adapted to local, regional, and international opportunities.
- Public-Private Partnerships (PPP): Identifying and spreading innovations through PPPs and innovation platforms that connect Burkinabe businesses with international players, contributing to the spread of tailored solutions.



- Inclusive Business Models: Promoting trade links between farmers, local traders, and processors, including integrated services (e.g., input provision, pre-financing, consulting services), and ensuring access to markets under competitive and fair conditions.
- Capacity Building for Innovation: Developing capacities through local service providers (local trainers, model farmers, and agricultural advisors) in demonstration fields and knowledge transfer.

Priority value chains

The GIC in Burkina Faso focuses on supporting sesame and rice value chains⁵:

Sesame

Sesame holds substantial economic potential in Burkina Faso, directly and indirectly affecting over 1,500,000 people, according to the Ministry of Agriculture (MARAH). Between 2010 and 2020, national sesame production surged from 87,000 tons to 259,000 tons (APEX, 2019), contributing an average of 1.4% to GDP and 9.6% to the agricultural sector's added value. Sesame exports accounted for 4.88% of total exports during this period. The profitability of sesame farming was 82% for producers, 63.44% for processors, and 34.2% for traders (Ouedraogo, 2023).

The "Sesame" value chain involves various stakeholders organized into groups. In March 2016, the Interprofessional Sesame Association of Burkina Faso (INTERSEB) was established, encompassing the National Union of Sesame Producers (UNAPROSEB), the National Association of Sesame Traders and Exporters (ANASEB), and the Association of Sesame Processors (ATS/B).

Production: In 2020, the number of sesame producers was estimated at approximately 3,000,000 or 45% of agricultural households. Women accounted for around half of the producers and young people aged 18 to 35 for about a third. Average yields varied between 614 kg/ha and 510 kg/ha over the 2010–2020 period. These production results are heavily influenced by climatic conditions, the quality of available seeds, agricultural practices, and variations in soil fertility. The production sector is organized from the village level, with sesame producers' groups, up to the national level. Regionally, there are seven regional sesame producers' unions located in Boucle du Mouhoun, North, Center-West, South-West, Center-East, Cascades, and East. These seven unions are members of the National Union of Sesame Producers of Burkina Faso (UNAPROSEB), established in 2012.

Processing: Actors involved in sesame processing have formed an umbrella organization called the "Association of Sesame Processors" (ATS/B) in 2014. This association includes more than 110 individual associations and/or unions across Burkina Faso, either as individuals or legal entities. On average, each association/cooperative comprises about 100 members.

Marketing: Actors in the sesame marketing sector are grouped under the National Association of Sesame Traders and Exporters of Burkina Faso (ANACESB), created in 2013. ANACESB consists of two umbrella organizations, including the Sesame Exporters' Group of Burkina (GESB) and the Inter-regional Professional Association of Sesame Traders and Exporters (APRICES).

⁵ https://www.giz.de/de/downloads/giz2021_fr_GIAE_Factsheet_Burkina%20Faso.pdf



Rice

At the national level, rice is a cereal that holds a prominent place in the dietary consumption of the population. The demand for rice has been estimated at 840,000 tons per year, compared to an average annual national production of 324,611 tons between 2010 and 2019. Studies project that this national demand could reach 1,500,000 tons by 2025 (Koutou et al., 2021). Despite relative gains in rice production and existing market opportunities, national production covers less than 50% of consumption needs.

Production: Rice is cultivated in two major ecological zones: irrigated plains and lowlands, as well as a less-developed third zone, upland areas. The production is carried out by numerous family farms, grouped under the National Union of Rice Producers of Burkina Faso (UNPRB), established in 2005. Over the past decade, national rice production has increased thanks to expanded cultivation areas, driven by the development of lowlands and irrigated perimeters, along with subsidies for agricultural inputs and equipment provided by the government and its partners following the 2008 food price crisis. Political will is reflected in the presidential initiative "Producing 1 Million Tons of Rice" in 2020-2021 and the second phase of the National Strategy for Rice Development (SNDR II 2021-2030), aimed at increasing rice production to 3 million tons of paddy rice by 2030. The goals are to meet national rice demand and boost actors' incomes based on competitive and sustainable domestic production. Major challenges to rice production include low productivity, unavailability and high cost of inputs, and vulnerability to climate change effects.

Processing: The processing of locally produced rice is carried out by a variety of actors in both the informal and formal sectors. In the informal sector, numerous women, organized or not, process local rice mainly through parboiling techniques. A significant group in this sector is the National Union of Rice Parboilers of Burkina Faso (UNERIZ), established in 2010, supported by small dehulling units scattered across the country. In the formal sector, a few industrial rice milling units of varying sizes and capacities exist, grouped under the National Union of Industrial and Semi-Industrial White Rice Processors of Burkina Faso (UNTR-B), established in 2012.

However, processing units and parboilers face issues such as limited availability of paddy rice, poor quality of processing equipment, low technical performance and specialization of actors, and non-compliance of factories with standard norms. As a result, processed rice is often considered low quality. In addition to supply and quality problems, limited access to financing (equipment credit and working capital) remains a major constraint for processors and parboilers, who need significant credit to pre-finance rice producers.

Distribution/Marketing: Rice distribution is ensured by numerous actors in both the informal and formal sectors. This includes women selling white or parboiled local rice in various markets and many shops contributing to making local rice available to consumers. Some distributors are grouped under the National Association of Rice Traders of Burkina Faso (ANACOR-BF), established in 2013.

Consumption: Local rice consumers in Burkina Faso are represented by the Burkina Faso Consumers League (LCB), established in 1992. All these groups of actors across the segments are brought together under an umbrella organization: the Interprofessional Committee of Rice in Burkina Faso (CIR-B), established in 2001. Studies highlight numerous constraints affecting different segments of the rice value chain, including:



- poor organization of the input supply segment, particularly seed supply, leading to inefficient seed distribution;
- financial constraints faced by actors, including producers and processors, limiting proper financing for production, collection, storage, and processing;
- lack of access to quality equipment for delivering market-standard products;
- poorly organized markets dominated by the informal sector with numerous intermediaries;
- weak contractual links between actors (producers, collectors/processors, input suppliers, financiers), and non-compliance with contract terms when they exist;
- limited knowledge of good agricultural and post-harvest practices, as well as insufficient support services.

3.2.2 Changes/impact of the GIC

On beneficiaries

Adoption of Good Agricultural Practices

The project trained nearly 149,000 producers in good agricultural practices and entrepreneurship, trained more than 3,000 endogenous trainers and the Farmer Business School (FBS) (Bonkougou, 2024). The FBS training enhances the entrepreneurial skills of smallholder farmers for increased and diversified income. Of all those trained by ProCIV in Burkina Faso, 33% were women and 34% were youth.

Job Creation

ProCIV's interventions in Burkina Faso led to the creation of 1,430 direct jobs in agro-food processing, primarily through rice processing units supported by the ProCIV partnership (Bonkougou, 2024). A total of six rice milling units benefited from the partnership with ProCIV, enabling them to develop partnerships and create jobs. Other young people were also engaged in mechanized service provision, equipment maintenance services, and entrepreneurship training.

Increased Productivity and Income of Producers

The project supported the seed sector by setting up a seed cleaning and grading unit to make rice and other seeds available to producers. This initiative was accompanied by training for producers through "Farmers Business School" (FBS) and BuS to foster an entrepreneurial mindset and market orientation. The Good Agricultural Practices (GAP) approach was implemented in collaboration with endogenous trainers to improve land productivity. At the same time, ProCIV partnered with SOFITEX to introduce a climate information service (Moyenga, 2020). In June 2019, 75 agents from SOFITEX and ProCIV were trained in the use of weather forecasts to support about 4,300 producers in western Burkina Faso from June to October 2019. The study showed that 75% of the surveyed producers received daily messages regularly, at the same time each morning. Both producers and supervisory staff agreed on the reliability of the service. Sixty-seven percent of producers used the forecasts to better manage plowing and sowing at the right time (85% of these producers). Producers also noted a 100% reduction in pesticide use frequency, leading to changes in pesticide practices during the season. Access to weather forecasts helped reduce fertilizer and pesticide losses. Eighty-five percent of surveyed producers stated they used the forecasts for effective weeding or hilling. Additionally, effective labor management was noted (83% of producers). Lastly, 82% of producers reported they harvested, dried, and stored at the right time thanks to the weather information.



As a result of ProCIV's intervention, 36,119 producers adopted climate-smart innovations that increased their rice productivity by 93.6% compared to 12% for sesame (Table 3). The incomes of rice producers increased by 84%, and those of sesame producers rose by 122%.

Table 3: Burkina Faso - Impact of ProCIV on the yield and income of producers.

	Initial (2013)		ProCIV Impact (2024)**			
	Initial Yield *	Income (FCFA)	Yield	Rate	Income (FCFA)	Rate
Rice	2 409 kg/ha	6 363	4 663	94%	11 709	84%
Sesame	636 kg/ha	190 690	711	12%	423 332	122%

*Grunder *et al.* (2018) ** Bonkougou, 2024

On the GIC partner organizations

ProCIV has provided support to twelve rice processing plants that maintain supply links with over 13,000 producers through contract farming by providing seeds, fertilizers, and extension services. Additionally, 31 agricultural equipment kits have been made available to rural youth to support the emergence of micro-enterprises offering mechanized agricultural services such as plowing, sowing, harvesting, and threshing.;

The project has established rice paddy processing units to train young agronomists at the national agricultural training school. This pedagogical unit plays a key role in ensuring the sustainability of rice processing expertise and inspires agricultural entrepreneurship in Burkina Faso. The "**processing**" aspect is a thematic area that had not been adequately addressed in the agricultural technician training curricula in Burkina Faso.

ProCIV has supported the Ministry of Agriculture in certifying the national seed system to the standards of the Organisation for Economic Co-operation and Development (OECD) and the International Seed Testing Association (ISTA). In this context, a solar cold room and six solar germination chambers have been installed across five regions of the country.

Additionally, to support entrepreneurs in Small and Medium Enterprises (SMEs), ProCIV, in partnership with the Maison de l'Entreprise du Burkina Faso (MEBF), launched the "« SME Business Training and Coaching Loop »project from 2020 to 2022, an approach developed by GIZ. The goal was to accelerate the development of SMEs by improving sound business management practices, facilitating access to markets and financing, as well as creating new jobs and consolidating existing ones. Furthermore, SMEs will benefit from several training sessions tailored to their needs and receive close support from a business coach or business mentor.

Innovations promoted by the GICs

Table 4: Burkina Faso - Innovations promoted by the GIC's

Innovation	Explanation of status of adoption/scaling
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Contract farming	- ProCIV has succeeded in introducing and developing contract farming in the rice value chain. - Contract farming is now part of agricultural policy, with a contract farming development strategy based on the experience with ProCIV rice mills.
Rice processing units	The ProCIV experience has been adopted and the transformation is strongly supported to develop the rice sector in Burkina Faso. The model has inspired several projects.
Good practices for rice production	Training provided, technicians continue to scale up with new growers in the grower network
Seeds	Introduction of seeds that respond to household consumption demand adopted by outgrowers
Image boxes	Providing image boxes to producers has changed the way we work.
Seed cleaning with mobile units	Established
Rice processing units	The ProCIV experience has been adopted and the transformation is strongly supported to develop the rice sector in Burkina Faso. The model has inspired several projects.

3.2.3 Lessons learned on successes, failures and challenges

Stakeholders' Perception of the Goals and Activities of the GIC

The stakeholders interviewed perceive the objectives and activities of ProCIV through the following points:

- Increasing the income of seed producers and farmers in the rice and sesame value chains by promoting the use of certified seeds from improved, climate-resilient, and high-yielding varieties in the Hauts-Bassins, South-West, Boucle du Mouhoun, and Cascades regions;
- Strengthening the national technical system in terms of skills for monitoring, advisory support, inspection, quality control, and seed certification;
- Building capacity in rice processing techniques and equipment for selected enterprises;
- Training of trainers and farmers in technical pathways and Good Agricultural Practices (GAP) for rice farming, FBS (Farming as a Business), and BUS (Business Skills);
- disseminating tailored solutions in the agricultural and food sectors through technical and organizational innovations along agricultural value chains;
- enhancing food security by increasing agricultural productivity and supporting value chains in the agri-food sectors, particularly by promoting agroecological practices for sustainable food production;
- promoting sustainable agricultural practices: A central goal of GIC is to disseminate innovative and environmentally friendly farming techniques, including agroecological approaches to protect soils, reduce chemical use, and encourage sustainable natural resource management;
- creating jobs and improving incomes: By supporting SMEs and fostering entrepreneurship in the agricultural sector, GIC contributes to job creation, particularly for youth and women. It also aims to increase smallholder farmers' incomes through better valuation of agricultural products;



- strengthening agricultural value chains by providing training, technical services, and market access. GIC also supports the improvement of processing and marketing techniques, enabling farmers to access new markets and increase the added value of their products.
- supporting innovation and digitalization by encouraging green technology innovations and digitizing the agricultural sector. GIC promotes digital tools to improve access to climate information, market prices, and modern farming practices.

Benefits of Collaboration with ProCIV

The benefits of collaboration with ProCIV, as perceived by stakeholders, are summarized below:

- High-performance equipment (seed cleaning and calibration machinery, processed rice, sesame, etc.). The National Union of Seed Producers of Burkina Faso (UNPSB) benefited from several supports, including the acquisition and installation of six seed cleaning units and organizing study tours for experience sharing.
- ProCIV also helped train other producers in good agricultural practices, increasing their income by 84%, enabling access to mechanized agricultural services, and facilitating Burkina Faso's adherence to OECD/ISTA standards, among others.
- Numerous study tours across Africa and the world (Germany, China, Malawi, Tunisia, Benin, Mali ...)
- Technical advice and guidance;
- Promotion of networking, resulting in various partnerships, including public-private partnerships, for establishing local processing units. This supports competitive local rice processing capacities, offering market opportunities for rice producers through contract farming networks (involving over 4,000 producers in the South-West region of Burkina Faso). This aims to establish sustainable contract relationships between producers and processors, known as Contract Farming;
- Establishment of seed cleaning and calibration units to make quality rice and other seeds available to producers;
- Training farmers in FBS and BuS to develop an entrepreneurial mindset and adopt a market-oriented approach;
- Implementation of Good Agricultural Practices (GAP) in collaboration with endogenous trainers to improve land productivity.

Sustainability Actions

The project's actions to ensure the sustainability of its intervention are as follows, according to the understanding of the beneficiaries:

- The project involved technical services through capitalization and experience-sharing workshops, enabling knowledge dissemination and sharing with agricultural directorates. Additionally, trainers within the Ministry were trained to deploy the project's achievements in the field;



- For the private sector, the business and market approach ensures stakeholder interests and thus sustainability. Processors have recognized the value of building win-win relationships with producers over the long term;
- Provision of tools at the end of the project to allow beneficiaries to continue their learning. These tools were handed over to the Ministry of Agriculture for further dissemination in agricultural settings.
- Through various studies, the project has drawn policymakers' attention to:
 - the need for a legal framework for pesticide management and targeted crop protection methods promoted by the GIC program;
 - developing policies to promote integrated pest management, encourage research, and inform and sensitize stakeholders on pesticide risks;
 - The importance of further supporting the training of state extension agents, notably through the development of endogenous trainers as part of an integrated pest management program;
 - increasing the dissemination of information about authorized local input suppliers and pesticides for targeted crops.

Lessons from the Project's Activities

Key lessons learned from the implementation of GIC activities include:

- Capacity building for all stakeholder groups in the various links of the value chains involved;
- Involving direct beneficiaries in implementing activities ensures sustainable results;
- Improving the quality of rice processing and packaging of national rice using optical sorters and aromatic rice varieties.

New challenges for stakeholders

Following ProCIV's intervention in Burkina Faso, the few stakeholders interviewed highlighted the new challenges they face:

- The challenge of ensuring a sufficient supply of paddy rice to meet the growing needs of consumers;
- The challenge of sustaining the PROCIV approach, which involves addressing difficulties encountered by stakeholders and fostering collaborative problem-solving.

According to the partners interviewed, the program's activities were highly instructive. The intervention impacted all links in the two value chains (rice and sesame). They noted improvements in the availability and quality of raw materials (paddy rice and sesame) for processing and/or commercialization. Thanks to the emphasis on capacity building through training sessions, study tours, and support for acquiring efficient tools, most stakeholders are confident that activities continue despite the program's conclusion. Many have set new goals to further develop their activities, inspired by the project's intervention, particularly, most beneficiaries established and maintained strong relationships with financial institutions to support their activities, and these relationships continue to



grow. Service operators providing support for production and processing (service providers) have been developed, indicating the sustainability of the project's actions. The private sector was significantly strengthened for both value chains, contributing to the creation of rural jobs and adding value to agricultural products in the project's intervention areas.

3.3 Cameroon (2014-2024)

3.3.1 Description of the GIC

In Cameroon, more than 60% of the population is involved in agricultural activities. The agricultural sector is the main driver of economic growth in rural areas. This sector contributes more than 25% to the gross domestic product in the country. Local agriculture also plays a central role in supplying food for the 27.9 million inhabitants of Cameroon. The agricultural sector has great potential due to the high domestic and foreign demand for food, livestock and fisheries as well as favourable geographical and agro ecological conditions for a wide variety of production.

Notwithstanding the contribution of the agricultural sector to the country's economy, the rural areas are characterized by a poverty rate of 56.8% against 8.9% in urban areas. Farmers operate within a traditional production system. Access to land remains a major challenge for both young people and women just like access to credits and loans. Furthermore, small farms and other actors in the agricultural and food sector have limited access to innovations that would increase their productivity and improve their incomes.

Agricultural research as well as actors in the different value chains have developed innovations aimed at improving agro-pastoral production, processing and marketing. In collaboration with MINADER and MINEPIA, the civil society, the private sector and producers, the GIC (ProCISA) was aimed at promoting these innovations that can contribute to sustainable rural development. Topics such as entrepreneurship, organizational development, production techniques and post-harvest management were addressed. To facilitate knowledge transfer between innovators and users, emphasis was placed on the improvement of didactic materials, the development of demonstration plots and disseminating innovations through green agricultural schools. Cross-cutting topics such as climate change, digitalization and youth employment were also taken into account in the implementation of these activities.

Objectives of the GIC

1. To improve the incomes of smallholder farms as well as employment and the regional supply of foodstuff through agricultural and agri-food innovations in Cameroon.
2. Relevant for the contribution of food security and improvement of income generation by the producers as well as job creation



Priority value chains

Three value chains were supported in Cameroon: potato, traditional (backyard) poultry and cocoa⁶.

Potato

Potato cultivation is essentially performed in high-altitude areas, but is also gradually developing in the Adamawa region. Due to the economic importance of the value chain both for the national market and for ex-port, the state has set itself the strategic goal of doubling annual potato production to 900,000t by 2030.

The GIC contributed to the development of the sub-sector by introducing innovations and supporting the creation of a multi-stakeholder platform to strengthen the links between the private and public sectors.

Traditional (backyard) Poultry

Poultry farming in Cameroon includes both traditional and modern production systems. Traditional poultry production is of considerable importance for the economy, representing 60% of the national poultry sector and contributing 45% to the national coverage of animal protein needs. Since 2005, the Government reduced the importation of “frozen” chicken in a bid to protect consumers’ health.

The GIC facilitated the introduction of innovations related to animal health, nutrition, habitat and reproduction.

Cocoa

Cameroon is the world’s 5th largest cocoa producing country. Cultivated in 8 regions, mainly in the South West, Littoral, West and the Centre regions over an area of 400,000 hectares, cocoa is an important source of income for the producers due to its high market prices.

The GIC contributed to increasing productivity in the sector by introducing innovations in relation with planting materials, cultivation techniques, post-harvest management (fermentation/drying) and processing.

In Cameroon, the GIC (ProCISA) was aimed at improving the incomes of smallholder farms as well as employment and the regional supply of foodstuff through agricultural and agri-food innovations implemented by the project. The project was part of the Special Initiative “One World No Hunger” of the German Federal Ministry for Economic Cooperation and Development (BMZ). The Cameroon component of this initiative was part of the global project "Green Innovation Centers for the Agricultural and Food Sector" (ProCISA), which was implemented in 16 countries. Supportive services were provided by the partner organisations listed in this report.

National partners of the GIC

Ministry of Agriculture and Rural Development (MINADER)

- Department of Research and Quality Control (DRCQ)
- Department of Agricultural Production (DOPA)
- Centre for Agricultural Machinery and Mechanisation (CENEMA)

⁶ <https://www.giz.de/en/downloads/giz2023-en-Cameroon-Factsheet-2020.pdf>



- Projet D'Appui au Développement au Cacao (PADCACAO)

Ministry of Livestock and Animal Husbandry (MINEPIA)

- Department of Animal Health and Veterinary medicine
- Regional Delegation of Livestock and Animal Husbandry

Research Institutes and Universities

- Institute of Agricultural Research for Development (IRAD)
- International Institute of Tropical Agriculture (IITA)
- Faculty of Agronomy and Agricultural Sciences (FASA),

Private Sector

- Ordre National des Vétérinaire du Cameroun (ONVC)
- Laboratoire National Vétérinaire du Cameroun (LANAVET)
- Société de Développement du Cacao du Cameroun
- National Cocoa and Coffee Board (ONCC)
- Conseil Interprofessionnel du Cacao et du Café (CICC)

Training Centres

- Centre Polyvalente de Formation (CPF) de Mbouo – (Potato and Poultry)
- Centre de Formation Agropastoral de Noun (CEFAN) – (Poultry)
- African Institute for Economic and Social Development (INADES FORMATION) CAMEROON – (Poultry)
- Regional College of Agriculture Bambili – (Potato)

23 Cooperatives

L'Association National des Semenciers et L'Association national des producteurs de pomme de terre de consommation

Foreign Institutions

- International Potato Centre (CIP)
- INVELCO
- GRIMME
- EuroPlant

Ongoing activities

- Production of rooted apical cuttings (RAC)
- Production of potato mini tubers
- Train farmers on the setting up and management of screen houses.
- Training seed farmers on the use of rooted apical cuttings in replacement of the classic tubers

These activities are being carried out by the Institute of Agricultural Research for Development (IRAD) Cameroon. A public research institute. With the support of the project a Tissue Culture laboratory was set up in IRAD Bambui in Bamenda, North West Region where the production of rooted apical cutting



(RAC) is ongoing. These plantlets are distributed to trained potato seed multipliers in the various cooperatives put in place by the project in the North West and West regions of the Country.

IRAD is also involved in the production of potato mini tubers for distribution to potato seed producers. Training of farmers and setting up screen houses is ongoing by IRAD and potato cooperatives to upscale the production of potato seeds in the country.

3.3.2 Changes/ impact of the GIC

On beneficiaries

Table 5: Cameroon - overview on beneficiaries.

Beneficiary	Changes/Impacts	Innovation	Observed or expected?	Magnitude	Explanation
Farmers	Improved Production skills Entrepreneurship skills	Good agricultural practices Farmers business School Machinery (tiller) Incubator Vaccination CBS (Cooperative Business School) Professional training	Yield/ Productivity Income Mortality rate of day old chick	2 2 3	
Potato seed producer	Increase quality of potato seeds produced	Rooted apical cuttings and minitubers	Seed producers are producing seeds in screen houses	1	Number of seed producers still small compared to demand
		-Cool seed storage	Better seed storage conditions with a longer shelf life	1	Only one cool store exist for the entire Region
Ware potato producers	Improvement in potato yields	Application of Good Agricultural practices by ware producers	Training of farmers by staff and farmers to farmer exchange	1	Prevailing socio political crises
		Increase irrigated farms (Gravity, solar and water pumps)	Increase in offseason potato production	2	Farmers exploit the different options as the different options workable in their farm sites
Local poultry producers	Use of new sources of food in feeding local poultry	Use of herbs as main food	Observed	3	
	Housing of local poultry	It was first done free range but now the farmers house their birds	Observed	2	



Cocoa producers	Increased yield of cocoa from new performing varieties	Improved planting material	Observed	2	
	Training of cocoa producers FBS (Farmers Business School) GAP (Good Agricultural Practices) Nutrition, Leadership, Cooperative Development	Sustainable production techniques	Observed	2	
	Improved processing and transformation	Solar drying	Observed	3	

(rating: 1 "low" 2 "medium" 3 "high")

On the GIC partner organisations

Table 6: Cameroon - overview on GIC partner organizations.

GIC Partner	Changes/Impacts	Innovation	Observed or expected?	Magnitude	Explanation
Private sector	Sales and Expansion of market	SME LOOP approach Campagne de vaccination communautaire (utilisation des agents de vaccination)	Employment Chiffre d'affaire (sales)	2 1-2	SME loop is a 9 month program form enterprise with theoretical training and individual coach on the identify challenges of enterprise. He rating is different for the different value chain. Is medium on poultry producer, high on veterinary stations but low for ware potatoes
Training centers (CPF, CRA, CEFAN and	Capacité de management et de suivi des subventions	Good agricultural practices Farmers business School	Put the training on curriculum	1	L'intégration des modules de formations dans le curricula par



INADES Formation)	Capacité techniques thématiques des formateurs des centres Plateaux techniques (matériel de bureau, de formation, matériel didactique)	Vaccination CBS			les centres de formation reste un défis car encore assez coûteux pour les producteurs
Decentralised government technical services (MINADER and MINEPIA)	Compétence technique acquis Meilleurs suivis des producteurs Matériel de sensibilisation amélioré	Good agricultural practices Farmers business School Vaccination	Yield/Productivity Income Mortality rate of day old chick	2 2 3	
Micro finance institutions	Meilleures connaissances des itinéraires techniques de production ; Meilleures connaissances des chaines de valeur Augmentation de la demande en fonds par les producteurs	Good agricultural practices		1	Certains institutions de microfinance ont développé et sont en train de tester des produits financiers adapté ; Certains Institutions de microfinances ont recruté des agronomes pour analyser et suivre les projets agricoles

(rating: 1 "low" 2 "medium" 3 "high")

Cooperation between GIC partner organisations

- Trained personnel and equip offices of key organizations involved in the potato value chain e.g personnel and offices of DRCQ, IRAD; Supported the establishment of inter-branch organizations for seed and ware potato production which are functional bringing together seed producers and ware potato producers; producing a new potato strategy document for the country.
- Inclusive capacity building of partners by training their permanent staffs;
- Training material (image boxes) left with lead farmers to continuous training in farmers business schools (FBS) that were set up.
- Appui en matériel et outils de formation ;
- Appui et formation des services techniques déconcentrés du MINEPIA (formation en approches de vaccination, formation des CCZV (et des directions régionales), appui en outils de sensibilisation et de formation.



- Information et Technologie (IT) dans les curricula de formation
- Offre des cours modulaire

Innovations promoted by the GIC

Potato value chain

Table 7: Cameroon - innovations promoted by the GIC (potato).

Innovation	Status of adoption and scaling up	Rate of adoption
Good Agricultural Practices (GAP) for Seed potato production (Improved varieties, Rooted Apical cuttings technology, mini tubers)	Seed producers as well as ware potato farmers are practicing these innovations at different level	10 seed producer targeted. 2 screen houses operational and 8 seed farmers are using rooted apical cutting technology More than 70 tons of seeds (six varieties) imported Registration of these six varieties in the national catalogue
Good agricultural practices for ware potato production	Many farmers are practicing many of the elements in GAP for ware potato production	Estimated 7,000 producers trained and practicing element of GAP for ware potato production
Irrigation in offseason production	Many farmers are using different options proposed: solar pumps, motto pumps, gravity irrigations	Estimated 300 producers practicing offseason irrigation
Rooted Apical Cuttings (RAC) technology	The technology has completely been adopted by the Institute of Agricultural Research for Development (IRAD). The institute and trained seed producers now produce seeds using the technology year in and out.	100%
Small-scale mechanization	Introduction of machinery for planting, tilling and harvesting	4 machines imported and used at the level of the cooperatives (harvesters and planters) 20 power tillers imported

Poultry value chain

Table 8: Cameroon - innovations promoted by the GIC (poultry).

Innovation	Status of adoption and scaling up	Rate of adoption
Good agricultural practices (GAP)	60-70% of the farmers trained directly in the Farmer Field Schools have adopted the best practice modules. Scale-up is carried out on a factual basis (advice) between farmers who have been directly	60%



	trained and those who have not taken part in training courses or those who are new to the activity. Some managers of private structures have also started poultry production.	
Farmers Business School (FBS)	Producers trained directly in the framework of farmer field schools have partially adopted this approach. The challenge of this approach is that it integrates several speculations during training, as well as household aspects. The training takes place over 5 half-days, which is very restrictive for producers. The FBS approach is also supported by a certificate. Only trainers who have undergone 12 days of training are able to train producers.	20%
Vaccination endogène (intégrée)	All producers and facilitators, plus trainers and CCZV, have received training in the village vaccinator approach and the veterinary practice. Producers systematically request the vaccine from veterinary practices.	60%
Housing	Well adopted.	60% adoption (about 1600 producers) 40 carpenters trained in the production of an improved chicken coop model
Feeding	Very good adoption	75% adoption (about 2100 producers) 10 feed mixers introduced
Reproduction	Average adoption	48% adoption (about 1300 producers) 15 incubators using different energy sources introduced
Marketing	Fair adoption	45% adoption (about 1100 producers)
Animal health	20 veterinary offices created; 56,278 chickens vaccinated; 2,872 households reached	

Cocoa value chain

Table 9: Cameroon - innovations promoted by the GIC (cocoa).

Innovations	Achievements
Improved planting materials	Performing varieties in multiplication
Sustainable production techniques	48,465 producers trained on the following themes: - FBS (Farmer Business School) - GAP (Good agricultural practices) - Nutrition, Leadership, Cooperative Development
Fermentation	Adaptation of cascade fermentation boxes Built fermentation boxes (capacity: 1 ton)
Solar drying	06 solar dryers constructed in: - Centre Region: Ngomedzap, Ayos - South West Region: Bafia and Konye
Transformation	02 cocoa transformation units with semi-industrial equipment



Sustainability

Potato value chain

Table 10: Cameroon - sustainability overview (potato).

Seed production	Storage	Irrigation	Mechanization	Training on GAP and FBS
Valorization of the Rooted Apical Cutting (RAC) technology and production of minitubers	Provision of different storage facilities to reduce post-harvest losses (Diffused Light Stores (DLS) and Solar powered stores made of local materials	Training and use of sprinkler sprayers for irrigation	Provision of modern machines (for example potato planter and harvesters) to reduce drudgery	Appropriation of methods and tools by Training Centres
Existence of screen houses for seed production (both public and private)	Managers and committee members of cooperatives trained in management and maintenance of stores	Diffusion of economic models	Training on the use and maintenance of equipment	Willingness of farmers to pay for training on improved technologies
A pool of potato seed producers trained and structured into organized, functional and certified cooperatives in different production basins			Diffusion of economic models	Integration of GAPs and FBS into the training curricula of professional producers of seed and ware potato
Diffusion of economic models for seed production				

Poultry value chain

Table 11: Cameroon - sustainability overview (poultry).

Vaccination against New Castle Disease	Feed mixer, crushers and incubators	Training on GAP, FBS and ATVET
Local production of vaccines by LANAVET (a local partner)	Upgrade and functionality of equipment	Appropriation of methods and tools by Training Centres
Adoption of L2VAX and the village vaccinator approach by the project.	Willingness of farmers to pay for training and use of modern feed mixers to increase their capacity	Willingness of farmers to pay for training on improved technologies
Local facilitators carryout vaccination of birds in the villages reducing the rate of mortality	Implementation of a rentals-sales system for livestock farmers	Integration of GAP and FBS into the training curricula of professional producers for day old chicks
	Increasing the acquisition of incubators by trained livestock owners	



3.3.3 Lessons learned on successes, failures and challenges

Successes

The private sector has played a key role in the quality of the results obtained. It is one of the players in a value chain that needs to be integrated right from the start of value chain development projects via public-private partnerships.

- Involvement of government officials in the implementation of VIC projects;
- Sustainable development of agricultural practices;
- The creation of cooperatives;
- Inclusion of women and young people;
- Awareness on the economic value of local poultry among the producers
- Available knowledge on this activity which is traditionally part of the communities
- Closer attention to the sector by MINEPIA and also collaboration with producers
- Good level of strengthening of actors as well as links between actors in the potato value chain
- Farmers highly interest in some of the potato varieties introduced
- Training in GAP for seed and ware potato producers was quite successful
- Innovations on local poultry production were welcome and implemented by most farmer.
- Many people have embraced local fowls production as a profitable and sustainable activity.

Challenges

- High cost of innovation hinder widespread adoption. E.g. power tillers costing 4 million and with spare accessories unavailable on the local market were difficult to adopt and replicate (as was the case for the GRIMME machine, a mini abattoir).
- Mechanization remains a challenge.
- The immunization system's dependence on ocular vaccine also remains a challenge. Local production is still costly compared with injectable vaccine. It is currently packaged in 100 doses, making it difficult for veterinary practices to sell.
- Limited availability of local day-old chicks and lack of control over the local breed.
- Slowness in embracing innovations by farmers especially on reproduction and marketing due to long-practiced traditional methods.
- Limited means to adequately cover all the potato basins in terms of training
- Farmers sometimes expected material support which could not be offered by the project.
- Proper timing of the activities of the project sometimes is a real challenge. Some activities were not well planned as the seasons were longed passed for their implementation. This went a long way to slow the speed of adoption of some of the technologies.



- Farmers not willing to vaccinate their birds due to high cost of vaccine 50fcfa/bird
- The insecurity in the North West Region of Cameroon could not allow funding of local poultry farmers

3.4 Côte d'Ivoire (2018 – 2026)

3.4.1 Description of the GIC

Agriculture plays an important role in Côte d'Ivoire's economy. Côte d'Ivoire's impressive achievements on the world stage are reflected in key statistics. As the top producer of cocoa beans globally for decades, the country meets 40% of the world's cocoa needs. Côte d'Ivoire also holds the title of Africa's third-largest coffee producer, is the global leader in cashew production, leads Africa in kola nut output, and ranks third in worldwide rubber production.

These achievements are attributed to structural and institutional reforms initiated by the government in agriculture. Key reforms include restructuring certain sectors, strengthening governance and resource transparency, boosting processing capacities for raw materials, and enhancing farmers' purchasing power, which has driven productivity growth.

To improve farmers' living conditions, the government aims to accelerate the processing of agricultural raw materials to enhance the value chain for specific products and modernize agriculture through the National Agricultural Investment Program (PNIA II), valued at 11,905 billion CFA francs for the period from 2018 to 2025.⁷

Objectives of the GIC

The main objective of ProCIV is to encourage the adoption of innovations in agriculture and food production, focusing on cocoa, cassava, and plantain. More specifically, the project aims to increase small farmers' incomes through income diversification, create employment opportunities, and improve regional food supply in targeted rural areas.

The GIC project focuses on three selected value chains: cocoa, cassava, and plantain.⁸ These farms are supported primarily through advisory, training, and logistical services, enabling them to apply innovations in inputs, techniques, knowledge, and organization to boost productivity, income, and long-term climate resilience. The project beneficiaries include cocoa cooperatives, women's groups engaged in cassava processing, women's groups in plantain production, and agribusiness companies.

The ProCIV initiative aims to promote five themes, including sustainable cocoa farming without deforestation, diversification of crops and producers' incomes, local processing (primary and secondary) and marketing, and innovations in the cocoa, cassava and plantain sectors. This initiative further aims to strengthen the agricultural sector by fostering collaboration among stakeholders at both national and international levels.

⁷ <https://www.gouv.ci/actualite-article.php?recordID=15049&d=4>

⁸ <https://www.giz.de/en/worldwide/78984.html>, <https://www.giz.de/en/downloads/giz2023-en-Cote-dIvoire-Factsheet-2021.pdf>



Priority value chains

Cocoa

Côte d'Ivoire, the world's largest cocoa producer, relies on cocoa farming to support nearly 7 million people. Cocoa production from January 1 to December 31, 2022, reached 2.4 million tons, up from 2.2 million tons in 2021, marking a 5.85% increase. Cocoa producers received an estimated cumulative income of 2,038 billion CFA francs, with an average guaranteed farm-gate price of 852 CFA francs per kilogram for the 2021-2022 season, an increase of 7.29%.

Investments made from January to December 31, 2022, amounted to 35 billion CFA francs, while levies collected over the same period amounted to 22.35 billion CFA francs. These investments primarily focused on purchasing burlap bags for coffee and cocoa collection, along with sustainability initiatives to support the cocoa and coffee industries.

However, half of the smallholder farmers in the sector live below the poverty line. To address this disparity, the GIC project is being implemented to increase farmers' incomes by promoting innovations throughout the value chain. Additionally, since extensive cocoa farming contributes to deforestation, the project advocates for environmental protection alternatives that enable intensified production without expanding cultivated areas.

Cassava and plantain

Cassava and plantain are staple foods widely consumed in Côte d'Ivoire. However, the processing of these staple crops into value-added products remains limited, preventing farmers in these sectors from earning a decent livelihood. The project aims to increase farmers' incomes by promoting innovative farming techniques and the processing of derivative products within these two value chains.

There are three main regional hubs: Abidjan, San Pedro, and Abengourou. These regional sites are key cocoa-producing areas aligned with themes of zero deforestation and agricultural landscape improvement.

Two incubators in Yamoussoukro et à Gagnoa: The selection of Yamoussoukro and Gagnoa is strategic. In Yamoussoukro, an incubator at the Institut National Polytechnique Houphouët Boigny enables the involvement of students, researchers, and faculty, while also allowing producers to process cocoa beans that are typically not marketable during the minor harvest. Gagnoa was chosen due to ANADER's role as an implementation partner, with a professional training center that provides an additional opportunity for ProCIV.

National partners of the GIC

The institutional foundation of the GIC project was established with the involvement of both national and international institutions and organizations, with GIZ as the main implementing agency.

- Ministry of State, Ministry of Agriculture and Rural Development (ME-MINADER)
- Coffee and Cocoa Council
- Ministry of Water and Forests
- International Centre for Research in Agroforestry (ICRAF)



- French Agricultural Research Centre for International Development (CIRAD)
- Cultivating New Frontiers in Agriculture (CNFA)
- International Cocoa Initiative
- Sustainable Cocoa Forum
- Regional Councils
- Municipalities
- Youth Employment Agency
- National Agency for Rural Development Support (ANADER)
- Other representatives from the public and private sectors, as well as civil society, including cooperatives
- Incubators via the Institut National Polytechnique Houphouët-Boigny and INCUB'IVOIR

The involvement of these institutions reflects GIZ's commitment to ensuring the sustainability of actions taken under the ProCIV project. The long-term impact of the project's achievements will ultimately rest with the local beneficiaries primarily the producers who are expected to become active participants in improving their own living conditions and well-being.

Ongoing activities

Ongoing activities are managed by cooperatives, incubators, and ANADER under the supervision of GIZ.

- Adding value to cocoa pods by increasing producer income and further improving productivity
- Producing edible mushrooms, vinegar, and combustible briquettes from cocoa-based substrates
- Supporting plantain and cassava entrepreneurs in securing funding and accessing competitive markets
- Training cocoa, cassava, and plantain producers in innovative agricultural techniques and in adding value to derivative products from their crops

3.4.2 GIC Changes/impacts

The information documented in this report concerns the GIC in Côte d'Ivoire, and the results are directly due to the interventions of the GIC.

On beneficiaries

In Côte d'Ivoire, the ProCIV has contributed to bringing about changes in the practices of the beneficiaries, with a significant scale, and innovations are being well adopted by the stakeholders involved:

- Raising awareness about the transformation of cocoa and its by-products beyond the commercialization of cocoa beans.
- Improving the living conditions of producers through increased yields thanks to the introduction of innovations in their agricultural practices.
- Changing eating habits through the consumption of mushrooms.



- Adapting to climate change and changing behavior regarding the use of wood, thus helping to reduce deforestation: the production of charcoal and fuel briquettes from cocoa pods.
- Fostering an entrepreneurial spirit by improving the skills of producers.
- Developing income-generating activities (IGAs) for the women in the households of the producers.
- Empowering producers in the rational management of sales of their products.
- Empowering women involved in cassava cultivation through the provision of grinders for transforming cassava into processed products.
- Reducing the physical burden of agricultural work, increasing production, and subsequently improving the income of women involved in cassava cultivation through their equipment with peelers, presses, and grinders.
- Encouraging producers to express their training needs, especially for mushroom production.
- Creating jobs through SMEs in the agricultural sector, including agricultural entrepreneurs, trainers, and stakeholders specialized in transforming cocoa beans into cosmetic products, chocolate, and roasted beans.
- Formalizing the activities of several producers, leading to an improvement in their living conditions

On the GIC partner organization

- Involvement of GIZ in the implementation of the ProCIV (meetings and technical advice, operationalization, etc.).

Cooperation between GIC partner organizations

- Establishment of a monitoring committee.
- Training of trainers to continue and disseminate training in cooperatives, incubators, and SMEs.
- Establishment of an association of cocoa processing SMEs to ensure the continuity of the achievements of the GIC.
- Development of training modules through ANADER.

Innovations promoted by the GIC

- Adoption of innovations through the initiation of technical advice aimed at organizing and planning activities to improve the living conditions of producers.
- Forest restoration through a participatory approach involving communities and regional councils (forest dialogue platform).
- Diversification of producers' income through the valorization of derived by-products: mushroom production using cocoa substrates, commercialization of cocoa waste used to produce compost for plantation fertilization, and transformation of cocoa juice into vinegar.
- Support for value chain actors in the transformation of agricultural products through innovative practices.
- Production in compliance with environmental and sanitary standards.
- Working to make agricultural actors resilient.



- Encouraging producers to see themselves as economic operators.
- Establishment of incubators for the transformation of cocoa by-products and the training of entrepreneurs and cooperatives on various topics.

3.4.3 Lessons learned on successes, failures and challenges

Successes

- Improvement of producers' living conditions through the diversification of their agricultural activities.
- Dissemination of information following the symposium on the benefits of cocoa.
- Proximity-based cassava transformation thanks to the grinders provided to women.
- Installation of transformation chains for cooperatives (pilot units through cassava production and transformation chains).
- Production of briquettes by producers.
- Establishment of dialogue platforms with Regional Councils (San Pedro, Abengourou, Soubré), municipalities, and institutional leaders in various regions regarding forest preservation and protection.
- Creation of jobs for young men and women.
- Combating deforestation.
- As with any executed project, the implementation of the GIC allows lessons to be drawn in terms of management, direction, and coordination of activities.

Failures and challenges

- Mechanization of the agricultural sector.
- Adoption of sustainable political strategies for the improvement and mechanization of agricultural value chains.
- Improvement/optimization of support for agricultural sector actors.
- Provision of logistical resources to facilitate access to the field.
- Strengthening producers' capacities over the long term.
- Provision of funding, prototyping units based on specific needs.
- Increase in the number of support structures for producers.
- Promotion and recognition of agricultural labor.
- Access to markets.
- Ensuring the sustainability of ongoing activities after the end of the project.
- Active participation of cooperatives and enterprises benefiting from the implementation of innovations.
- Involvement of other partners and beneficiaries (increasing the number of partners and beneficiaries).



3.5 Ghana (2014-2021)

3.5.1 Description of the GIC

Ghana has significant natural potential for agricultural production. Agriculture is a key sector of the country's economy accounting for approximately 20% of the nation's GDP in 2016. The country has a large rural population (45% of the total population), with half of the nation's labour force being employed by the agricultural sector. Over 90% of all farms are smaller than two hectares with low productivity due to challenges such as: poor farmers' access to inputs including seeds and fertilizer, low mechanisation and financing, while post-harvest losses can be as high as 37% of total production (GIZ, 2017). The sector remains predominantly rain-fed subsistence farming, with 80% of total agricultural output relying on basic technology (FAO, 2015). Hence, much of the potential is still under-utilized. Consequently, agriculture in Ghana needs to apply innovations to improve the income of farmers, and increase the employment opportunities in the agricultural and food sector as well as the regional supply of food. Links between the actors along the value chain need to be strengthened.

Objectives of the GIC

The GIC aims to boost smallholder farmer productivity and improve the whole value chain to maximize farmers' benefits. In Ghana specifically, the GIC sought to:

- attain food sufficiency and enhance farm-based practical activities.
- provide critical inputs in relation to the seed production sector
- reduce post-harvest losses and increase farm incomes and employment

Towards the objectives, the following activities have been undertaken / realized:

- Carried out the implementation of GIC's core field activities, training of farmers in GAPs for rice and maize, training of farmers in Farmer Business School, agro-input dealers, aggregators, rice millers etc) and training of other value chain actors including production of training materials.
- Establishment of demonstration plots; assisted in data collection; implementation of GIC's Innovation.
- Registration of Legon Rice 1 (new improved rice variety)

According to GIZ (2017) innovations introduced in smallholder farm businesses and up- and down-stream agribusinesses in selected rural regions improved incomes in smallholder farming enterprises, employment and regional food supply.

Priority value chains

The GIC in Ghana focused its activities on the maize and rice value chains in the Brong Ahafo, Ashanti, Eastern and Volta Regions. Maize is Ghana's most important domestic cereal crop, followed by rice – although Ghana remains a net importer of rice as domestic production cannot keep pace with demand.

Maize is produced in all of Ghana's regions with 70% of the production received from five regions (Brong Ahafo, Eastern, Ashanti, Central and Northern). It is grown predominantly by smallholder



farmers for consumption with some surplus sold. Maize is marketed through a network of traders in local and regional markets. Larger wholesalers also operate at a regional and national level. Unlike maize, rice is a relatively new crop in Ghana and the largest rice growing region is Volta, followed by the Northern Region then Upper East, Ashanti and Eastern. Rice is predominantly grown as a cash crop by smallholder farmers. The marketing of rice is similar to that of maize: local traders buy from farmers and sell to regional and national wholesalers (GIZ, 2017).

GICs sought to empower small-holder farmers by introducing improved farming techniques and innovations to increase their crop yield and overall productivity. Beyond training farmers on these techniques, GIC also established demonstration plots within/near the beneficiary communities to assist farmers with practical application of the theoretical innovative techniques introduced during training. These demonstration fields were set up for farmers to practise and translate the different innovations they learnt including usage of certified seed varieties, optimizing inputs, adopting proper plant spacing, and increasing plant populations.

National partners of the GIC

The GIC worked with both the political and implementing partners through well-established partnership agreements with clear obligations, roles and responsibilities to achieve its objectives as provided in the foregoing.

GIC in Ghana was implemented in cooperation with the Ministry of Food and Agriculture (MoFA). It also worked together with the regional and district administrations for agriculture and the main sectoral umbrella organizations, including:

- Ghana Grains Council (GGC)
- Ghana Rice Inter-Professional Body (GRIB)
- Grains and Legumes Development Board (GLDB).
- Council for Scientific and Industrial Research (CSIR)
- Public Procurement Authority (PPA)
- Africa Development Bank (AfDB)
- Agriculture and Finance Consultants (AFC)

A team of the consultancy company, AFC (Agriculture & Finance Consultants), was responsible for technical implementation, in-field practical training of farmers as well as strengthening selected stakeholder organizations (GIZ, 2017). Existing Farmer Training Institutes in Wenchi, Brong Ahafo Region and Adidome, Volta Region, were upgraded to serve as central training hubs and facilitated demonstration and exchange among all value chain actors.

Some of major roles played by the partners included: capacity building of farmers and other value chain actors on Good Agricultural Practices (GAP) including pest and pesticide management, implementing GIC activities and undertaking monitoring and evaluation activities, providing technical specifications for the procurement of seed cleaners and maize shellers, training of and provision of solar driers of grains and standardization of grains for marketing with the introduction of weighing scales.



Ongoing activities

Currently, there are no on-going GIC activities in Ghana. However, on conclusion of GIC project activities in 2017, Ghana Grains Council sought to collaborate with AGRA to implement the Aflatoxin policy and also with the Plant Protection and Regulatory Services of the Ministry of Food and Agriculture (MOFA) which in turn sought to collaborate with Centre of Agric Bioscience International (CABI). The Grains and Legumes Development Board, in turn sought to work with MOFA.

3.5.2 Changes/ impact of the Green Innovation Centres

The following section highlights the changes/impacts realized as a result of the implementation of GIC activities from the perspectives of ultimate beneficiaries and partner organizations. The innovations introduced have led to varying positive impacts such as increased farmer knowledge, adoption of better seed varieties, increased crop production, and increased income. Generally, the magnitude of these impacts has been high.

The main beneficiaries of the GIC activities in Ghana were smallholder grain farmers, rice mills and community warehouses. Other intended beneficiaries were the Grains and Legumes Development Board (GLDB) and cooperative society members.

The following section highlights the changes/impacts realized as a result of the implementation of GIC activities from the perspectives partner organizations.

On beneficiaries

All actors along the maize and rice value chains were intended beneficiaries. However, Table 12 summarises the changes/impacts of the innovations on a category of selected actors along the value chains.

Table 12: Ghana - group beneficiary accounts.

Beneficiary	Changes/Impacts	Innovation	Observed or expected?	Magnitude	Explanation
Smallholder farmers	Increased rice yields and quality output (paddy or milled rice)	Use of simple equipment like drum seeders, prowlors Owl for bird scaring in the rice sector	Observed	3	Farmers training on GAPs
	Wide multiplication of the Legon Rice 1 variety for production	The rice variety Ex- Baika was registered to Legon Rice 1	Expected	3	N/A
Rice millers	✓ Rice millers equipped with skills ✓ Improved rice milling	Millers' awareness and use of rice mill graders and color sorters.	Observed	3	Improved milled product and high head recovery rate



	infrastructure such as addition of graders				
Seed growers	✓ Quality seed production. ✓ Reduce production cost	New machinery	Observed	3	Good quality seed
Community warehouses	Improved drying of grains	Hybrid dryer balloon	Observed	3	Increased farmers' preference for solar dryer balloon.

Increased productivity among farmers from application of innovations has led to increased food security, household incomes and better nutrition. Through capacity building of farmers including adoption of Integrated Pest Management (IPM), standardisation for efficient marketing have led farmers to adopt market-oriented agricultural production as opposed to subsistence-oriented farming.

On the GIC partner organization

The partner organizations reported realizing a clear understanding of the needs and demand for innovations given peculiar circumstances of value chain actors. Partners were involved in capacity building (training, provision of information to value chain actors on access to inputs such as pesticides, solar driers etc). Table 13 summarises the specific innovations and its impact on partner organisations.

Table 13: Ghana - impacts of innovations on GIC partner organizations.

Changes/Impacts	Innovation	Observed or expected?	Magnitude	Explanation
Increase in crop yields	IPM	Crops yield increased	2	
		Wrong use of pesticide reduced		
Group training rather than individual farmers organized	Training	Improved grains quality for aggregators to gather.	3	Provided adequate training for farmers to ensure quality of grains post-harvest period.



Development of farmer cooperatives encouraged	Formation of farmer cooperatives	Linked non-cooperative farmers to aggregators to access ready markets after harvest.	3	Farmers motivated to register with Ghana Grains Council/Cooperatives in order to benefit from GIC interventions and assured aggregators/ready market.
Increased funding to support mandate and activities of partner organisations	Better Funding/Logistics	Improved sharing of information	3	Received funding and logistical support to enhance training and awareness creation activities.

(rating: 1 "low" 2 "medium" 3 "high")

Cooperation between GIC partner organizations

The Green Innovation Centre worked hand in hand with governmental partners such as Ministry of Food and Agriculture at National, Regional and District level. It also worked with other organizations. For instance, it worked closely with CSIR on the issue of varietal registration. To contribute sustainably to realized project objectives, the GIC implementing partners and beneficiaries undertook the following: etc.

Actions taken by GIC implementation partner(s) include:

- Registration of Rice Variety (Legon 1)
- Put up mechanisms for continued collaboration with some key stakeholders like Ghana Rice Inter-Professional Body etc
- GIC encouraged the beneficiaries to join credible associations. For example, the commodity exchange platform is available and if farmers' grains meet the right quality, then they could store in the established warehouses and be linked to an aggregator or processor thereby providing ready markets.
- Introduction of solar and balloon driers for grains

Actions taken by GIC beneficiaries include:

- Adoption of some Good Agricultural Practices and other innovations along the rice and maize value chains.
- Ensured that the grants given were used for the intended purposes and well maintained after usage.
- Receive continuous training as well as follow up trainings resulting from their membership with the Ghana Grains Council.

Innovations promoted by the GIC

GIC activities promoted and scaled-up several innovations in the various value chains. Table 14 summarises the key innovations that were promoted and scaled up in the various value chains.



Table 14: Ghana - Innovations and their status of adoption/scaling-up.

Innovation	Explanation of status of adoption/scaling
GAPs	Adoption of Good Agricultural Practices led to increased yield and quality products both paddy and milled rice.
Improved milling facilities	Through Good Processing Practice trainings, some millers upgraded their milling facilities to improve the quality of their products
Registration, multiplication and increased use of improved rice varieties.	Registration, multiplication of Legon Rice 1, resulted in wide multiplication resulting from demonstration activities implemented by GIC.
Integrated Pest Management	Well adopted because it's simple
Seed inputs	Most farmers prefer to use improved seed varieties to ensure increase yields.
Weighing scale	Most farmers use the weighing scale to ensure standardization.
Hybrid dryer balloon	Farmers prefer to dry grains in dryer balloon to ensure quality of grains which is required by the aggregators/processors.
Moisture meters	Moisture meters are used to check moisture content in grains to ensure quality.

Use of hybrid dryer balloon, moisture meters, weighing scales and improved milling facilities resulted in increased rice outputs. More innovations on improved seed inputs and technologies such as GAP and 1PM coupled with training of farmers, providing them with the necessary funding and encouraging them to join corporative societies. This in turn increased knowledge base of farmers resulting in improved yields. The magnitude of these impacts has been high due to adoption of the innovations.

3.5.3 Lessons learned and recommendations

Undertaking the activities of the GIC with the partners, led to realization of some successes, notable among them:

- Laid down rules and regulations on how the GIC grants were used and therefore proper utilization of project funds
- Reach of many targeted regions/farmers,
- Provision of formal and practical training on farming activities across the actors of the value chains
- Creation of awareness on standardization due to availability of weighing scales.
- Increased capacity of value chain actors leading to achievement of project objectives
- Collaboration with many relevant partners; worked with existing Agricultural structures in Ghana and tried to mainstream its activities into the traditional Ministry of Food and Agriculture
- contributed to maize and rice yield increases in the implementing regions; leaving behind a legacy of some cohesive FBOs upon which other projects are building their work, a few apex bodies (Ho- West Rice Farmers Association) which were naturally established



- enabled GRIB to establish a mechanization centre at Asetuare, the registration and multiplication of the ex-baika rice variety to Legon Rice 1, among others

Despite the successes, the following were notable challenges:

- inadequate fueling of vehicles/funding,
- high cost of fuel for gas balloon dryers which in turn became a disincentive for farmers on their use
- relatively short project implementation period
- lack of interest by some of the implementing partners.

3.6 Kenya (2014-2023)

3.6.1 Description of the GIC

Objectives of the GIC

Even though agriculture is the most important sector of the Kenyan economy – it contributes the largest portion to the country's GDP – many of the farmers are small holders and practice farming mainly to feed their own families. Young people are not attracted to work or invest in the sector and women traditionally play a minor role when it comes to decision-making or owning an agribusiness. The objectives of the GIC in Kenya were:

- Increase income and productivity of at least 100,000 dairy and sweet potato farmers by 30%
- Create 2,000 jobs especially for women and youths in the up- and downstream industries of the two value chains
- Improve regional access to nutritious food
- Promote women and youth with the project support activities (GIZ, 2024).

Priority value chains

GIC Kenya supports the development of the sweet potato and dairy value chains in the counties of Siaya, Bungoma, Kakamega and Homa Bay in Western Kenya and Nyandarua in Central Kenya with the goal to foster a sustainable agricultural development, especially for youth and women. Small-holder farmers are being trained in innovative agricultural technologies (e.g. climate-smart production methods) and financial literacy, and producer and marketing groups are being strengthened through capacity building and organisational support. Across all activities, GIC Kenya aims at increasing its outreach in remote rural areas by applying ICT-based instruments and using media channels like radio and SMS. Cross-cutting themes included animal health and environmental conservation.

National partners of the GIC

The GICs worked with both the political and implementing partners through well-established partnership agreements with clear obligations, roles and responsibilities to achieve its objectives as provided in the foregoing.

Political Partner: Ministry of Agriculture, Livestock, Fisheries and Cooperatives



Implementing partners: National and international research institutions such as International Livestock Research Institute (ILRI), Kenyan Agriculture and Livestock Research Organization (KALRO), KEVAVAPI (Kenya Veterinary Vaccines Production Institute, Dairy cooperatives, Bukura Agricultural College, Agriculture Improvement Support Service (AGRISS), Anglican Development Service (ADS), CARE International, Non-Governmental Organizations such as Community Research in Environment and Development Initiatives (CREADIS), Rural Energy and Food Security Organization (REFSO), Ugunja Community Research Centre (UCRC) and Agriculture Improvement Support Services (AGRISS), Welthungerhilfe (WHH), County Governments (Bungoma, Kakamega, Siaya, Homa Bay and Nyandarua)

Some of major roles played by the partners include: capacity building of farmers and value chain actors; creation and strengthening of market linkages; provision of seed (potato vines, fodder grasses and shrubs) and irrigation facilities; and soil testing services.

Ongoing activities

Currently, there are no on-going GIC activities in Kenya. Even though, most of the organizations are willing to continue with the GIC related-activities by undertaking capacity building of value chain actors and technology advancements. They want to cooperate with different stakeholders such as the Ministry of Agriculture, the county governments and other organizations such as cooperatives.

3.6.2 Changes/ impact of the GIC

The following section highlights the changes/impacts realized as a result of the implementation of GIC activities from the perspectives partner organizations.

On beneficiaries

Increased productivity among farmers from application of innovations has led to increased food security, household incomes and better nutrition. Through capacity building and creation /strengthening of market linkages farmers and in particular, women and youth are now empowered. Through training of farmers and linkages to markets, farmers are adopting market-oriented agricultural production as opposed to subsistence-oriented farming.

On the GIC partner organizations

The partner organizations reported realizing a clear understanding of the needs and demand for innovations given farmer circumstances. Involvement of female technical team in trainings was another change realized by partners involved in training.



Cooperation between GIC partner organizations

Synergies obtained by working together led to observed benefits such as creation of jobs, increased knowledge capacity, lowered production costs and post-harvest losses leading to improved food security. Some of the strategies undertaken to ensure sustainability of project activities include:

- Capacity building (through training) of value chain actors
- Engaging farmers in agribusiness activities and linking them to markets
- Strengthening of farmers associations to influence decisions in pricing, regulation and policy
- Strengthening of cooperative associations
- Formation of lead farmer structures to oversee the production of sweet potato vines and fodder
- Trained and equip seed multipliers with starter seed
- Establishment of demonstration site to choose/obtain the best sweet potato varieties
- Extension transferred from partner organizations to the Ministry of Agriculture in the Counties

Innovations promoted by the GIC

- Fodder intercrops (Napier grass/desmodium; Vetch/Oats) and promotion of protein fodders (case of Lucerne) for livestock
- Home-made ration formulations
- Calf rearing and housing
- East Cost Fever vaccinations using “KALRO -Muguga Cocktail technology”
- Irrigation materials to allow seed to root
- Value addition equipment to produce various sweet potato products to extend shelf-life and increase marketability
- Sweet potato varieties especially the Orange Fleshed Sweet Potato rich in iron for the elderly, children and the sick
- Cold storage technologies to minimize post-harvest losses

Some of the challenges that were realized while promoting the innovations include: farmer dependence on rainfed agriculture, seed recycling, poor markets, delayed funding and short project implementation period.

3.6.3 Lessons learned and recommendations

- No single innovation dissemination approach is adequate. This was demonstrated by the various methods used: farmer to farmer exchange visits; demonstrations; use of ICT-based messaging applications; use and provision of training manuals/charts/pictorials, brochures and fliers.
- Innovation adoption requires concerted effort from all value chain actors including provision of political partners; Ministry of Agriculture for regulation, supporting policy and conducive environment.



- Despite the successes realized, both the ultimate beneficiaries and partner organizations faced some challenges such as farmer dependence on rainfed agriculture, seed recycling, poor markets, delayed funding and short project implementation period.

3.7 Malawi (2014-2024)

3.7.1 Description of the GIC

Agriculture in Malawi is and remains a significant sector for economic growth and development. The agriculture sector contributes about 26% to the Gross Domestic Product (GDP), employs around 83% of the population, and is the main source of livelihood especially for the majority rural households; and provides up to 80% of the national export earnings. Agricultural productivity and commercialization features prominently as one of the three key pillars in the Country's main development framework, Malawi 2063 Agenda. Agriculture is also considered as a foundation of Malawi's economy, in the National Export Strategy II (2020-2025).

Malawi's agriculture sector comprises four key categories, namely: (i) cash crops, such as tobacco, sugar, tea, and cotton, (ii) food crops, e.g. maize, rice, sorghum, cassava, and groundnuts, (iii) livestock and poultry, and (iv) fisheries.

However, the agriculture sector is faced with a number of challenges. Notable challenges include: vulnerability to adverse effects of climate change, disruption of agricultural inputs (e.g. fertilizers) supply chains and output export markets, largely caused by external shocks (e.g. wars), resulting in high input prices and limited access to lucrative foreign output markets, poor early warning systems (for informed agricultural decision-making and disaster preparedness), low agricultural diversification, low and poor mechanization, lack of or inadequate local supply of appropriate agricultural inputs (e.g. fertilizers and quality seed), inadequate knowledge of good farming practices and insufficient entrepreneurial skills, particularly among the small-scale farmers, and limited access to formal markets.

Therefore, appropriate agricultural innovations, skills and expertise are key to sustaining and boosting the growth and development of the sector, and maximizing its contribution to the Country's socio-economic and environmental growth and sustenance.

Objectives of the GIC

As per the literature, the main or overall goal of the GIC was to contribute to the sustainable rural development in selected rural regions of Malawi through the promotion of innovations in the agricultural and food sector.

This was to be achieved by collaborating with partners to strengthen structures to identify, implement, and disseminate climate-resilient innovations.

The following were the reported main goals of the GIC, from the perspective of the various (5) interviewed stakeholders, and depending on their mandate or areas of interest:

- To contribute to accelerating the Government's development goals (especially as espoused in the Malawi 2063 Agenda).



- To empower cassava farmers through commercialization (by processing).
- Promoting Good Agricultural Practices (GAP) for Soybeans, Cassava and Groundnuts, through Climate Smart Agriculture (CSA).
- Promoting business and entrepreneurship among farmers through Farmer Business Schools (FBS), as a training package.
- To promote business groups, i.e. Micro, Small and Medium Enterprises (MSMEs) by training and coaching using the MSME Business Training and Coaching Loop (training package), including supporting private sector in fertilizer production.
- To capacitate rural entrepreneurs in forming organizations (Small and Medium Enterprises-SMEs) in order to grow economically, through enhancement of their production and introduction to business.
- To promote sustainable food systems for cassava
- To promote legume (soybeans and groundnuts) technologies, which have not yet been released and adopted by famers.

Priority value chains

The GIC package of Malawi focused on three value chains or agricultural commodities, namely groundnuts, soybeans, and cassava.⁹

The overall justification for selecting these value chains is that their development is in line with the government priorities; especially the diversification agenda, from maize being the major food crop, and tobacco which has been and continues to be the dominant cash crop. This is important in order to sustain household livelihoods and ensuring a more resilient agricultural system. Sustainable income from tobacco is not guaranteed in the longer-term due to a decline in global demand, for health reasons, as a result of the anti-smoking campaign¹⁰. However, the rationale for selecting these specific value chains include:

Soybeans: is one of the country's key alternative cash crops to tobacco. Soybeans' productivity and area under production, are increasing due to government policies to promote value addition, domestic use, and crop diversification. Therefore, the crop has immense potential as a source of Malawi's foreign exchange earnings. And comparing with maize, soybeans is currently more lucrative: for example, the average profit for cultivating soybeans per acre was US\$585.70 while that for maize was US\$385.80 for Malawi (Mtisunge B. Mngoli, 2022). Besides the potential for increased national and household incomes, Soybeans also offers the potential and benefits for improving soil fertility and household nutrition. However, the value chain still has some challenges, such as limited access to quality seeds, low awareness on existence of huge markets (African Continental Free Trade Area-AfCFTA), bureaucracy in obtaining export permits (processing costs and time), and low productivity and production.

Groundnuts: in Malawi, groundnuts are a very important crop for national and household incomes (especially in rural areas), as a food crop, as well as enhancement of soil fertility. It is actually the most important legume crop in terms of area planted and quantity (volume) produced: topping the list of

⁹ https://www.giz.de/en/downloads/giz2021_en_GIAE_Factsheet_Malawi.pdf

¹⁰ Anti-tobacco crusade is increasing within the context of the World Health Organization's Framework Convention on Tobacco Control



oilseeds in terms of production volume. It is mostly grown by small-scale farmers (about 93%) all over the Country, of which more than 50% are women.

From around the 1990s groundnuts production and markets, especially the export markets, greatly reduced. Among the factors for this down-turn in production, include: adverse impacts of climate change, labour constraints, limited access to credit facilities and improved seed, low adoption rates of improved technologies, and poor agronomic practices. Some of the factors that contributed to market decline are the collapse of the Agricultural Development and Marketing Corporation (which provided guaranteed ready local market and facilitated exports), and the domination of markets by vendors, resulting in very low and exploitative prices, including significant price fluctuations.

However, the groundnuts value chain is re-emerging, largely due to decline of the tobacco industry, which had been the dominant income resource. The Government has designed various policies and programmes aimed at boosting the production and marketing of high-quality groundnuts (with lower levels of aflatoxin).

Cassava: Besides maize, cassava is also a staple food crop for about 30-40% of the country's population. It is also an industrial crop, whose demand is currently increasing due to its benefits. However, the value chain remains largely undeveloped and faces a number of challenges, e.g. postharvest losses, thereby necessitating the need for boosting the sub-sector, in order to maximize its socio-economic and environmental benefits.

National partners of the GIC

Implementation of the GIC activities involved collaborations with various partners, from different stakeholder categories, i.e. public sector, private sector, farmers' organizations/cooperatives, Academic and research institutions, and Non-Governmental Organizations (NGOs). Thus, covering stakeholder partners at micro, macro and meso levels. Magomero Community Development College, Rural Market Development Trust (RUMARK), and the Ministry of Agriculture's Department of Agriculture Research Services (DARS), implemented various activities in all the three crops: but RUMARK and Magomero also included access to finance (with record-keeping and financial management) and Natural resources (Agroecology/agro-forestry), respectively.

Ongoing Activities

After the end of the GIZ-GIC Project in March 2024, there has been no ongoing GIC activities among the interviewed partners.

3.7.2 Changes or Impact of the GIC

In Malawi the GIC package primarily promoted eight innovations, i.e. three global innovations and five domestic innovations. The global innovations were: MSME Business Training and Coaching Loop¹¹,

¹¹ Also referred to as SME Loop



Good Agriculture Practices (GAP)¹², and the Farmer Business School (FBS). On the other hand, the country-specific innovations included: inoculant, aflatoxin management, natural resources management and climate change¹³, seed multiplication, and access to finance, agricultural inputs and markets (through structured value chain relations).

On Beneficiaries

The table below summarises the reported observed or expected changes/impacts on the beneficiaries, resulting from the implementation of GIC activities or innovations.

¹² In the implementation of this innovation, Farmer Field Schools were used as a platform for the provision of extension services, participatory identification of innovations, promotion of dissemination and adoption by small-scale farmers.

¹³ This innovation was part of the interventions due to the prevalent climate change effects and biological conditions.



Table 15: Malawi - observed or expected changes of GIC innovations on beneficiaries.

Beneficiary	Changes/Impacts	Innovation	Observed or Expected?	Magnitude	Explanation
Farmers	Increased productivity, production and agricultural knowledge	✓ Training in GAP ✓ Training in Agro-food processing (value-addition)	Observed	3	Farmers have increased agricultural knowledge (GAP and Agro-food processing) through the trained Extension Workers
	Increased sales	Enhanced Agro-processing (by the College)	Observed	3	The College buys farmers' produce, as an off-taker, for processing, at an attractive price
	Increase in request for varieties or technologies that were demonstrated	Demonstrations of new research technologies (<i>Natural Resources Management and Climate Change, and Seed multiplication</i>)			Not able to confidently tell the magnitude of the change/impact since there has been no physical follow-up on or assessment of farmers using the new technologies
Farmers and Cooperatives	Do not know				Respondent/Interviewee has not directly met the beneficiaries
Cassava Growers	Understanding fine details of processing (commercialization process)	Empowering cassava growers through commercialization (<i>MSME Business Training and Coaching Loop and/or FBS</i>)	Observed	2	
	Exposure of stakeholders to the cassava sub-sector		Observed	3	
Extension Workers	Trained Extension Workers readily getting employed in Government and NGOs	Enhanced training curricula (<i>MSME Business Training and Coaching Loop and/or FBS</i>)	Observed	3	Trained Ministry of Trade's staff to revamp Cooperatives, through financial literacy and increased sales
Women and Youth Groups	Increased business knowledge and profitability	Enhanced training curricula (SME Loop)	Observed	3	Trained women and youth have set up value-addition enterprises
Agro-dealers	Finding easier ways of accessing money for business	One-to-one mentorship entrepreneurial training (<i>FBS; and MSME Business Training and Coaching Loop</i>)	Observed	3	



	Improved record-keeping and financial management	Training in record-keeping and financial management, using a Computer Application/Software (<i>MSME Business Training and Coaching Loop</i>)	Observed and Expected		Previously record-keeping was poor
	Improved dealing and relationship with farmers, including increased input demand from farmers	Introduction of two agricultural inputs (Inoculum and Aflasafe) for increasing farmers' production, through boosting growth and reduction of Aflatoxins (<i>Inoculum and Aflatoxin Management</i>)	Observed	3	Inoculum and Aflasafe have become best-selling agricultural inputs by Agro-dealers.
Traders	Trading in a formal way with regularised businesses (following regulations)	Formal entrepreneurship training (<i>MSME Business Training and Coaching Loop</i>)	Observed		Previously they were working in isolation
	Finding better and good markets, and improved quality of products for sale	Formal entrepreneurship training, leading to formalized trading/business (<i>MSME Business Training and Coaching Loop; Aflatoxin Management; and Access to Finance, Agricultural Inputs and Markets</i>)	Observed		✓ Now able to trade in formal markets, including international markets (previously unable to find good markets) ✓ Now exporting more due to increased product quality through the use of Aflasafe (reduced Aflatoxins)

Note: The innovations written in *italics* is as per interpretation or understanding of the authors. (rating: 1 "low" 2 "medium" 3 "high")



On the GIC partner organizations

Table 16 shows the summary of the observed or expected changes/impacts due to GIC interventions or innovations, on the GIC Partners, as reported by the interviewed respondents.

Table 16: Malawi - observed or expected changes of GIC innovations on partner organizations.

Changes/Impacts	Innovation	Observed or Expected?	Magnitude	Explanation
Enhanced operations through material support		Observed	3	The partner institution has been provided with some equipment and motor vehicles
Enhanced operations through logistical support		Observed	2	GIC was bearing logistical costs for holding certain events by the partner institution, e.g. bearing the cost for venues when holding policy review meetings/workshops
Enhanced operations through capacity-building		Observed	1	
Promoting aggregation or commercialization as an industry (through cooperatives)	Commercialization of the Cassava industry (<i>MSME Business Training and Coaching Loop; and Seed Multiplication</i>)	Observed	2	- Commercialization of the Cassava industry has been minimal because GIC has been promoting individual processing instead of groups/Cooperatives - GlZ-GIC had not been consulting the local partners on what activities to undertake: instead, the implemented activities were those already identified at Project design (and imposed on the local partners)
The College has been transformed, leading to winning of business contracts with other partners, e.g. FAO and World bank	Capacity-building of staff (Management and Lecturers) on how to run the College and practical courses in GIC	Observed	3	Capacity-building has led to the change of the business model
Increased income generation	- Capacity-building of staff (Management and Lecturers) on how to run the College and practical courses in GIC. - Introduction and use of Agroecology practices on	Observed	3	Bidding and winning business contracts in collaboration with other partners, e.g. FAO and World Bank



	College Farms/ Orchards (<i>GAP; and Natural Resources Management and Climate Change</i>)			
Increased demand/enrolment for training courses	Development of enriched training Curriculum in Agro-food processing, up to Diploma level (<i>FBS; GAP; and MSME Business Training and Coaching Loop</i>)	Observed	3	- Offering short- and long-term training in Agro-food processing at Certificate and Diploma levels. - Getting requests from various institutions (Government and NGOs) for training of their staff - Indirectly trained 3,800 farmers, through the training of Extension Workers, women groups (30,000 women) and 6,000 youths, in Agro-food processing (through FBS) and GAP.
Improvement in training efficiency and results	Restructuring of training materials	Observed and Expected	3	A Consultant was hired and paid by GIZ-GIC to restructure/improve the training materials
Introduced a new way of conducting business, which has shortened the hours of training Agro-dealers	Mentorship or coaching on a one-to-one basis (<i>MSME Business Training and Coaching Loop</i>)	Observed	3	
Enhanced and efficient cassava research	Micro-propagation of cassava (<i>Seed Multiplication; GAP; and Natural Resources Management and Climate Change</i>)	Observed	3	
Conducting continuous or all-year-round research activities for cassava and other crops	Installation of irrigation system (<i>GAP; and Natural Resources Management and Climate Change</i>)	Observed and Expected	3	Research is now being undertaken throughout the year by using irrigation for water supply: not depending on rain
Enhanced training of farmers and extension staff	Development of training manuals for soybeans, groundnuts and cassava	Observed	2	
Increased uptake of the so far released varieties	Scaling up of technologies	Observed	3	
Use of appropriate cassava varieties for different areas/regions	Mapping cassava varieties in different geographical areas for seed multiplication	Observed	2	

Note: The innovations written in *italics* is as per interpretation or understanding of the authors. (rating: 1 "low" 2 "medium" 3 "high")



Cooperation between GIC partner organisations

After the end of the GIC Project (GIZ-funded activities), three (60%) out of the five interviewed partners reported that they have continued its cooperation with other GIC partners. Cooperation has been in various ways, notably in:

- knowledge-sharing, using own local networks.
- Preparation and submission of joint funding proposals; and
- Generation and dissemination of information to various stakeholders, through extension services, on the GIC promoted value chains and innovations.

From the Project literature, it is reported that the GIZ-GIC together with the implementing partners and stakeholders, developed and implemented a sustainability strategy roadmap so as to ensure successful integration and anchoring of innovations. Stakeholder workshops were used in this process, as a means of collaborating with and engaging partners in: selecting innovations, identification of structures and resources, and strengthening of the selected value chains' individual and institutional capacities and competencies, so as to ensure ownership and continuity after the end of Project support.

Several respondents reported that an exit strategy was put in place by GIZ-GIC and that the following measures have been taken:

- That the partner institution was capacitated by GIZ in preparation for the end of the project, through training in the developed enhanced curricula (FBS, Agro-food processing etc.). Even after the end of the GIZ support 1,700 youths under the Ministry of Labour were earmarked for training by the College.
- Before the end of the Project, GIZ-GIC had asked partners to request for any they needed support for continuation of GIC innovations or activities.
- GIZ-GIC left all the training materials, such as Handbooks, with the partner institution, for continued engagement with beneficiaries.

Other respondents indicated that there was no exit strategy put in place for continued interventions, and/or no proper exit strategy was in place, noting that:

- There had been no good collaboration between GIZ-GIC and partner throughout the whole project process, i.e. from design, implementation and exit.
- GIZ-GIC did not even communicate the end-time (date) of Project, but just advised the partner not to request for more funding from GIC for activities.
- Very few local experts were included in key positions of the Project implementation structure, but rather more of foreign experts. Thus, there has been little or no knowledge and skills transfer, at the end of the Project, for continuity of relevant expertise.
- Predetermined activities by GIZ-GIC were imposed on local partners for implementation, instead of engaging local partners in the identification of appropriate activities.

GIC seems to have had no common engagement and collaboration approach with all its partners. It particularly appears that the major Country stakeholder, i.e. government institutions, had not been fully engaged throughout the whole Project cycle. Thus, the Government may not have the expected enthusiasm to sustain and scale-up the GIC innovations, in other geographical areas of the Country; and may also not have the motivation to encourage non-state actors to adopt and scale-up the innovations. This is likely to negatively affect sustainability of GIC interventions.



Innovations promoted by the GIC

Not all innovations promoted by the GIC have been adopted and scaled up. The rate of adoption and extent of scaling up also vary among the promoted innovations, for various reasons. The table below shows the top 3 to 5 innovations promoted by the GIC, for each partner, and the reasons for adoption and/or scaling-up, including the extent of adoption or scaling-up, as reported by the interviewed respondents.

Table 17: Malawi - top five innovations adopted and scaled-up and reasons for adoption and scaling-up.

Innovation	Explanation of status of adoption/scaling
Seed multiplication by local farmers	Most local farmers are growing cassava for seed (cuttings)
Training using FBS	- Offering hands-on training - Increased financial literacy - Revamped Cooperatives
Training in GAP	- Increased farmer productivity and production - Technical backstopping is provided by Community Development Assistants (trained Extension staff), after training.
Value-addition (Agro-food processing)	- Trained women and youths have set up value-addition enterprises - Increased sales and profitability - Technical backstopping is provided by Community Development Assistants, after training
Using a Computer Application (software) for record-keeping	- Using the Software Application even on Smart phones - The adoption rate reduced when the Software Company (developer) in Germany went bankrupt. - Now the concept has been introduced locally with seven (7) Apps
Development of training manuals for soybeans and groundnuts	- The so far released varieties of soybeans and groundnuts have been adopted - Scaling up of technologies
Conducting demonstrations for newly released varieties	

3.7.3 Lessons learned on successes, failures and challenges

A number of lessons, with regard to successes, failures and challenges, have been learnt from the implementation of GIC interventions, in Malawi. The study brought out the following lessons:

Collaboration and Coordination: collaboration and engagement in the execution of the GIC Project has not been the same among all the GIC partners. Some partners had not been engaged throughout the whole project cycle, i.e. from design to the end. Information-sharing had been poor, full and



discrimination in engagement and information-sharing among the different GIC partners. Good coordination enhances good working relationships in achieving the set targets and objectives.

Implementation challenges: The project document was appreciated; however, the implementation results were not consistent with the rather good content of the Document (different results on the ground). The interest of key stakeholders is to see and ensure that the project interventions and results satisfy the intended beneficiaries; and this would motivate the government to scale-up the interventions to other geographical areas.

Sustainability challenges: The project formulation process or approach did not actively, fully and equitably engage or involve all key local stakeholders, from start to end. Few local experts were included in the project implementation structure for knowledge and skills transfer: but rather more foreign experts occupied key project positions.

Networking and Work Relationships: GIC's work relationship with local partners, with regard to knowledge and technical exposure, and practicability of interventions is commendable. Networking with other GIC implementing partners has facilitated easy and quick learning or knowledge sharing among partners.

GIZ-GIC had not been flexible to adjust to what was obtaining on the ground, thus failure to achieve some intended goals or targets.

Innovations are learning points: GIC interventions have led to increased development of varieties, and efficient and effective ways of disseminating technologies to farmers, e.g. through demonstrations (no longer solely depending on extension staff). Demonstrations have directly linked researchers with farmers, by getting direct feedback from farmers, e.g. feedback on how and why technologies are adopted or appreciated.

In view of the above, the following are recommended:

1. There is need for consistent collaboration throughout the whole project cycle (start to end).
2. Sustainability is key and, therefore, involvement of local stakeholders in the planning/design and implementation stages is important for success of the project and sustainability of activities and results, through capacity-building, and in ensuring that the project's goals/objectives are in line with the Government's development programmes.
 - Local experts should also be included in the project implementation team's key positions, for knowledge and skills transfer.
 - Partners should build-in a sustainability strategy for continued interventions at the end of project support.
3. Already identified activities (by foreign experts) should not be imposed on local partners for implementation; instead, local expert partners should be engaged in the identification of appropriate activities, in order to achieve desirable results and impact.
 - Development partners should use a bottom-up approach in the implementation of projects (listen from local partners on what to do and what can work).



3.8 Mali (2014-2024)

3.8.1 Description of the GIC

Mali's economy is mainly based on agriculture which contributes to GDP at about 36% and employs 80% of the labor force. Agriculture is practiced by households whose main purpose is to satisfy their food needs. The country of Mali has enormous potentialities for developing its' agriculture to satisfy internal needs and increase exports. Ecosystem degradation and climate change due to human pressure on natural resources have conducted decrease in agricultural land productivity in all regions in the world, one of the direct consequences is low agricultural production.

In Mali, the GIC promotes the rice, potato/market gardening and mango value chains with a particular focus on young people and women. Its intervention areas are the regions of Kayes, Koulikoro, Sikasso, Ségou and Mopti. This choice of these value chains is based on their contribution to the national and sub-regional economy.

In Mali, the GIC programs are part of the Agriculture Innovation and Nutritional Food Security (AGRISAN) component. They are placed directly under the supervision of the Ministry of Agriculture. Field activities are carried out by research institutions (LTA/IER), higher education institutions (IPR/IFRA), technical services of the Ministry of Agriculture (DNA, DNGR, DRA etc.), NGOs (WHH and DVV), financing institutions (Agrifinance, BNDA, Kafo jiguine and NGOs (WHH).

Objectives of the GIC

The main objective of the GIC program is the transformation of agriculture both technically and politically. The expected results are:

- supplying farms with food, improving their productivity by 30% and improving their income by 30%;
- creating jobs and improving the turnover of agricultural businesses;
- improving governance in the sectors and advocating for the transformation of agriculture.

To achieve these results, the following activities were undertaken in all relevant value chains:

- Improving access to inputs, equipment, markets and training for farms;
- Improving access to raw materials, equipment, markets and training for businesses;
- Advocacy, capacity building, training and support for the governance of inter-professions.

The beneficiaries are:

- the decentralized technical services of the State (DRA, Offices, NGOs);
- seed companies, equipment manufacturers, rice mills, processors, rice parboilers;
- rice, mango, potato interprofessions.

The implementation strategies consisted of:

- disseminating innovations and their scaling up through the strategy of diffusion by controlled growth by diffusion by grafting;



- training of trainers;
- training of a pool of trainers;
- the farmer field school; and
- radio communications.

To do this, tools/supports have been developed to accompany training and activities by translating these supports and tools into the local language; by making microfilms; by establishing showcase plots and by organizing inter-farmer visits and open days.

Priority value chains

In Mali, the rice, potato, mango and fish chains were selected as part of the green innovation centers.

The GIC program has made interventions in the rice sector. At the production level, the project has helped producers in the area of intensive rice cultivation (SRI) in the rice offices of Ségou and Mopti. The SRI program was piloted by the extension division of the national directorate of agriculture. According to information collected from DNA agents, the SRI program began in the years 2018 and ended in July 2023. The activities consisted of training producers on new production techniques such as deep placement of urea, the use of organic manure, the use of plowing and irrigation equipment.

The GIC program has worked extensively on the parboiling of the 180 rice kit with the LTA food technology laboratory. Its role was to train the beneficiaries of the 180 kits on good hygiene practices and good practices for parboiling rice with the 180 kit.

The GIC program made interventions in the potato value chain as well as in the mango value chain with the aim of increasing the productivity and income of the beneficiaries. These interventions consisted of supporting the actors of these value chains in production, marketing and processing techniques.

National partners of the GIC

The GIC program collaborated with different structures and organizations in the rural development sector. These structures and organizations include the national directorate, small and medium-sized enterprises, the national directorate of vocational training, rural engineering, private centers (Zamblala private center, private center in Kayes, Father Michael, IPR), HSL, Agrofinance (all other GIZ projects), PASSIP IRRIGAR, PASSIP, DNA and the Samako agricultural equipment experimentation center, the Minister of Agriculture, CPASFD, AP, /SFD, interprofessions of different value chains (mango, rice, fish, etc.), agricultural development offices, market gardeners and rice growers in the Beledougou and Baguineda area, financing institutions (kafo jigine, Soro jiriwa so, Baobab, BNDA), IFRIZ, IPR, interprofession and LTA / IER and NGOs (WHH and DVV).

Technical services of the Ministry of Agriculture

The National Directorate of Agriculture (DNA) plans all the activities of the GIC within it. It is the unit that pilots all the activities of the GIC. The GIC granted funding to the DNA for the development of the system of intensive rice cultivation (SRI). In the same funding, the DNA benefited from a training package for producers. These trainings had as objectives the strengthening of the capacities of the



beneficiary producers. The beneficiaries were the trainers, the students and the producers and the agents of the technical services of the State.

According to him, The GIC has also collaborated extensively with the Directorate of Rural Engineering (DNGR) in terms of agricultural equipment and hydro-agricultural developments, the objective of which was to improve the productivity and income of small farms. To achieve these objectives, the GIC has made significant investments in local developments. They have also provided support in technological innovation by subsidizing two mini-rice mills, one in Mopti and one in Niono.

Teaching and Research institutions

As part of its development, the GIC has collaborated with research and teaching institutions, notably the IER and IPR.

At the IER level, the GIC collaborated with the food technology laboratory (LTA) whose objective was the development of the processing link of the rice kit 180. Their role was to ensure the training of the beneficiaries of the kits 180 on good hygiene practices and good practices for steaming the rice kit 180.

Five regions of Mali were chosen as intervention zones of the GIC. These are Sikasso, Kayes, Koulikoro, Ségou and Mopti. At the level of each region, a center was chosen as a reference center, including the Continuing Education Center (CFP/IPR). This made it possible to create a partnership between the GIC and the selected centers including the CFP/IPR. As a result, the CFC/IPR participated in the dissemination of the innovations promoted by the GIC. These disseminations were accompanied by subsidies and capacity building for directors, coordinators of the selected centers, state technical service agents and producers. Furthermore, for capacity building, the coordinators and directors of the selected centers were put in touch with HSL University for the strengthening of pedagogical and didactic capacities. To this end, each center chose its intervention theme and the technical sheets and training modules were designed. It was then that the CFC chose good practices in market gardening and potatoes.

The beneficiaries were the staff of the continuing education center, agents of the state technical services, producers and research institutions. These beneficiaries were trained by the CFP/IPR on value chain analysis, marketing, communication techniques and networking (beneficiaries). The design of training modules and technical sheets for staff were designed.

Financial Institutions

Agrofinance is a GIZ project whose mission is to develop innovations within the various value chains, namely the rice, mango, potato/market gardening value chain (production, marketing and processing links). This is why the agrofinance project was set up by GIZ to help stakeholders acquire credit from financing institutions in order to develop their activities. To this end, Agrofinance connects value chain stakeholders with partner financing institutions such as Kafo Jiginew, Nyesigiso and Baobab. To this end, Agrofinance seeks to strengthen the technical capacities of supply and demand. It is within this framework that Agrofinance identified and analyzed economic models at the level of the various value chains and developed credit products adapted to these economic models.

The beneficiaries of agrofinance services under the GICs are cooperatives, inter-professions and SMEs on the demand side. On the supply side, they are the agents, technicians and managers of financing institutions. The PASSIP/GIZ program, the Minister of Agriculture, the CPASFD, AP/SFD, the inter-



professions of the different value chains (mango, rice, fish, etc.), the DNA, agricultural development offices, financing institutions (Kafo jiginew, Soro jiriwa so, Baobab, BNDA etc.) are among the beneficiaries of the GICs.

Ongoing Activities

Discussions and interviews show that all technical field activities have been stopped since the end of 2023. However, the mini-rice mills in Niono and Mopti are underway and two agents are monitoring progress in the field. In the office, only accounting activities are underway.

3.8.2 Changes/impact of GIC

On beneficiaries

The table below shows a comparison between the baseline values and the achievement rate of some GIC indicators. It can be seen that the yield in rice production of farms that adopted the SRI increased by 236.36% and their income by 272.80%. It should also be noted that the SRI allows for seed savings; water savings; improved soil fertility through the use of organic fertilizer (agro-ecology); adaptation to climate change and reduction of greenhouse gas emissions. Agricultural enterprises have achieved 80% of their target indicator in 2023 and created 1,000 additional jobs.

Table 18: Mali - overview on beneficiaries.

Indicators	Rice Value chain Systems	Base Value	Target value 2023	Achieved 2020	% achieved of indicators
1. Productivity of small farmers. increased 35%	Rice(T/ha)	3,2	4,3	5,8	236,36%
	Rain rice	2,45	3	2,8	63,64%
	Irrigated rice	3,22	4,35	6,0	235,59%
2 Revenu of small farmers increased 35%	Rice (FCFA)	603 196	814 315	1 179 124	272,80%
	Rain rice	549 697	742 090	1 084 813	
	Irrigated rice	620 430	837 580	1 231 213	
4 Agricultural Enterprise			80%	71%	
5. Created Employment crée in entreprises.		0	1000	845	84,5%
B2 Training of farmers			57 000	45 000	80%



Intermediate actors trained					
B5 Information media			141 605	65 750	46%
B3 Chief Enterprise training			1700	4338	255%

On the interprofessions, the national rice platform was able to promote the SRI throughout the country; the organizations were able to be better structured and were put in business relations with other actors. In the rice sector, the SRI was institutionalized. The beneficiaries of the intensive rice growing program were the Rice Offices, the Regional Directorates of Agriculture, the Rice Interprofessions (IFRIZ), the processors and the DNA. The national directorate of small and medium-sized enterprises, the national directorate of vocational training, rural engineering, private centers (Private Center of Zamblala, private center in Kayes, Father Michael, IPR) also benefited from the civs.

Visible and tangible innovations, including good practices in market gardening and agroecologies, the development of value chains have been brought by the GIC program to these beneficiaries. The GIC supported the rural engineering department with the delivery of tools and equipment and the operationalization of innovation platforms.

Within the framework of the agro-finance project there was what is called FEFAME (Financial Education Training Focused on Economic Models). The SRI package further mechanizes the PPU (Deep Placement of Urea) techniques and biofertilizers.

On the GIC partner organisations

As part of the GIC program, DNA had two financing contracts to develop intensive rice farming systems. These two financing contracts allowed DNA to reach a much more advanced level in terms of mastery of intensive production techniques and work efficiency. As part of the SRI, DNA acquired many production techniques and technologies that are resilient to the effects of climate change. Institutionally, DNA benefited from a lot of equipment that allowed it to work in comfort.

Cooperation between GIC partner organisations

The GIC has given the supervision of innovations to the DNA. They have set up teams to work on the modules of the various innovations promoted by the GIC. It is the DNA that is responsible for this training. As part of the sustainability of the activities, the DNA has opted for the anchoring workshops, the transfer of tools (mobile, fixed), the multiplication of continuing training documents.

However, at the cooperative level (Dara Manakoroni planters' cooperative), the GIC focused on training the actors and training on product hygiene. However, the first to be trained continue to train the others on new production and hygiene techniques. The IPR adopted continuous training as an approach to sustainability. To do this, they validated the value links approach and farmer businesses



school was chosen. The DGNR based itself on training the beneficiaries on farm management techniques and the delivery of documents.

To achieve the sustainability objectives of the GIC activities, Agrofinance ensured a strong involvement of all implementing partners in all Agrofinance activities. However, knowledge products (training modules of analysis tools that are supported by partners) were developed by Agrofinance. The role of the partners was to disseminate these knowledge products before, during and after the project. The demand actors were well trained on the financial education modules so much so that they themselves go and seek credit from financial institutions without the support of Agrofinance. These knowledge tools have been mastered by the beneficiaries so much so that they organize meetings, develop credit files and seek financing without the support of Agrofinance.

The GIC maintains local subsidy contracts with producer organizations (actors) and technical services (agent travel) and financing contracts with central State services (DNA)

Approaches for scaling innovations used by the GIC

Step-by-step growth (dissemination in pilot sites)

GIC/Mali made the choice of growth steps for scaling-up innovations. It involves (it is about increasing the number of beneficiaries in time and space):

✓ Growth by step

It is the active promotion of innovation with different actors: state structures, technical and financial partners, private sector etc.

It is generally done after the first stage, so when the innovation has proven itself, when tangible results are available and documented. The communication channels generally used are meetings, fairs, networks, exchange visits, working groups, innovation platforms, websites etc. Replication by others, the 5 projects and programs is often done in a targeted manner, by communicating the results obtained to those responsible for similar projects/programs likely to disseminate the innovation in their intervention areas. It is this work that led to the adoption of the SRI and the Rice Kit by the Support Program for the Local Irrigation Sub-sector, a bilateral program to which the GIC is attached.

✓ Greffe/graftin (PARIZON)

We speak of grafting when we add an initiative (graft) to an existing project (rootstock). This approach makes it possible to broaden the intervention area of the initial project generally through additional funds. This is the case of PARIZON which is a co-financing of the EU to the GIC to cover the Office du Niger area.

✓ Explosion (PN- SRI)

This is when scaling up is done immediately, usually through political support. This case usually occurs when certain political actors are convinced of the merits or results of an action, innovation, practice, etc. and decide to replicate it across a large part of the territory. A concrete example is the interest shown by the Malian Minister of the Environment and Sustainable Development for a National program on SRI because of the positive effects of this practice for the fight against climate change.



Information through the media Community Listeners Club (CAC)

This involves using local radio stations to disseminate information on innovation in local languages with the active participation of grassroots actors and their testimony on the performances observed. Beyond technical supervision, radio makes it possible to reach the greatest number of producers

Training

Training center: the training centers were selected for the training of certified trainers (pools of trainers) in the different production basins

Pools of trainers: Most of the basic technical management only had basic training, as a prelude to the national program, it became important to train certified trainers with in-depth knowledge of the SRI and dissemination approaches (CEP/EEA).

The farmer field school: Is a learning field from a farmer's plot where all the stages of the cultivation technique will be carried out. Twenty (25) to thirty (30) farmers will be mobilized. The lessons learned will be shared compared to conventional practice, and the results are capitalized by the technical supervision.

The agricultural entrepreneurship school: Allows the farmer to be trained on the provisions of profitable management of production and marketing. This is why the combination of CEP/EEA was essential.

Training of basic agents: To ensure the training of a significant number of producers, it is necessary to train the basic technical supervision who in turn will train the producers in their area through the CEP/EEA with the support of the facilitating farmers. **Producers:** They are the beneficiaries; they are trained by the agents through the CEP/EEA

Showcase plot and Open Day: In the process of disseminating innovations to better convince the actors, it is necessary to set up demonstration plots with the application of the parameters to serve as a real showcase for assessing the parameters of the innovation. The mobilization of the actors around the showcase plots is necessary to share the results and convince the most skeptical and hesitant.

Development of educational tools: Manual, film, microfilm: In order to facilitate learning by the actors at the base, the existence of suitable supports is necessary.

The scaling and training approaches have made it possible to have adoption rates of certain technologies introduced by the GIC, the results of which are presented in the table below.

Table 19: Mali - overview on innovation adoption I.

Innovations	# adopters	Eff. Total	% adoption
SME Business Loop	270	302	89%
Kit rice 180 kg et good practices of rice par-boiling	29	45	64%
Multiplication potato seeds	1	5	20%



Conservation house with solar ventilation system	15	16	94%
BPA- Harvest and post-harvest	16	26	62%
Quality approach in SME	6	25	24%

Cross-cutting innovations

Across the board, the SME Business Loop innovation was adopted overall by 9 out of 10 companies, or 89%. Companies in Ségou and Koulikoro have higher adoption rates. Furthermore, in Mopti, just over ¾ of companies, or 78%, have adopted the SME Business Loop innovation. This represents the lowest adoption rate by region.

Table 20: Mali - overview on innovation adoption II.

Region	Adoption	Total	Adoption rate
Bamako	112	125	90%
Kayes	9	10	90%
Koulikoro	19	20	95%
Mopti	7	9	78%
Ségou	18	18	100%
Sikasso	105	120	88%
Total	270	302	89%

3.8.3 Lessons learned on successes, failures and challenges

Successes: Large-scale adoption of the technologies and innovations introduced. Thanks to the involvement of all partners and at all levels. This was facilitated by the development of implementation tools and strategies beforehand. The approach used is step-by-step growth (diffusion in pilot sites); information through the media (Community Auditors Club) and training. It is also necessary to point out the institutionalization of the SRI through the development of the PN-SRI.

Failures: The empowerment of producer organizations has not been effective. The organizations are set up with the support of the projects and most often only last for the life of the project. This is due to the lack of transparency in the choice of leaders, the lack of knowledge of roles and responsibilities and the lack of accountability.

Challenges: The operationalization of institutional innovations and the sustainability of technological achievements. The State lacks financial and human resources to support the PN-SRI. The aim is to bring together the contributions of all stakeholders involved in rice growing to contribute to the production of 2,400,000 tonnes.



3.9 Nigeria (2014-2024)

3.9.1 Description of the GIC

The establishment of GIC in Nigeria augured well with the aspirations of the people of Nigeria given that agriculture is the livelihood of more than 40% of the Nigeria's population of 190 million people. Though the conditions for agriculture are favorable, the demand for food outstrips supply necessitating importation of foods such as rice and wheat. The predominantly smallholder farmers use manual food production techniques rarely adopting agricultural research recommendations such as planting and cultivation techniques. High-quality seeds, fertilizers, and knowledge about good farming practices and the proper storage of food for marketing are all lacking, and therefore crop yields and farmers' in-comes remain below the possibilities offered by innovations and markets. More than 80% of the rural population live in absolute poverty. At the same time, the demand for processed food products is increasing, especially in the cities, where additional opportunities for new jobs in the agricultural industry and higher incomes for farmers can be created (GIZ, 2021).

The interventions were implemented in close cooperation with the Federal Ministry of Agriculture and Rural Development (FMARD), the Federal Department of Agricultural Extension (FDAE) and the Agricultural Development Programmes (ADP) working in agricultural extension at State level.

Objectives of the GIC

The main objective of the GIC program is the transformation of agriculture both technically and politically. The expected results are:

- supplying farms with food, improving their productivity by 30% and improving their income by 30%;
- creating jobs and improving the turnover of agricultural businesses;
- improving governance in the sectors and advocating for the transformation of agriculture.

To achieve these results, the following activities were undertaken in all relevant value chains:

- Improving access to inputs, equipment, markets and training for farms;
- Improving access to raw materials, equipment, markets and training for businesses;
- Advocacy, capacity building, training and support for the governance of inter-professions.

The beneficiaries are:

- the decentralized technical services of the State (DRA, Offices, NGOs);
- seed companies, equipment manufacturers, rice mills, processors, rice parboilers;
- rice, mango, potato interprofessions.

The implementation strategies consisted of:

- disseminating innovations and their scaling up through the strategy of diffusion by controlled growth by diffusion by grafting;
- training of trainers;



- training of a pool of trainers;
- the farmer field school; and
- radio communications.

To do this, tools/supports have been developed to accompany training and activities by translating these supports and tools into the local language; by making microfilms; by establishing showcase plots and by organizing inter-farmer visits and open days.

Priority value chains

In Nigeria, the GIC project operates in four value chains across eight states: maize (Kaduna and Kano), cassava (Oyo and Ogun), rice (Nasarawa, Benue, and Cross River), and Irish Potato (Plateau) (GIZ, 2021) with the aim of improving the income and productivity of small-scale farmers using the following key implementation approaches:

- Strengthening the capacities of small -scale farmers using the Farmer Business School (FBS) and Good Agricultural Practices (GAP).
- Strengthening capacities of small- and medium-sized enterprises using inclusive business model approaches, including the SME Business Loop training.
- Strengthening the capacities of producer cooperative through the Cooperative Business School (CBS).
- Other entrepreneurial capacity strengthening initiatives; Spraying services provision of micro-enterprises (Potato/cassava VCs), Seed Producers Development initiatives, Mobile cassava processing initiative, maize processors entrepreneurial development, etc.

The maize value chain in Nigeria is a vital part of the country's food security, providing income and food to rural populations and smallholder farmers. The maize value chain makes significant contributions to the country's economy. Total value added generated per year corresponds to 0.9% of Nigeria's GDP and 3.8% of the country's agricultural GDP. Nigeria produces on average 8 million tons a year of maize, meeting its domestic demand. Growing at 30 percent a year, Nigeria's aquaculture sector provides excellent commercial opportunities for the maize value chain. Maize provides the main source of energy in fish feed, an input that accounts for 60-70 percent of fish producers' costs, and so a critical element of the competitiveness of aquaculture value chain. Like aquaculture, poultry feed also provides good growth opportunities for the maize value chain, with Nigeria's poultry sector growing at a solid 25 percent a year (USAID, 2012). However, if Nigeria's maize farmers are going to be able to capitalize on these new opportunities, they will need to drive up yields, enabling them to grow both for their family's consumption as well as for the market. This will require enabling farmers to invest in inputs – seeds but particularly fertilizers – through improved access to basic operating capital.

Nigeria is the fourth largest Irish potato producer in sub-Saharan Africa and seventh largest producer in Africa, with an output of 1,284,370 metric tonnes and yield per hectare of 37,201 hg/ha (3,720.1 kg/ha) (FAOSTAT, 2019). Domestic consumption of both fresh and processed Irish potato stands at 4.63kg/capita (FAOSTAT, 2015). Although, the crop is widely cultivated in commercial quantities in Plateau state, it is an underexploited food crop with a huge unrealized potential to improve food security, income and human nutrition. Despite notable efforts devoted to the development and



transfer of new technologies to improve Irish potato production in Plateau State; including Irish potato seeds multiplication, training of farmers, Irish potato research, breeding and selection of new improved varieties, output level has not been increasing at farm level while yields have continued to decline substantially and remain lower than potential yields (FAOSTAT, 2016).

Cassava has been transformed from a low yield famine reserve crop to a high yielding cash crop. It has numerous alternative uses in feed, food and agro-industry (Value Chain). Cassava plays a key role in the agricultural and food supply. It is considered as the most widely cultivated crop in Nigeria and it is predominantly grown by smallholder farmers. There is the need to promote value through chain processes of this crop (Apata, 2019).

Rice is cultivated in virtually all agro-ecological zones of Nigeria, from the swamps and mangroves of the Niger Delta coastal areas to the dry zones of the Sahel. Rice production systems include rain-fed lowland (50 percent), rain-fed upland (30 percent), irrigated lowland (16 percent) and deep water and mangrove rice (Obi-Egbedi and Gulak., 2019). Over the years, rice production has increased but in spite of the increase in production, Nigerian rice consumption still far outstrips its production, resulting in imports of 2.5 Mt of rice per annum. Weaknesses in downstream and upstream sectors of the value chain abound necessitating need for innovations.

National partners of the GIC

The Green Innovation Centres partnered with many organizations during the project period that supported their work, among them:

- Federal Ministry of Agriculture and Food Security (FMA-FS)
- Federal Department of Agriculture and Extension (FDAE)
- National Root Crop Research Institute (NRCRI)
- International Potato Centre (CIP)
- Farm Radio International (FRI)
- International Institute for Tropical Agriculture (IITA)
- National Agricultural Extension and Research Liaison Services (NAERLS)
- Agricultural Development Program (ADPs)
- Federal College of Agriculture (FCAs)
- National Agricultural Seed Council (NASC)
- Rice Farmer Association of Nigeria (RIFAN)
- National Cereals Research Institute (NCRI)
- Institute for Agricultural Research (IAR)
- State Ministry of Agriculture
- Private Organizations
- Farmer Cooperative Organization
- Processors organizations

The Federal Ministry of Agriculture and Rural Development was the main organisation/partner responsible for implementing the project. The earliest engagement was in 2014 but most of the other supporting organizations started engaging in GIC activities in 2016 and ended them in 2023. The main roles of the partner organizations were to mobilize and train farmers on contract farming, good



agricultural practices and farming as a business. The trainings were achieved through extension messages in form of radio programmes, farm demonstrations and farm exposure/exchange visits. Other roles of the partners included provision of improved seed and linking farmers to input and output markets.

Ongoing activities

In most organizations the GIZ-funded GIC activities have ended except the activities undertaken by AgFin which are expected to conclude in 2025. AgFin is the bridge linking the agricultural and financial sectors by providing demand-driven advisory and facilitating improved access to suitable financial services (GIZ, 2023). Farmers Business School suitability phase which is financed by FMA-FS is also ongoing as is the implementation of the National Potato Strategy.

Despite of this situation, most of the organizations are willing to continue with the GIC related-activities. For instance, Value Seeds Limited intends to sustain its contract farming training program for farmers and CIP will continue collaborating with NRCRI and NASC on seed production and quality assurance. FMARD will also continue undertaking capacity building of value chain actors. Pioneers Multipurpose Cooperative Society will continue to collaborate with FARMSI to see that all GIC innovations outcomes are sustained. Farm Network Services Limited will continue working with Aseyoneshi Multipurpose Cooperative Society Limited on contract farming. Farm Radio International will still work with other radio stations and Value Chain Actors to disseminate agricultural information. Tsefan Ventures will continue partnering with extension services and other local agricultural organizations to reinforce the gains achieved through GIC-supported programs, particularly in contract farming and GAP.

3.9.2 Changes/ impact of the Green Innovation Centres

The following section highlights the changes/impacts realized as a result of the implementation of GIC activities from the perspectives of ultimate beneficiaries and partner organizations. The innovations introduced have led to varying positive impacts such as increased crop production, introduction of better seed varieties, increased income and increased farmer knowledge. Generally, the magnitude of these impacts has been high.

On beneficiaries

There has been a positive impact of the organizations' involvement in GIC activities on ultimate beneficiaries along the various value chains. Table 21 summarises the changes/impacts of the innovations on category of various actors along the value chains.

Table 21: Nigeria - overview on group beneficiary accounts.

Beneficiary	Changes/Impacts	Innovation	Observed or expected?	Magnitude	Explanation
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Smallholder Farmers	Increased paddy recovery	Contract farming	Observed	3	Contract farming training improved yield.
	Increased yield	GAP	Expected	2	
	Improved value chain linkages/activities,	FBS, CBS, Farm Radio	Observed	2	Farmers capacity was grossly enhanced technically through various training and mentoring
	Plant population	GAP (Spacing)	Observed	3	Adoption of recommended spacing
	Uptake of new practices	Improved seedlings		3	All actors improved on knowledge.
	Improve production and management capacity	Production of seeds potato from cuttings	Observed	2	Adoption of innovation
Women	More involvement by women	Women ambassadors	Observed	3	More interactions with the introduction of women ambassadors adopted.
Women and Youth	Improve production and management capacity	Production of seeds potato from cuttings	Observed	2	Capacity for production Innovation in seeds production
Extension agents	Improved GAP knowledge	GAP	Observed	3	Enhanced GAP adoption among farmers.
Seed producers	Increased Seed production and multiplication	Open access varieties/ RAC technology	Expected	3	There were no open access varieties to be multiplied from EGS.
FARMNET	Higher processing capacity	Better storage handling and processing	Observed	3	
Aseyoneshi farmers group	Increased paddy supplies	Sustainable rice production	Observed	2	
Processors	Product commands good pricing	CBS (Packaging)	Observed	3	The product command go price
Agro-chemical seller	Reduced drudgery	Awareness of agro-chemicals	Expected	3	This reduced stress and number of workers in the farm



Radio Teams	Capacity building	How to produce interactive radio series	Expected	3	Attraction of a huge number of farmers
Resource persons/ experts	Increased in knowledge and capacity to support farmers	Supplied answers/responses and solutions to farmers on radio	Observed	3	They increased in knowledge and became consultants, made more money supporting farmers
Input dealers	Uptake of new practices	Improved seedlings		3	Knowledge of actors improved.

(rating: 1 "low" 2 "medium" 3 "high")

Table 22 summarises the changes/impacts of the innovations on various individual beneficiaries along the value chains.

Table 22: Nigeria - overview on individual beneficiary accounts.

Beneficiary	Changes/Impacts	Innovation	Observed or expected?	Magnitude	Explanation
Tajan	Use of improved varieties	GAP	Observed	3	Increase in yield and income
Akila	Timely use of fungicide	GAP	Observed	2	Increase in yield and income
Rakiya Habila	Planning	GAP	Expected	3	Timely preparation for farming throughout the year.
Briskila Chake	Improved post-harvest handling and storage	GAP	Observed	2	Increase in income due to drastic reduction in postharvest losses
Caleb Mafuyash	Use of improved varieties	GAP	Observed	3	Due to use of improved varieties
Emmanuel Bitrus	Reduction in crop losses due to disease infestation	GAP	Expected	2	Timely application of fungicide leading to increase in yield
Helen N. David	Plant population improved greatly.	GAP	Expected	3	Training on the right plant population
Salome Sati	Use of improve varieties	GAP	Observed	3	Increase in yield/income
Mahan Mashingil	Using of cropping calendar for farm operations	GAP	Observed	3	Timely farm operations by following the cropping calendar as help to increase my yield
Paulina Pankyes	Bulk purchase and group sales	FBS	Expected		Better price inputs and produce.



Samuel	Group sales	FBS		2	Acceptance of innovation leading to high yield and income
Solomon Yanet	Delivery of business services to my community	CBS	Observed	3	After the CBS training, he realized the business opportunity of pest control services to his community.
Matawale	Spray service	CBS	Observed	3	Increase in yield and income

(rating: 1 "low" 2 "medium" 3 "high")

On the GIC partner organization

The partner organizations reported realizing a clear understanding of the needs and demand for innovations given farmer circumstances. Involvement of female technical team in trainings was another change realized by partners involved in training. Specific innovations and impacts are summarized in Table 23.

Table 23: Nigeria - impacts of innovations on GIC partner organizations.

Changes/Impacts	Innovation	Observed or expected?	Magnitude	Explanation
Improved contract farming scheme	Contract farming	Observed	3	GIC training enhanced contract compliance, resulting in higher paddy recovery rates.
Better adherence to GAP leading to improving rice yield and sustainability.	Good Agronomic Practices	Observed	3	Increased number of staff and farmers trained on GAP
Enhanced farmer commitment and trust	Contract farming	Observed	3	Farmers honored agreements more, increasing contract success rates.
Improved income and Livelihood	FBS	Observed	2	Most farmers trained have adopted the cooperative model to drive their farming activities
Improved Collaboration	Strategic partnership	Observed	3	Partners are the drivers of innovations
Increased visibility	Strategic partnership	Observed	3	Engagement with stakeholders in the potato value chain
Networking with other partners	Content creation on GAP	Observed	3	Connection with other partners supported us to achieve huge success on the project
Increase in the interactivity of listeners on the radio programs	More calls and questions	Observed	3	More interactivity leading to more women and youth in farming
Capacity to do contract farming enhanced.	Local seed potato production through	Expected	2	Capacity across board has been created.



	Apical Cuttings			
Extension services on GAP, FBS & CBS enhanced	Multiple methods used e.g. Radio programmes, farm demos			Training led to increased knowledge on GAP, FBS and CBS among staff
Improved business skills for farmers enhanced	Farmer business training	Observed	2	Farmers gained knowledge in record-keeping and financial planning, improving their management practices.

(rating: 1 "low" 2 "medium" 3 "high")

Cooperation between GIC partner organizations

Most of the organizations are willing to continue with the GIC activities. They want to cooperate with different stakeholders. This will be done through capacity building, continuous engagements on innovations, linking with financial organizations and radio programs.

Some of the strategies undertaken to ensure sustainability of project activities include:

- Capacity building (through training) of value chain actors
- Development of National Potato Strategy
- Establishment of National Potato Multi-Stakeholder Platform to continue with innovation interventions
- Mainstreaming GIC Programmes such as FBS and CBS into beneficiary yearly workplans
- Continuation of radio programmes for farming activities
- Establishment of farmer-led demonstration plots at village levels

Innovations promoted by the GIC

GIC activities promoted and scaled-up several innovations in the various value chains. The innovations include

- Contract farming
- Good Agronomic Practices (GAP) with interventions such as plant spacing or optimal plant population; farmer awareness on use of agrochemicals
- Farmer Business School (FBS)
- Cooperative Business School (CBS) with interventions such as group purchase of inputs and group sale of farm produce; packaging
- Farm Radio International with interventions such as production of interactive radio series and creation of more content on GAP
- Better storage, handling and processing of rice
- Sustainable rice production
- Potato production through apical cuttings
- CIP Strategic Partnership with other partners such as National Agricultural Seed Council (NASC) and National Root Crop Research Institute (NRCRI) for seed production and NACGRAB



Table 24 summarises the key innovations that were promoted and scaled up in the various value chains

Table 24: Nigeria - innovations and their status of adoption/scaling-up.

Innovation	Explanation of status of adoption/scaling	Rough estimate of rate of adoption
Contract farming	High adoption with improved farmer compliance	72% paddy recovery
	Medium overall	60% adoption rate
	Adopted and in practice	600 farmers targeted and reached
	Farmers increasingly adhere to contract terms	70% of participating farmers reported higher yields and compliance.
Good Agronomic Practices (GAP)	GAP training has been widely adopted, improving productivity of various value chains	70 -80% of participating farmers
GAP (Spacing)	Well and Highly adopted	Over 80%
GAP (timely weeding)	Well and highly adopted	Over 80%
Farmer Business School (FBS)	Most farmers' cooperative has adopted modern farming models	350-400 farmers in 7 states where training was done
	Highly adopted	80-90% of participating farmers
Cooperative Business School (CBS)	Most farmers now value the strength of many against one	350-400 farmers in 7 states we trained
	Some participating farmers have adopted different business opportunities in their communities.	50 -70 % of participating farmers
CBS (Packaging)	Well adopted	Over 70%
New potato varieties	Released four varieties	20%
Rooted Apical Cuttings	Introduced technology to private and public seed producers	10%
Improved seed and ware potato storage facilities	Constructed low-cost seed and ware potato storage facilities	5%
Improved seedlings / apical potato cuttings	Most actors along the value chain adopted improved seedlings	80- 90 %
Seed potatoes	Seeds are now being produced from cuttings being made available to farmers	80%
Sustainable rice production	Adopted and in practice	1200 small holder farmers targeted, 80% reached
Platform	Now a value chain networking forum, provider of information on new technology and innovation, access to markets and finance as well as continuous capacity building	80% of participants using

3.9.3 Lessons learned on successes, failures and challenges

Undertaking the activities of the GIC, led to realization of some successes, notable among them:

- Through training, farmers gained more knowledge and awareness about the four value chains for increased food security, incomes and livelihoods.



- Bringing actors together from both the public and private sectors as well as the nongovernmental for promotion of the innovations.
- Introducing innovations that were not being thought of such as apical cutting technology for seed potato production
- Elevating the capacity and knowledge of government functionaries and agencies on the value chain actors
- The development of the National Potato Strategy Document was a significant milestone for the crop and the country.
- Increase in yield and income due to adoption of GAP (e.g using improved and high yielding varieties, disease management etc)
- Introduction of GAP and FBS to farmers leading to a better standard of living
- Linkage of farmers to modern market for better sales of produces.
- Linkage farmers to financial institutions
- Introduced to contract farming and groups sales
- Establishment of farmer-led demo plot to re-enforce learning
- Empowerment of women and youth through skills acquisition for increase productivity
- Establishment of farmer-led demo plot to re-enforce learning
- Many of our members today have adopted some modules taught in FBS and CBS as a way of life in their various families.

Despite the successes, the value chain actors faced several challenges, notably:

- Dealing with people is not easy because there will always find laggards.
- Institutionalizing and sustaining some of the activities due to poor public sector funding for agriculture in general and the crop in particular
- Unclear how to implement the National Potato Strategy
- Limited access to improved potato varieties
- Insufficient water bodies (irrigation) for dry season production
- Insecurity challenges (farmers/herder crises) especially in Plateau State
- Access to adequate mechanization
- Poverty high interest rates on loans for farming
- Inefficient input distribution systems
- Limited market access and price volatility
- Climate change and weather-related risks
- Soil degradation and environmental concerns



- Inadequate resources to cater for farmers allowances during training

Several lessons can be drawn from implementation of the GIC activities in Nigeria. They include:

- GIC activities demonstrated the importance of contract farming in improving yield and compliance among farmers, as well as the value of ongoing training in GAP.
- The support provided by Value Seed Limited helped build trust and sustainable farming practices. There is need for adopting a holistic approach to seed systems development
- There is need for sustainability and scalability considerations at the beginning of the project
- It is important to establish Public-Private Partnerships for local based solution to farming challenges
- Although the GIC program is considered a success, in future programs should be more tailored to individual farmers' organizations given their peculiar challenges
- The structured training on GAP and contract farming led to improved yields, better adherence to farming agreements, and stronger trust between Tsefan Ventures and contracted farmers.
- The collaboration with GIC underscored the effectiveness of contract farming in creating a dependable supply chain for processors like Tsefan Ventures.
- The GIC support provided helped build trust and sustainable farming practices.
- A proper exit strategy should be put in place to sustain the gains of the programme.

Overall, it can be concluded that:

- No single innovation dissemination approach is adequate. This was demonstrated by the various methods used: farmer to farmer exchange visits; demonstrations; use of ICT-based messaging applications; use and provision of training manuals/charts/pictorials, brochures and fliers.
- Innovation adoption requires concerted effort from all value chain actors including provision of political partners; federal Ministry Agriculture and Rural Development for regulation, supporting policy and conducive environment.
- Largely, the GIC activities in Nigeria realized their objectives of increasing productivity, food security, rural incomes particularly for women and youth.

3.10 Togo (2014-2024)

3.10.1 Description of the GIC

Objectives of the GIC

The main objective of the GIC in Togo is to promote the adoption of innovations in the agricultural and food sectors. The goal is to significantly increase the yields of small farmers while improving their incomes. As a result, this contributes to improving food supply in the targeted regions. Moreover, the



project aims to create jobs in these areas, thus stimulating the local economy. By focusing on three main crops, the ProCIV-TOGO project seeks to sustainably transform the Togolese agricultural landscape, combining innovation, training, and increased productivity.

Priority value chains

GIC activities in Togo focus on the value chains of soy, peanuts and cashew:

Soy

The Interprofessional Council of the Soy Sector (CIFS), created to strengthen the soy sector, comprises three key components: the National Federation of Soy Producers' Cooperatives (FNCP), the Togolese Association of Soy Processors (ATT), and the National Association of Soy Traders and Exporters (ANES).

95% of the soy market is destined for sale. 20% consists of organic soy exported to European, American, and Asian markets, while 75% is conventional soy, of which 36% is for export, 24% for roasting, and 15% is processed in various ways. Finally, 3% of the market is for seed production, and 2% for self-consumption. Togo imports soy oil from Asian regions.

Peanut

Peanuts are mainly produced in the Kara and Savanes regions, with much lower production in the Plateaux and Maritime regions, where a production cycle is possible within a year. In 1998, 42,000 tonnes were produced, compared to 36,700 tonnes in 2024 (FAO, 2017).

Currently, peanut production is declining due to a lack of mastery in production techniques, a shortage of seeds, and climate disruptions. Its value chain has not received significant attention in Togo to date.

Thanks to the work of ProCIV, efforts are now focused on increasing seed production and implementing better agricultural practices, including recommendations to reduce aflatoxin contamination.

Peanut production is intended for both self-consumption and sale. Despite contributing significantly to better organization within the sector, ProCIV has not succeeded in fully structuring it. However, the participants have been strengthened with strategies to anchor innovations promoted by GIZ/ProCIV, particularly through providing tools to raise awareness among local women on best practices for peanut cultivation.

Cashew

The cashew value chain in Togo was analyzed in 2016. There are four main production zones: the Central region, Plateaux, Kara, and Savanes. The sector is experiencing significant growth, with the number of producers expected to rise further due to increased prices during the 2014–2015 period and the establishment of two new processing factories. The cashew industry is anticipated to play a more prominent role in the Togolese economy. Additionally, Togo benefits from being surrounded by countries with extensive experience in promoting the cashew sector. Established in 2016, CIFAT (Interprofessional Council of the Cashew Sector in Togo) unites five groups of stakeholders: Cooperative of Cashew Nurserymen of Togo (COPAT), National Federation of Cashew Producers' Cooperatives in Togo (FNCPATOGO), Association of Cashew Buyers in Togo (3A-Togo), Togolese Association of Cashew Processors (ATTA), and the Council of Cashew Exporters (CEFA).



Until 2015, the cashew market consisted of self-consumption and local sales. These crops were selected for their potential to improve yields and the incomes of smallholder farmers. The project covers a vast geographical area, extending across four of the five regions of the country for cashew cultivation, while soy and peanuts are grown in all regions of Togo. The transversal themes include: organic agriculture, agricultural finance, food security, etc. These issues are addressed through the introduction of improved varieties and good agricultural practices, the development of farmers' self-financing capacity, and increased yields to improve food availability.

National GIC partners

The main national partners were:

Public sector: the Ministry of Agriculture, Livestock and Fisheries (MAEDR) and its decentralized national directorates, including: The Togolese Institute of Agronomic Research (ITRA) for research purposes; the Institute for Technical Advice and Support (ICAT) for the dissemination of technical knowledge and large-scale extension.

Private sector: Processors, seed companies, farmers' organizations, etc.

Civil Society: NGO (Unit for Basic Development Support (CAPAS)).

Ongoing activities

The ongoing initiatives focus on awareness-raising, training, and the distribution of nurseries related to cashew. Inter-professional relationships between different links in the supply chain are continuing. The multiplication of polyclonal seedling parks of improved Ghanaian seeds is ongoing. Regarding soy, the "TGX2007-11F" variety, which was selected by producers after testing, is being disseminated. The production of seeds is also progressing smoothly to bring seeds closer to producers and make them available. Inter-professional relationships between different links in the supply chain are continuing. As for peanuts, while ProCIV has not contributed much to the better organization of the sector, particularly at the structural level, participants in peanut production continue to strengthen strategies for embedding innovations through the provision of tools to raise awareness among women at the grassroots level about best practices for peanut production.

3.10.2 Changes/impact of GICs

On beneficiaries

The GIC in Togo have achieved remarkable results in several key areas. Farmers have refined their grafting techniques and have now mastered post-planting and post-harvest practices. Similarly, there has been progress in string harvesting techniques and the expansion of areas planted with improved cashew clones, in conjunction with beekeeping practices. Notable improvements have also been observed in the areas of soy and peanuts, benefiting the recipients, as shown in Table 25.



Table 25: Togo - key achievements by region.

Regions	Achievements
Maritime	- Support to 3,650 agricultural operators in the soy and peanuts value chains through the dissemination of best practices, facilitation of access to inputs (certified seeds, (organic) fertilizers, etc.), collective purchasing and selling, - Promotion of 19 agribusinesses (soy exporters, peanut processing, and cashew processing) - Support for the establishment of the National Organic Agriculture Association - Support for the development of Togo's national organic agriculture strategy
Plateaux	- Support to 24,555 agricultural operators in the soy and peanut value chains through the dissemination of best practices, facilitation of access to inputs (certified seeds, (organic) fertilizers, etc.), collective purchasing and selling, promotion of beekeeping in cashew plantations, etc. - Promotion of 87 agribusinesses (soy exporters, peanut processing, and cashew and apple processing) - Establishment of 2 cashew tree nurseries in the Est-Mono region
Central	- Support to 18,751 agricultural operators in the soy and peanut value chains through the dissemination of best practices, facilitation of access to inputs (certified seeds, (organic) fertilizers, etc.), collective purchasing and selling, promotion of beekeeping in cashew plantations, etc. - Promotion of 112 agribusinesses (soy exporters, peanut processing, and cashew and apple processing) - Establishment of 3 cashew tree nurseries in the Tchaoudjo and Sotouboua regions
Kara	- Support to 24,346 agricultural operators in the soy and peanut value chains through the dissemination of best practices, facilitation of access to inputs (certified seeds, (organic) fertilizers, etc.), collective purchasing and selling, promotion of beekeeping in cashew plantations, etc. - Promotion of 61 agribusinesses (soy exporters, peanut processing, and cashew and apple processing) - Creation of a new international Master's program in "Farm Management" at the University of Kara, with support from the partnership with the Weihenstephan-Triesdorf University of Applied Sciences in Germany - Strengthening of the CIDAP agropastoral centre (support for the development of training curricula, promotion of agroecological and climate-smart practices) - Strengthening the administrative and technical capacities of technical staff from NGOs and Associations supporting agricultural producers - Establishment of 2 cashew tree nurseries in the Kozah and Dankpen regions
Savanes	- Support to 14,075 agricultural operators in the soy and peanut value chains through the dissemination of best practices, facilitation of access to inputs (certified seeds, (organic) fertilizers, etc.), collective purchasing and selling, promotion of beekeeping in cashew plantations, etc. - Strengthening the administrative and technical capacities of technical staff from NGOs, umbrella organizations, and Associations supporting agricultural producers - Promotion of 56 agribusinesses (soy exporters, peanut processing, and cashew or apple processing) - Establishment of 2 cashew tree nurseries in the Kpendjal-Ouest and Oti regions



On the GIC partner organizations

The Green Innovation Centres (GIC) have had a significant impact on partner organizations from the public, private, and civil society sectors. The ITRA (Institut Togolais de Recherche Agronomique) has notably strengthened its research capacities through tests and the selection of varieties adapted to local environmental conditions. This has led to strengthened and developed partnerships with international institutions, as evidenced by collaborations with organizations in Ghana for cashew, with IITA in Nigeria for soy, and with ICRISAT in Mali for peanuts. This strengthening is illustrated by the rigorous selection process that resulted in the adoption of the "TGX2007-11F" variety for soy and "ICIAR19BT" for peanuts.

ICAT (Institut de Conseil et d'Appui Technique) has seen improvements in its agricultural extension services. Among the many varieties introduced, ICAT helped establish cooperative cells that have evolved into federations. The project led to improved working methods, with the adoption of innovations through participatory approaches that directly involved farmers.

Collaboration between partners has fostered the creation of exchange platforms through the establishment of cooperatives, unions, and federations of producers, as seen with cashew and soy producers.

The sustainability of this cooperation is embedded in the continuation of agricultural activities beyond the end of the project. The newly acquired ability of farmers to self-finance both individually and collectively has reduced their dependence on external funding. The sharing of knowledge, which is a crucial aspect of this cooperation, is demonstrated through continuous training for local trainers capable of teaching other farmers, particularly in cashew cultivation. This cascading training approach contributes to the effective dissemination of new techniques and agricultural practices introduced by the project.

The introduction of improved varieties, coupled with farmer training and the dissemination of best practices, has led to a substantial increase in yields and income. The strengthening of farmer organizations and the development of their self-financing capacity suggest that the results will be sustainable beyond the end of the project. The strengthened collaboration between research institutes, extension services, and producers has created a favorable ecosystem for continuous innovation in Togo's agricultural sector. This is well illustrated in Table 26.

Table 26: Togo - key achievements based on partner organization and cooperation between partner organizations.

	Achievements
Production	- Selection and dissemination of 13 innovations (Good Agricultural Practices, beekeeping, group buying and selling, e-agriculture+, Farmer Business School, management of new plantations, grafting, etc.) - Training of 81,377 farmers on selected innovations - Training of 1,984 partner trainer-technicians, including 14% women - Support to the CTHEV in the process of registering 3 new soy varieties and 4 new peanut varieties in the catalog



	- Support to the CTHEV in updating and printing the third edition of the catalog - Support to the ITRA in the participatory selection of climate-smart new soy and peanut varieties through multi-location trials in farming environments - Support to the ITRA in conducting multi-location trials on the effectiveness of AflaSafe BF01 on peanuts in the Savanes, Kara, and Central regions - Support to the emergence and capacity building of endogenous resources through capacity strengthening and the provision of smartphones to Endogenous Animators (soy, peanuts) and Endogenous Trainers (cashew) - Over 1,500 producer groups supported in carrying out group buying and selling - Impacts : - o 124 companies improved at least 3 of the following 5 parameters: turnover, business relationships, clients, production costs, investment - o Creation of 2,836 new jobs in supported companies
MPME	- Selection and dissemination of 12 innovations (cashew processing, cashew apple processing, certified seed production and marketing, SME business loop, business management, product standards and quality, etc.) - Capacity building of 3,024 promoters and/or company staff on the selected innovations. - Facilitation of the participation of over 20 companies at Biofach. - Establishment of sustainable commercial links between companies and farmer organizations (OPAs). - Support to improve the supply of quality seeds by enhancing the capacity of the seed network to diversify their product range and establish forward production contracts. - Partnership for access to certified seeds between ITRA, the Seed Network, and NGOs supporting producers. - Impacts : - o 29% increase in productivity for soy, 112% for cashew, and 22% for peanuts. - o 37% increase in revenue (gross margin) for soy, 18% for cashew, and 23% for peanuts.
Cross-cutting	- Development and dissemination of the e-agriconseil+ application supported by ICAT to assist the advisory support system. - Support for the establishment of the national association for organic agriculture.

Innovations promoted by the GIC

In terms of agricultural technical innovations, the CIV has introduced grafting techniques promoted by endogenous trainers. This has led to the development of an innovative coupling technique combining cashew production with beekeeping. Additionally, string harvesting techniques have been perfected. In the field of processing and consumption, the taboo surrounding the danger of consuming cashew with milk or sugar has been broken. Techniques for processing and extracting oil from soy and peanuts have been mastered. The establishment of self-financing systems, the development of contractual mechanisms, and the creation of networks of endogenous trainers have been implemented. In the commercial sphere, the use of the information system "N'kalo" for monitoring prices in international markets has been adopted. The establishment of inter-professional agreements and the development of capacity for tracking international prices marked significant advancements.



3.10.3 Lessons learned on successes, failures and challenges

The GIC in Togo have recorded several notable successes in their implementation. The development of interactions between the different segments of the value chain proved particularly effective, supported by the creation and dissemination of a standardized cost formula. The techniques for managing new orchards showed marked improvement over local orchards, while the creation and implementation of a technical-agricultural reference framework for cashew provided a structured framework for agricultural practices. The establishment of cost structures at various production sites also contributed to better economic management.

However, several difficulties and failures have been identified in the project deployment:

- The large-scale deployment of developed innovations remains insufficient, and the lack of mastery over the carbon credit mechanism in the production process is a significant limitation.
- The project faces a persistent difficulty in accurately surveying cashew producers.
- The lack of resources to support young people wanting to enter cashew production presents a major barrier to generational renewal.
- The low rate of local processing compared to the volume of exports, along with the export of cashew shells and pedicels for processing abroad rather than locally, highlights the limitations in creating added value at the national level.

Given these circumstances, the primary challenge is to reassess the strategy for scaling up the initial successes.

3.11 Zambia (2014-2025)

3.11.1 Description of the GIC

Zambia's agricultural sector is key in promoting the country's socio-economic and environmental growth, development and sustainability. The sector assures household and national food and nutrition security, is a major source of livelihoods for about 72% of the Zambian population, in both rural and urban areas, especially small- and medium- scale women and youth farmers, and offers job and wealth creation opportunities. Agriculture is also the main supply of raw materials for the manufacturing and food processing industries, since the Country's manufacturing sector is principally agricultural-based.

The Sector's contribution to Zambia's gross domestic product (GDP) is also appreciable. However, its contribution to GDP growth has declined over the years, decreasing from 9.3% in 2012 to 3.4% in 2021. Additionally, Agriculture contributes to the Country's export earnings, through non-traditional exports (NTEs); currently accounting for about 29% of NTEs and 7% of total national exports.

The Country's agricultural potential is huge but not fully exploited. With its total land size of 752,618 Km² (75 million hectares), 42 million hectares (Ha), i.e. 58%, of which is arable, but only 10-15% is under cultivation. The available land for irrigation is 2.75 million Ha, with only about 200,000 Ha currently being utilized. The Country also has abundant surface and underground water: with surface water largely from four (4) lakes (Bangweulu, Kariba, Mweru and Tanganyika) and five perennial big rivers (Chambeshi, Kafue, Luangwa, Luapula and Zambezi). And yet the Country's agriculture is predominantly rain-fed, particularly among the majority small- and medium-scale farmers.



The Sector faces a number of challenges, contributing to the Country's failure to fully exploit its potential. The notable challenges include: vulnerability to climate change, low productivity and production, limited access to and availability of agricultural finances, inadequate investment in agricultural technological research and development, low levels of mechanization, largely rain-dependent, inefficient input and output markets, inadequate storage facilities (high post-harvest losses), limited value-addition and processing, and inadequate and inefficient public extension-service delivery systems.

Objectives of the GIC

The main or overall goal of the GIC is promoting innovations that contribute to sustainability of rural development, in the agricultural and food industry sector of Zambia. This is to be achieved by supporting the growth of the soybeans, groundnuts, and dairy value chains. Soybeans and groundnuts being ideally suited for cultivation in rotation with maize and contributing to soil quality improvement. Milk production was considered for providing farmers with a non-seasonal source of income. Additionally, both soybeans and groundnuts, as well as milk are high in proteins, which are valuable in fighting the high cases of malnutrition in Zambia, especially among the children.

On the other hand, the following were the reported main goals of the GIC, from the perspective of the interviewed stakeholders; and depending on their mandate or areas of interest:

- i. To uplift the livelihoods of small-scale farmers through the promotion of not only dairy, but also crops and fish value chains.
- ii. Promoting value chains with high potential for improving livelihoods of small-scale farmers, in view of the adverse effects of climate change.
- iii. To introduce multiple and increased farming practices for small-scale farmers for enhanced production of food legumes, and with surplus as inputs into the processing value chains.
- iv. To organize small-scale farmers into cooperatives so as to increase the number of partners with the Community Markets for Conservation (COMACO), for innovations; and to organize cooperatives into a Federation, which is to become a legal member of the COMACO Board.
- v. To promote various innovations (agricultural practices) among small-scale farmers, namely: seed multiplication, good post-harvest techniques, crop rotation, agro-forestry, reduction of aflatoxin contamination, and making and using organic manure (compost).
- vi. To increase income levels of small-scale dairy farmers in Southern Province.
- vii. To build the capacity of small-scale farmers in various aspects of the dairy value chain, such as: milk hygiene at farm level and milk collection level, food safety, good manufacturing practices, and safe handling of agricultural chemicals.

Priority value chains

The GIC in Zambia focused on three value chains or agricultural commodities, namely soybeans, groundnuts, and dairy (milk); including animal health as a cross-cutting issue.¹⁴

¹⁴ https://www.giz.de/en/downloads/giz2021_en_GIAE_Factsheet_Zambia.pdf



The innovations for the soybeans and groundnuts value chains are or were implemented in the Eastern Province, whereas for the dairy value chain are or were undertaken in the Southern Province, of Zambia. This is because these are the two provinces where the production of these agricultural commodities is predominant among small-scale farmers. The justification for selecting these specific value chains include:

Soybeans: In Zambia, the crop is largely grown by large-scale (commercial) farmers, a cash crop. In line with Zambia's National Crop Diversification Strategy, the Government is especially and particularly promoting soybeans among the majority small-scale farmers in order to enhance their economic livelihoods and nutrition. Other considerations for the Government's promotion of soybeans among small-scale farmers are improving soil fertility, climate resilience and creation of job opportunities, particularly for women and youth, in view of the rapidly growing market, domestically and within the Southern Africa Region. For improvement of soil quality, especially in Zambia where maize is grown throughout and everywhere, soybeans is recommended for cultivation in rotation with maize. The growth of the soybeans value chain in Zambia is predominantly driven by the continued expansion of the livestock and edible oils subsectors. Therefore, the GIC Project aims to contribute to these Zambian Government aspirations. Additionally, Zambia is not only among the highest producers of soybeans in Southern Africa, but also in the whole African continent. For instance, in 2021 the countries with the highest volumes of soybeans in Africa were: Nigeria, South Africa, and Tunisia, followed by Zambia, Benin, Togo, Ghana, Malawi, Ethiopia, Uganda, and Mozambique. And in the Southern Africa Region, Zambia is the second major producer of soybeans (produced 296, 866 tons in 2020), behind South Africa (produced 1,245,500 tons in 2022), while Malawi is the third (having produced 180,000 tons in 2020), according to recent data by FAO (Mtisunge B. Mngoli, 2022).

Groundnuts: is the second most important legume, as a food crop, in Zambia, after beans. As a legume, it has similar benefits to soybeans, with regard to improvement of soil fertility and nutrition, and is also one of the major oilseed crops. Like soybeans, with regard to helping in soil quality improvement, groundnuts are also ideally recommended for cultivation in rotation with maize, especially in Zambia where maize is grown throughout and everywhere, as a staple food crop. Therefore, groundnuts have a vital role in the livelihoods of the majority of the Zambian rural population. Historically, small-scale farmers have dominated the production of groundnuts in Zambia: small-scale farmers' groundnuts production account for nearly more than 95%. Nevertheless, commercialization of groundnuts among small-scale farmers remains low. Eastern Province, which is one of the target areas for the GIC Project, is the largest producer of groundnuts in Zambia, and yet has one of the highest rates of poverty and malnutrition.

Some of the challenges facing the groundnuts value chain include: low yields and production, largely due to the low use of hybrid seed and, instead, more of recycled Open Pollinated Varieties (OPV); labour-intensive and so most households grow more groundnuts for home consumption (80%) rather than for commercial market, exacerbated by low and unpredictable prices; and high levels of aflatoxin contamination, which is a major limitation for accessing international markets.

Dairy (milk): Dairy cattle and milk products are among the important livestock and livestock products in Zambia. As at January 2018, Zambia had a total cattle population of 3,714,667, of which 1,603,078 were cows, according to the 2017/2018 Livestock and Aquaculture Census Report. By the end of December 2023, the cattle population increased to about 4.84 million, out of which dairy cattle accounted for 450,021, according to the latest data from the Ministry of Fisheries and Livestock (MFL).



Total milk production in 2022 was about 90.79 million litres and increased by 3.1%, in 2023 to about 93.60 million litres. Southern Province, which is one of the target areas for the GIC Project, is the largest cattle-rearing area in Zambia: and accounted for the highest number of cattle (1,315,238, at 35.4% of the total national herd), according to the 2017/2018 Livestock and Aquaculture Census.

The different GIC partners that are or were involved in the GIC Project, implemented various activities in one or more of these three value chains, e.g. the MFL implemented various activities in the dairy value chain, including animal health, Monze Dairy Cooperative Society implements activities in the dairy value chain only, while the Community Markets for Conservation (COMACO) undertook various interventions in the soybeans and groundnuts value chains.

National Partners of the GIC

Implementation of the GIC activities aimed to involve collaborations with various partners, from different stakeholder categories, i.e. Public Sector (line Ministries, Departments and Quasi-government Institutions), Private Sector, Farmers' Organizations/Cooperatives, Research Institutions, International and Local Non-Governmental Organizations (NGOs), and Public sector- and Private sector-led Projects.

During the study, ten (10) institutional partners, including a former employee of the previously participating institution, were identified (see Annex b), and out of which Key Informant Interviews (KII) were held with five (5)¹⁵. In the implementation of various GIC activities, the interviewed partners reported to have been collaborating with one or more other institutions, among the listed 10, but also included the none-listed, namely: Ministry of Agriculture (MoA), Netherlands Development Organization (SNV-Stichting Nederlandse Vrijwilligers), Zambia Agribusiness and Trade Project (ZATP), Adventist Development and Relief Agency (ADRA), World Vision-Zambia, Czech Republic Project, Ministry of Small and Medium Enterprises (MSME)-Department of Cooperatives, Zambia Metrology Agency (ZMA), Zambia Meteorological Department (ZMD), Dairy Association of Zambia (DAZ), Zambia Bureau of Standards (ZABS), and the Accelerate Water and Agricultural Resources Efficiency (AWARE) Project.

Ongoing activities

The GIZ-GIC Project in Zambia is officially scheduled to end in 2025. For three out of the five interviewed partners, the Project-support ended in 2023. GIC activities are ongoing for the other two interviewed partners, with the expectation of ending as per the official Project end-date.

The table below shows the reported ongoing activities among both partners, whose project-support is still going on and those whose project-support has ended: with the expected end-date and whether or not funding is from GIZ.

¹⁵ These were the ones which responded positively to the request for interviews. However, others were not engaged due to financial-resource constraint.



Table 27: Zambia - ongoing GIC activities.

Activity	GIZ-funded? (Yes/No)	Expected End-date
Milk testing, for quality and hygiene, in MFL's Southern Province Laboratory	No	
Pasture production as feed for dairy cattle (so as to enhance milk production)	No	
Bore-hole drilling (on a low level) for cooperative Milk Collection Centres (MCC) and irrigation in pasture production by small-scale farmers	No	
Strategic planning and extension services	No	
Artificial Insemination (AI) breeding services	Yes	
Training in milk hygiene	No	
Milk processing	No	
Certification of Yogurt product	No	Still on-going (to continue since it is dependent on the Cooperative adhering to the condition put in place by the Zambia Bureau of Standards [ZABS] to qualify for certification)
Milk Processing	No	Still on-going (will be manufacturing yogurt even beyond the project life and probably make other milk products)
Supply of irrigation equipment	Yes	Not known
Yogurt Certification	Yes	Before end of December 2024
AI techniques	Yes	Before end of November 2024
Pasture production	No	On going
Milk processing	No	On going
Animal Feed sales/ Agro-shop	No	On going
Farmer Field Schools	No	On going

3.11.2 Changes or Impact of the GIC

On beneficiaries

According to the Project literature, the GIC package in Zambia was and is promoting the following innovations:

Groundnut and soybean value chains

- Conservation agriculture and agroforestry to increase crop diversity and soil fertility
- Use of innovative knowledge dissemination channels such as the farming manual "Better Life Book" and radio show "It's Farm Talk"
- Management of aflatoxin for better quality
- Certified organic groundnuts for higher incomes



- Lead farmer approach as a community-led and cost-efficient extension service and holistic cooperative service portfolio for members
- Community seed banks to ensure access to seed

Dairy value chain

- Climate-smart feeding and commercial fodder production to bridge the dry season
- Dairy business management practices for improved record-keeping
- Climate-smart breeding for climate adaptation
- Milk hygiene to reduce losses
- Access to financial services through Saving and Credit Cooperatives (SACCOs)
- Local processing of milk by cooperatives and holistic cooperative service portfolio for members

Through the implementation of the above innovations, according to project literature, the Project had achieved the following (observed changes or effects), from the start up to July 2024:

- 140,000 small-scale farmers have been trained in sustainable farming approaches in soybeans, groundnuts and dairy;
- Sixty percent (60%) of the trained small-scale farmers have already applied the newly taught climate-smart practices;
- Productivity of soybeans has increased by 21%, while income generated from the groundnuts value chain has increased by 20%;
- More than 400 jobs have been created along the soybeans, groundnuts and dairy value chains; and
- 1.5 million persons have been reached through the interactive radio programmes on the promoted innovations.

From the study, one partner reported having implemented six innovations under the GIC Project, namely: seed multiplication, good post-harvest techniques, crop rotation, agro-forestry, reduction of aflatoxin contamination, and compositing (making and using organic manure).

The table below summarises the reported observed or expected changes or impacts on the beneficiaries, resulting from the implementation of GIC activities or innovations.



Table 28: Zambia - observed or expected changes of GIC innovations on beneficiaries.

Beneficiary	Changes/Impacts	Innovation	Observed or Expected?	Magnitude	Explanation
Small-scale farmers	Improved (better) quality of milk production and hygiene	i. Dairy entrepreneurship (<i>Local processing of milk by cooperatives and holistic cooperative service portfolio for members, and Dairy business management practices for improved record-keeping</i>) ii. Use of milk-testing equipment [Southern Province Laboratory equipped] (<i>Milk hygiene to reduce losses</i>) iii. Development of Dairy Manuals (<i>Dairy business management practices for improved record-keeping</i>) iv. Exposure visit to Germany	Expected	3	
	Improved and increased forage production	Entrepreneurship (<i>Climate-smart feeding and commercial fodder production to bridge the dry season</i>)	Observed and Expected	3	
	Increased mechanization	Use of improved and appropriate mechanization (e.g. equipment for harvesting and small tractors)	Observed	2	
	Improved quality of dairy cows	Breeding (<i>Climate-smart breeding for climate adaptation</i>)	Expected	2	
	Increased financial literacy	i. Financial management ii. Development of Dairy Manuals (<i>Dairy business management practices for improved record-keeping, and Access to financial services through Saving and Credit Cooperatives [SACCOs]</i>)	Observed and Expected	2	Manuals have been developed with practical information on dairy development, business aspects and record-keeping
	More involvement or participation of women (inclusivity)	Organization into cooperatives (<i>Lead farmer approach as a community-led and cost-efficient extension service and holistic cooperative service portfolio for members, and Local processing</i>)	Observed	3	



		<i>of milk by cooperatives and holistic cooperative service portfolio for members)</i>			
	Practicing environmental management/protection	i. Good Post-harvest Techniques ii. Crop rotation iii. Agro-forestry making and using organic manure <i>(Conservation agriculture and agroforestry to increase crop diversity and soil fertility, and Certified organic groundnuts for higher incomes)</i>	Observed	3	There are observed environmental benefits, e.g. reduced deforestation, reduced poaching of wild animals and reduced charcoal-making
	Reduced use of chemical fertilizers	i. Crop rotation <i>(Conservation agriculture and agroforestry to increase crop diversity and soil fertility)</i> ii. Making and using organic manure <i>(Certified organic groundnuts for higher incomes, and Conservation agriculture and agroforestry to increase crop diversity and soil fertility)</i>	Observed	3	
Ministry of Fisheries and Livestock (MFL)-Government Institutions	Improved (better) quality of milk standards and hygiene	Installation and use of milk-testing equipment, in the Southern Province Laboratory <i>(Milk hygiene to reduce losses)</i>	Observed	3	
	Increased knowledge of Staff (especially Extension staff)	i. Enhanced capacity-building <i>(Lead farmer approach as a community-led and cost-efficient extension service and holistic cooperative service portfolio for members, and Use of innovative knowledge dissemination channels such as the farming manual "Better Life Book" and radio show "It's Farm Talk")</i> ii. Development of Dairy Manuals <i>(Dairy business management practices for improved record-keeping)</i> iii. Exposure visit to Germany	Observed and Expected	3	
	Enhanced staff knowledge/capacity	i. Procurement and installation of milk-testing equipment in laboratory	Observed	2	



		(Milk hygiene to reduce losses) ii. Exposure/study visits (to Germany)			
	Enhanced efficiency of laboratory operations	Procurement and installation of modern laboratory equipment, e.g. milk-testing machine (Milk hygiene to reduce losses)	Observed and Expected	3	Veterinary laboratory in Southern Province (Choma) has been well-equipped with new and modern equipment, thereby improving its operations
Small-scale dairy Farmers	Appreciation of dairy farming as a business (mind-set change towards dairy farming)	i. Enhanced extension services and capacity-building (Lead farmer approach as a community-led and cost-efficient extension service and holistic cooperative service portfolio for members) ii. Establishment of Milk Collection Centres [MCC] (Dairy business management practices for improved record-keeping, and Local processing of milk by cooperatives and holistic cooperative service portfolio for members) iii. Exposure/study visits	Observed	2	The number of MCC has increased from 30 when the GIC project started to more than 65
	Improved management of dairy animals	i. Climate-Smart Feeding: pasture production and feeding of animals (Climate-smart feeding and commercial fodder production to bridge the dry season) ii. Enhanced extension services (FFS, disease prevention and control, etc.) and capacity-building (Lead farmer approach as a community-led and cost-efficient extension service and holistic cooperative service portfolio for members)	Observed and Expected	2	The small-scale dairy farmers' demand for various dairy feeds and hay has gone up despite (high) current price due to the effect of climate change
	Increased incomes	i. Enhanced milk quality and hygiene [procurement and use of milk-testing equipment] (Milk hygiene to reduce losses)	Observed and Expected	2	Farmers are: ✓ building improved houses ✓ buying pure dairy breeds ✓ Demand for machinery such as Chaff cutter



		ii. Pasture production and machinery business model (Climate-smart feeding and commercial fodder production to bridge the dry season)			
	Appreciation and use of weather information	Dissemination of weather data and information-forecasting [in collaboration with the Department of Meteorology] (Lead farmer approach as a community-led and cost-efficient extension service and holistic cooperative service portfolio for members, and Use of innovative knowledge dissemination channels such as the farming manual “Better Life Book” and radio show “It’s Farm Talk”)	Observed	3	✓ Weather information is translated and disseminated in different local languages ✓ WhatsApp Group has been created, with about 500 members (small-scale farmers) for dissemination of weather information
	Increased uptake of Agricultural Insurance	i. Enhanced extension services ii. Dissemination of weather data and information	Observed	2	
	Milk delivered in milk cans	Milk hygiene (Milk hygiene to reduce losses)	Observed and expected	2	Farmers understand the importance milk hygiene
	Construction of milking parlours among dairy cooperatives farmers	Milk hygiene (Milk hygiene to reduce losses, Dairy business management practices for improved record-keeping, and Local processing of milk by cooperatives and holistic cooperative service portfolio for members)	Observed	1	High cost of building materials since production has gone down due to effects of climate change
Dairy Cooperative Management	Improved Cooperative income	Milk processing and Agro-shop (Local processing of milk by cooperatives and holistic cooperative service portfolio for members, and Dairy business management practices for improved record-keeping)	Observed and expected	2	The dairy cooperative is making extra income from yogurt making and the sale of feed and drugs to the farmers
Small-scale dairy Farmers and MCC	Improved hygiene standards within milk collection and bulking areas	Enhanced milk hygiene practices (Milk hygiene to reduce losses)	Observed	2	Few farmers are bringing milk in plastic containers and there is reduced milk rejection from the bulk buyers



Dairy Cooperative and milk Collection Centre Management	Scaling up of milk processing and storage capacity	Milk processing <i>(Local processing of milk by cooperatives and holistic cooperative service portfolio for members)</i>	Observed	3	Most equipment for milk processing and storage is established at the MCC and is in the process of certification
MCC	Good record management and storage	Dairy cooperative business model [record keeping] <i>(Dairy business management practices for improved record-keeping)</i>	Observed	2	Record-keeping has improved at the Dairy Cooperative
Batoka Dairy Cooperative MCC	Improved income for the dairy cooperative MCC and yogurt certification	Dairy cooperative business model <i>(Dairy business management practices for improved record-keeping, and Local processing of milk by cooperatives and holistic cooperative service portfolio for members)</i>	Expected	2	The profit is good from selling processed yogurt than raw milk

Note: The innovations written in *italics* is as per interpretation or understanding of the Author, based on the literature descriptions. Rating: 1 "low" 2 "medium" 3 "high")

On the GIC partner organizations

Table 3 shows the summary of the observed or expected changes or impacts due to GIC interventions, on the GIC Partners, as reported by the interviewed respondents.

Table 29: Zambia - observed or expected changes of GIC innovations on partner organizations.

Changes/Impacts	Innovation	Observed or Expected?	Magnitude	Explanation
Improved (better) quality of milk standards and hygiene	Installation and use of milk-testing equipment	Observed	3	Southern Province (Choma) Laboratory equipped with milk-testing facilities
Increased knowledge of Staff (especially Extension staff)	i. Enhanced capacity-building ii. Development of Dairy Manuals	Observed and Expected	3	Ministry staff trained in various professional areas, e.g. breeding, nutrition of dairy animals, pasture production, health of animals, humans



	iii. Exposure visit to Germany			and environment, use of specific equipment, participation on Dairy Expert Group and exposure visits (Germany)
Increased number of participating households		Observed	3	Number of participating households increased from 120,000 to 335,000
Functioning Cooperatives		Observed	2	
Increased seed multiplication and seed security	Seed Multiplication (Community seed banks to ensure access to seed)	Observed	3	80% of Cooperatives have seed banks
Increased exports of processed products, from raw commodities bought from small-scale farmers	i. Good Post-harvest Techniques ii. Crop rotation (<i>Conservation agriculture and agroforestry to in-crease crop diversity and soil fertility</i>) iii. Agro-forestry (<i>Conservation agriculture and agroforestry to in-crease crop diversity and soil fertility</i>) iv. Reduction of aflatoxin contamination (<i>Management of aflatoxin for better quality</i>) v. Compositing (making and using organic manure)- (<i>Conservation agriculture and agroforestry to in-crease crop diversity and soil fertility, and Certified organic groundnuts for higher incomes</i>)	Observed	3	More than 20 processed products are exported
Enhanced collaboration with other partners in implementation of activities to achieve DAZ goals		Observed and Expected	2	



Increased demand for pasture seeds, and pasture production and utilization	Climate-Smart Feeding (<i>Climate-smart feeding and commercial fodder production to bridge the dry season</i>)	Observed and Expected	2	More farmers demanding for seeds to plant
Few cases of milk rejection from bulk buyers	Enhanced milk hygiene, due to Milk parlour construction (<i>Milk hygiene to reduce losses</i>)	Observed	2	New farmers joining dairy farming requires capacity building in milk hygiene
Few farmers delivering milk in plastic containers	Enhanced milk hygiene (<i>Milk hygiene to reduce losses</i>)	Observed	2	Only new farmers are delivering in plastics
Less disease outbreaks	Herd Health	Observed	2	Few diseases reported among the farmers e.g. tick-borne diseases
Scaling up of yogurt production and financial improvement at the Milk Collection Centre (MCC)	Dairy Cooperative Business model (<i>Local processing of milk by cooperatives and holistic cooperative service portfolio for members, and Access to financial services through Saving and Credit Cooperatives [SACCOs]</i>)	Observed and Expected	3	We can store more than 20,000 yogurt bottles of various sizes
Increased milk volumes	Climate-Smart Feeding-Pasture and feed utilization (<i>Climate-smart feeding and commercial fodder production to bridge the dry season</i>)	Observed	2	New and old farmers increased the purchase of commercial feed
Improved grading and pricing of raw milk	Milk quality Laboratory-testing and hygiene (<i>Milk hygiene to reduce losses</i>)	observed	2	Our milk is graded A
Improved dairy breeds	Smart-breeding, using AI Techniques (<i>Climate-smart breeding for climate adaptation</i>)	observed	1	Not all farmers can access the AI services as AI kits can only be accessed during a certain period of the year
Improved hygiene at the Milk Collection Centre (MCC)	Milk hygiene (<i>Milk hygiene to reduce losses</i>)	Observed and Expected	2	Reduced milk sour, smell and flies



Reduced milk rejection cases	Milk hygiene <i>(Milk hygiene to reduce losses)</i>	Observed	2	Milk is not frequently rejected by bulk buyers
Improved milk quality and increased milk products	Milk processing <i>(Local processing of milk by cooperatives and holistic cooperative service portfolio for members)</i>	Observed	2	The cooperative is in the process of getting certification in milk processing
Improved record keeping	<i>(Dairy business management practices for im-proved record-keeping)</i>	Observed	2	
Increased the quantities of milk for processing	Storage	Observed and Expected	2	Without the cold-room, they could not store large quantities of milk due to spoiling, but now they can increase the quantities of milk for processing, as they have a cold-room to store more than 10,000 bottles of yogurt after processing

Note: The innovations written in *italics* is as per interpretation or understanding of the Author, based on the literature descriptions. (rating: 1 "low" 2 "medium" 3 "high")



Cooperation between GIC partner organizations

After the end of the GIZ-funded activities for three partners whose GIC-support ended in 2023, two of them have continued cooperation with other GIC partners. The two partners who are still implementing the GIC Project, are planning to continue their cooperation with GIC partners after the end of the GIZ-funded activities. Cooperation has continued and is planned to continue in various ways, notably in:

- Pasture production and utilisation involving small-scale farmers, capacity-building of extension staff and services, and in Farmer Field Schools (FFS);
- the breeding for improved dairy breeds, especially by promoting the Jersey breed through Artificial Insemination; and promotion of the dairy value chain among small-scale farmers, especially in milk processing;
- the development and/or implementation of the National Strategy on Zambia Dairy Transformation Informal Extension coverage;
- Cooperative governance and dairy farming as a business;
- Cattle restocking, and mentoring and coaching in cooperative business model;
- Certification of different milk products produced by the Dairy Cooperatives;
- Ensuring that correct weights and measurements are complied with;
- Timely dissemination of weather information and messages in various local languages on radio and online platforms;
- Market linkages and coordination of activities in the dairy value chain (taking dairy farming as a business), in Southern Province;
- Milk quality-testing and grading at the laboratory of the Ministry of Fisheries and Livestock, in Southern Province

From the Project literature, it is reported that, in order to anchor and ensure the continuation of the GIC innovations in the partner structures for a successful and sustainable uptake the GIC Project has continuously been working with the public and private partners in: (i) identifying new innovations that work in the specific local context, and (ii) disseminating the knowledge on how to apply these innovations, through conducting regular trainings.

From the study, all the interviewed partners reported that various measures have been and are being put in place by the GIC Project and its partners, as an exit strategy.

The following are among the measures reported by the respondents as having been and are being taken for sustainability of the GIC interventions, by both the GIC Project and Partners:

- Nearly all the innovations or activities carried out under the Project, e.g. extension service delivery and capacity-building of extension staff, are within the mandate and programmes of the Ministry of Fisheries and Livestock's (MFL), including the Ministry of Agriculture (MoA), and will therefore continue even after the end of GIZ support, however, with reduced funding.



- Both the MFL and the small-scale farmers have directly been involved in the implementation of the GIC activities practically, for ownership and integration into respective routine work.
- One private sector partner reported having persisted with the promotion of the GIC innovations and associated activities, even though it had been making losses from the start until 2023¹⁶, and has resolved to continue implementing the activities, although the GIZ-funding has ended.
- The MFL and one NGO partner have embarked on acquisition and proper maintenance of appropriate and modern equipment and machinery involved in the dairy value chain, as a Mechanization Strategy.
- The GIC Project provided support to the MFL and conducted training of its staff in order to sustainably incorporate all GIC activities, such as FFS, drought resistant pasture production and utilization, and financial literacy, in their usual programmes, including on how to support the Batoka Dairy Cooperative, in particular, after the end of project-funding.

Innovations promoted by the GIC

Not all innovations promoted by the GIC have been adopted and scaled up. The rate of adoption and extent of scaling up also vary among the promoted innovations, for various reasons. The table below shows the top 3 to 5 innovations promoted by the GIC, for each partner, and the reasons for adoption and/or scaling-up, including the extent of adoption or scaling-up, as reported by the interviewed respondents.

¹⁶ The Partner has, however, been making profit from 2023 to date.



Table 30: Zambia - top five innovations adopted and scaled-up and reasons for adoption and scaling-up.

Innovation	Explanation of status of adoption/scaling	<i>Optional:</i> Rough estimate of rate of adoption (including total number targeted)
Nearly all promoted innovations	- Not huge (financial) investment has been injected in the Project, but the innovations have been practical and quite impactful. - Indirectly, innovations have been scaled-up from Southern Province to other provinces (Districts and Camps), through transfer of staff who had been involved in the GIC activities	About 70% of innovations have been adopted and scaled-up
Seed Multiplication	Initially the promoted innovations started in Eastern Province, but have been scaled-up to Central Province (Luano Valley) and Western Province (Kafue National Park)	
Good Post-harvest Techniques		
Crop rotation		
Agro-forestry		
Reduction of Aflatoxin Contamination		
Compositing (making and using organic manure)		
Dissemination of weather data and information-forecasting	Has been scaled up to national level. Weather information is translated and disseminated in different local languages	
Procurement, installation and use of milk-testing machine (modern Laboratory equipment)	Milk processing has been adopted and scaled up: milk standards and hygiene have improved	
Climate-Smart Agriculture (CSA)	Increased planting of drought-tolerant species of grass (e.g. Bracharia and Napia species) for feeding dairy animals. However, there are challenges of sourcing seeds (limited sources-mainly available in Lusaka)	
Breeding- Artificial Insemination (AI)	AI services to be provided by the Dairy Cooperative	Target: more than 100 Dairy farmer members to access AI services
Milk Processing	Increased volumes of milk for processing and currently the certification process of the milk products to increase the market base, is underway	
	✓ Increased number of bottles of made yogurt and are in the process of certifying the yogurt production. ✓ Good profit made from processing milk than selling raw milk	400 litres of milk to be processed per day
	Increased the litres of milk used to make yogurt from 30 bottles per week to 320 bottles per week and certification to increase the market for yogurt to the public	Targeting more than 1,000 bottles per week
Drought resistant pasture production and utilization	✓ Demand from farmers to acquire pasture seeds ✓ Increased demand to purchase hay bales among dairy farmers	50 Cooperative members have adopted the planting pastures; with a target number of



		more than 200 members planting pastures per planting season
(Enhanced) Milk hygiene	Almost all farmers use milk cans to deliver milk to the MCC	Target: more than 200 Dairy farmer Cooperative members should use cans to deliver milk to the MCC
	Few farmers have constructed milk parlours and deliver milk in cans and the environment at the MCC has greatly improved	Targeting more than 150 milking parlours
Dairy Cooperative Business Model	Improved record-keeping and farmers' books are neatly stored. Additionally, signs have been put up at the Cooperative, to show visitors what is happening	Targeting more than 200 milking parlours to be constructed among the members of the Dairy Cooperative



3.11.3 Lessons learned on successes, failures and challenges

A number of lessons, with regard to successes, failures and challenges, have been learnt from the implementation of GIC interventions, in Zambia. The study brought out the following lessons:

- Directly involving small-scale farmers in the implementation of activities enhances their practical knowledge and experience, and thus promoting adoption, scaling up, ownership, and sustainability of interventions.
- Small-scale dairy farmers are empowered to be price-determiners rather than price-takers by having their milk tested before selling.
- Starting engagements (of Project introduction and awareness-creation) at the lower levels of Government/Ministry hierarchy (Province and District), before the Headquarters, slows down project implementation and government collaboration.
- Do not give up and learn from data and mistakes.
- Better to digitalize operations (Go digital).
- Partnerships with cooperatives has increased with continued exports of products, processed from farmers' raw materials.
- Continue improving farmers' livelihoods and protection of natural resources.
- Ensure that products are of high value.
- *Good project working approach*: Project implementation involving a combination of theoretical and practical work, is a better approach for easy knowledge and skills transfer to partners and beneficiaries.
- *Need to adapt to climate change*: it is important to prepare well for adverse climate change effects, especially with increased frequency and intensity of adverse weather conditions.
- *Take a holistic dairy value chain approach*: it is advisable to not only concentrate on one function of the value chain.
- Letting Government to implement most of the activities leads to slowness of Project implementation, due to Government bureaucracy and inertia.
- *Staff capacity-building*: undertake appropriate capacity building for staff development, in various and appropriate professional fields and skills, to improve efficiency, effectiveness and sustainability of project activities. Including recruitment of interns, who may be employed at the end of internship.
- Recruitment of trustworthy and hardworking staff, able to implement activities according to the plan and timely, enhances efficiency, effectiveness and Project-delivery.



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