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Ecosystem Assessment of Food, Land, and Water Actors in the Humanitarian, Development, and Peace Nexus



INITIATIVE ON
Fragility, Conflict,
and Migration

Hangyul Song, Clara Sarangé, Anne Oderoh, Hauke Dahl,
and Inga Jacobs-Mata

December 2023



Executive Summary

1.5 billion people live in fragility and conflict-affected settings (FCAS) and they face an increased risk of food insecurity and poverty trap. A systems approach in collaboration with innovators in FCAS is needed to produce practical and inclusive solutions that can improve the resilience of food, land, and water systems (FLWS). CGIAR is in the unique position to produce transformative policies, programming, and market strategies to bring science-driven innovation to improve resilience among FCA communities and create a bridge between the humanitarian, development, and peace (HDP) nexus.

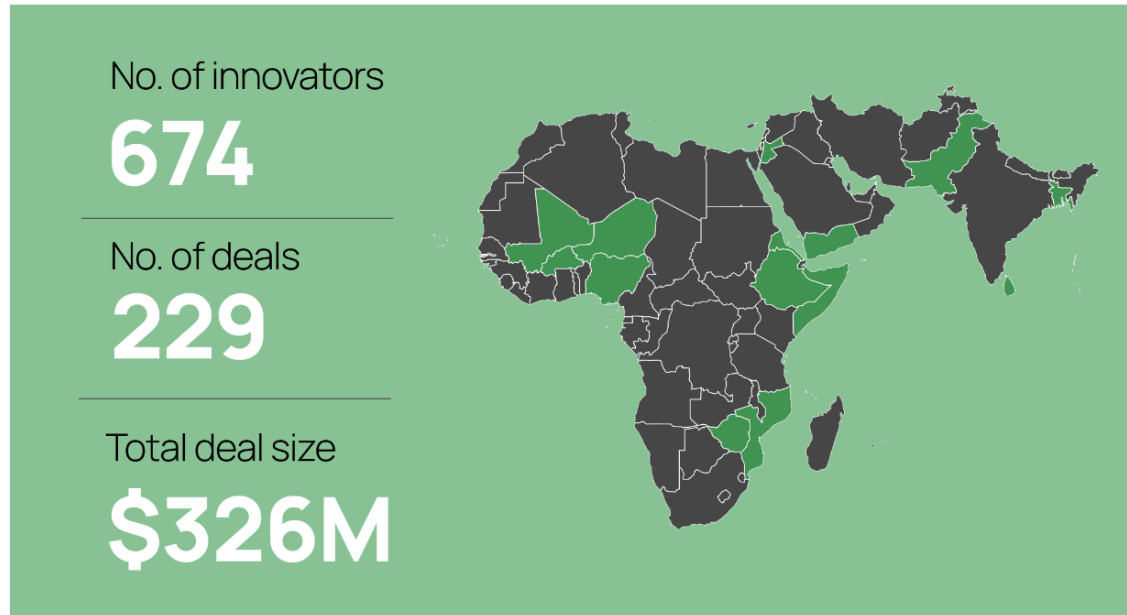
This market report conducts a market assessment across 14 countries in Africa, the Middle East, and South Asia to inform a science-driven acceleration programme to scale CGIAR innovations in FCAS. The analysis in the report is from a newly developed database on FLWS-HDP innovation ecosystem actors, which includes 600+ innovator data covering 90+ solution types and 200+ funding supporters, including investors, governments, NGOs, hubs, and other collaborative ecosystem enablers. Additionally, the report draws insights from consultations with experts in the ecosystem ranging from CGIAR practitioners to innovation hubs and innovators (Chapter 1).

The ecosystem mapping shows that the FLWS-HDP innovation ecosystem is still nascent in many FCA countries, and is largely concentrated on food production. Water resources, migration, and anticipatory action innovations only take up 20% of all innovations. Financial support to enable private innovators has been rising and 25% of the innovators mapped in the selected countries have raised funding amounting to over \$330M as of November 2023, with investors from the private sector paving the way and with public-private partnerships (PPPs) increasingly playing an important role. Funding support from private investors and PPPs support early-stage innovation development by creating hubs, de-risking funding by co-investing with the private sector, and directly providing financial support to the innovators. International donors, governments and investors from the Global North are also prevalent in the ecosystem as 90% of actors supporting innovators are from outside the FCA countries. Local actors often work with international actors to implement programmes, co-invest, and help source high-impact innovators. There is little evidence of international research organisations' activities in the FCAS so far (Chapter 2).

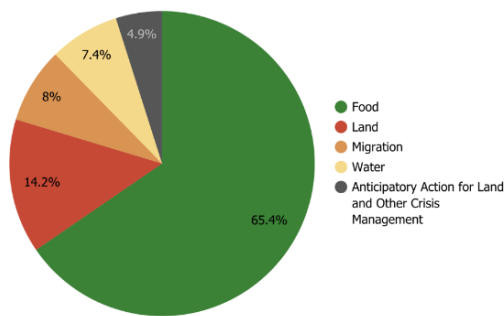
Developing a sustainable FLWS-HDP innovation ecosystem in FCAS is met with challenges related to limited infrastructural resources, value chain disruptions, and heightened security risks. However, opportunities also exist, especially when innovators flexibly adapt innovations to address local challenges, and in settings where the solutions become tools to better facilitate and coordinate humanitarian, government, and private sector initiatives. Hence, supporting private sector innovation should prioritise localising solutions for the specific context to increase longer-term sustainability. Research organisations should support by developing systems to bring science to sector value chains and becoming expert support for innovators. Lastly, partnerships with governments, local actors, and international NGOs should be leveraged to bring innovations to tackle local challenges (Chapter 3).

Finally, the report provides an overview of the macroeconomic and FCA context and an analysis of the FLW-HDP innovation ecosystem for each of the 14 countries. The country overviews highlight that each country has a unique set of challenges and opportunities for developing a resilient innovation ecosystem, yet there are strong signals that innovators, support initiatives, and actors are making an impact in improving the conditions for FLW and HDP systems in FCA contexts (Chapter 4).

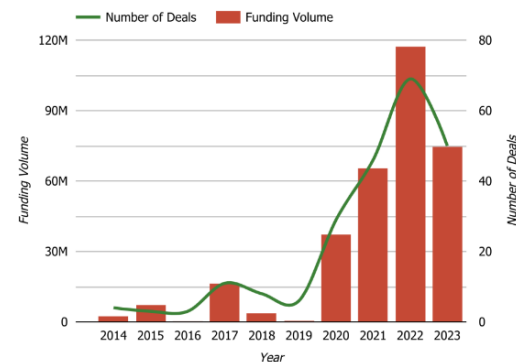
FCAS Innovation Overview



Innovators by Categories



Funding Across the Years



Key stakeholders



About the Institutions

CGIAR is the largest agriculture innovation network with a research portfolio of US \$900 million, over 3000 partners and clients in 70+ countries focused on enhancing food and nutrition security through a science-based approach to emerging development issues. The main scientific areas of focus include supporting food systems transformation, driving sustainable land and water use, supporting resilient agri-food systems, and creating genetic innovation through crop breeding and seed systems for adaptation of food and farms to meet goals for poverty reduction, gender equality, nutrition, climate, and the environment. Its research is carried out by 13 CGIAR Centers/Alliances in close collaboration with hundreds of partners, including national and regional research institutes, civil society organisations, academia, development organisations, and the private sector.

The International Water Management Institute (IWMI) is an international, research-for-development organization that works with governments, civil society and the private sector to solve water problems in developing countries and scale up solutions. Through partnership, IWMI combines research on the sustainable use of water and land resources, knowledge services and products with capacity strengthening, dialogue and policy analysis to support implementation of water management solutions for agriculture, ecosystems, climate change and inclusive economic growth. Headquartered in Colombo, Sri Lanka, IWMI is a CGIAR Research Center with offices in 16 countries and a global network of scientists operating in more than 55 countries.

Briter Bridges is a fast-growing market intelligence and research firm focused on emerging economies. Briter has built the largest collection of visual publications on Africa and underserved markets and regularly provides data and insights to corporates, development finance institutions, governments, and investors. Briter's proprietary business data platform, Briter Intelligence, is regularly used by thousands of public and private organisations ranging from the World Bank to Amazon and governments.

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INITIATIVE ON
**Fragility, Conflict,
and Migration**

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INITIATIVE ON
**Diversification in East
and Southern Africa**

The report is informed by the collaboration between the CGIAR Initiative on Fragility, Conflict, and Migration and the CGIAR Initiative on Diversification in East and Southern Africa.

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Foreword

Hunger and severe malnutrition are surging in fragile and conflict-affected settings (FCASs), which often struggle to sustain resilient food, land, and water systems (FLWSs). For the 1.5 billion people living in FCASs, livelihood challenges and rising food, fertiliser, and input prices are compounded by climate change, unsustainable resource consumption, poor governance, and weak social cohesion. Conflict and forced migration often result from, and further escalate, these challenges, economic disruptions, such as those caused by COVID-19 and the Ukraine-Russia War, are sparking the risk of food and nutrition crises and poverty and conflict traps. Nearly 670 million people are projected to face hunger in 2030 — 8 % of the world population, and the same as in 2015 when the 2030 Agenda and UN Sustainable Development Goals (SDGs) were launched.

The Fragility, Conflict, and Migration (FCM) Initiative is a global CGIAR project with the aim to (1) strengthen anticipatory action and governance to mitigate the impact of compound crises; (2) bridge emergency operations with long-term sustainability principles; (3) generate evidence to guide effective policies and programming to promote stability and women’s empowerment; and (4) accelerate innovations that address humanitarian-peace-development (HDP) priorities alongside local innovators. A systems approach in partnership with innovators working in FCASs is needed to devise practical solutions that promote resilience, gender equity and social inclusion. CGIAR is uniquely positioned to produce effective and transformative policies, programming and market strategies to enhance FLWS resilience in FCASs facing migration-related challenges, and to promote social equity, conflict mitigation, and peacebuilding.

The “Ecosystem Assessment of Food, Land and Water Actors in the Humanitarian, Development and Peace Nexus” is a market report that focuses on 14 countries in Africa, the Middle East and South Asia to inform the development of a science-driven “Stability-and-Peace Accelerator”, which aims to support FLWS innovators in FCASs to scale CGIAR solutions. Beyond that, this report presents the first-of-its-kind attempt to classify and categorise private enterprises operating in FCAS. Leveraging Briter Bridges’ market knowledge and data analytics, this collaborative effort is an insight into the vast potential of the private sector to create meaningful change in the world’s most vulnerable spaces.

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Abbreviations

2B	to-Business
ADB	Asian Development Bank
B2B	Business-to-Business
B2C	Business-to-Consumer
B2G	Business-to-Government
BAMIS	Bangladesh Agro-Meteorological Information System
CFA	Communauté Financière Africaine
DAI	Development Alternative Incorporated
DFI	Development Finance Institutions
ESO	Entrepreneur Support Organisation
EU	European Union
FAO	Food and Agricultural Organisation
FCAS	Fragility and Conflict-Affected Settings
FCM	Fragility, Conflict, and Migration
FLWS	Food, Land, and Water Systems
FLWS-HDP	Food, Land, and Water Systems in Humanitarian, Development, and Peace Nexus
GIZ	The Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
HDI	Human Development Index
HDP	Humanitarian-Development-Peace
IFAD	International Fund for Agricultural Development
IFC	International Finance Corporation
IRC	International Rescue Committee
MNO	Mobile Network Operator
NGO	Non-Governmental Organisation
NIP	Nigerien Irrigation Program

SAPP	Smallholder Agribusiness Partnership Programme
SATG	Somali Agriculture Technical Group
SME	Small and Medium Enterprise
SSA	Sub-Saharan Africa
P2P	Peer-to-Peer
PE	Private Equity
PPP	Public-Private Partnership
VC	Venture Capital
UN	United Nations
UNDP	United Nations Development Programme
UNHCR	United Nations High Commission for Refugees
UNICEF	United Nations International Children's Emergency Fund
UN OCHA	United Nations Office for the Coordination of Humanitarian Affairs
USAID	United States Agency for International Development
WB	The World Bank
WFP	World Food Programme

Key terms

Term	Definition
HDP nexus	The Humanitarian-Development-Peace (HDP) nexus is about creating a bridge between humanitarian response, peacebuilding, and more long-term development efforts. It is a concept and structure rooted in the idea that all three are simultaneously needed to address vulnerability and support resilience. One of the underlying goals of this approach is to address systemic challenges to achieve long-term and sustainable peace and development.
FCAS	Fragility is characterised by a very low level of institutional governance that leads to incapacity to maintain peace and foster development. In contrast, conflict is characterised as insecurity caused by deadly force by a group that harms civilians intentionally or collaterally. ¹ FCAS are home to 1.5 billion people globally, ² and the total number of extreme poor in FCAS may surpass the number of extreme poor in non-FCAS settings by 2024. ³ FCAS are also disproportionately affected by global crises such as climate change and epidemics like COVID-19, ⁴ making assistance and building in FCAS ever more complex yet necessary. Weak governance, conflict and violence create economic disruptions, forced migration, and blocked access to resources for both those who migrate or stay behind.
FLWS	Food, Land, and Water systems (FLWS) is a concept that considers food systems as an interlinked relationship between agriculture, upstream elements and downstream results. ⁵ Programming using the FLWS framework is important to address challenges in the food systems while considering the impact of those programmes on interconnected environmental and ecological systems.
FLWS-HDP	This concept is used to describe the broader categories of innovations that impact the Food, Land, and Water Systems in the Humanitarian, Development, and Peace Nexus. This report utilises the term FLWS-HDP innovations to describe innovations that offer innovative solutions in food, land, water, migration, and anticipatory actions for land and other crisis management categories.

Source: Authors' analysis

¹ [World Bank Classification of Fragility and Conflict Situations \(FCS\)](#) for World Bank Group Engagement.

² CGIAR Initiative on Fragility, Conflict, and Migration (2023), "[Fragility, Conflict, and Migration: A new CGIAR Initiative for a fragile world](#)"

³ World Bank (2023), "[Fragility, Conflict & Violence Overview](#)"

⁴ World Bank (2023), "[Fragility, Conflict & Violence Overview](#)"

⁵ CGIAR (2021), "[Exploring the Future of Food, Land, and Water Systems](#)"

Chapter 1. Introduction

In 2023, more than 783 million people are facing chronic hunger worldwide. The scale of the crisis is bigger than ever before, with urgent assistance needed in several places across the globe. Some of the biggest drivers of the current situation are conflict, climate-related events, and economic shocks, with little sign of slowing down as we enter the new year.¹

Violence and conflict are some of the biggest contributors to food insecurity, constraining the availability of resources and capacity to create sustainable food systems and maintain development objectives. This is worsened by ongoing risks from climate-related events and disasters. This is particularly the case in many parts of Africa, Asia, and the Middle East, where food insecurity levels already affect large parts of the population, and ongoing or prevalent fragility leads to continuous cycles of poor governance and vulnerability to shocks. Moreover, the gaps between humanitarian support and longer-term development and peace-building support can further disaggregate the resources needed in fragility and conflict-affected settings (FCAS). While significant pain points remain, both public and private sector innovators are creating stronger and more resilient communities by addressing the gaps caused by conflict and other external shocks.

In 2023, CGIAR launched the OneCG Fragility, Conflict, and Migration Initiative² to address complex challenges on food, land, and water systems (FLWS) in fragility and conflict-affected settings. The new initiative aims to provide targeted support for creating more resilient FLWS with longer-term stability and connections in the humanitarian, development, and peace (HDP) nexus embedded in the design. This report is the first of its kind to support this new initiative, particularly the *Accelerate* work package, that focuses on accelerating innovations in partnership with local innovators including women and youth. This report provides a comprehensive overview of private and digitally-enabled innovators and the surrounding actors specialising in FLWS-HDP innovation ecosystems in 14 FCAS countries³. **The purpose of this report is to inform the pipeline of innovations, stakeholder types, and support needs to scale CGIAR innovations in collaboration with private innovations at the Food, Land, and Water System (FLWS) and Humanitarian, Development, And Peace (HDP) nexus across selected fragility and conflict-affected settings (FCAS).** Specifically, it aims to:

- Map out different actors involved in stimulating and growing FLWS-HDP innovations in the FCAS.
- Assess the role of different actors and explore how FLWS-HDP innovators contribute to increasing resilience in food production, land management, water resources, and migration, as well as anticipatory action for crisis management.
- Identify existing activities that specialise in supporting FLWS-HDP innovations in the FCA context to extract learnings, and explore opportunities for stimulating sustainable development, peace-building, and crisis response efforts.

The report is divided into four core chapters:

¹ WFP (2023), “[A Global Food Crisis](#)”

² CGIAR Initiative on Fragility, Conflict, and Migration (2023), “[Fragility, Conflict, and Migration: A new CGIAR Initiative for a fragile world](#)”

³ The emphasis is on players engaged in the innovation ecosystem as opposed to any actor active in the FLW space.

- **Chapter 1** provides background and context for this study, as well as an overview of the methodology and scope;
- **Chapter 2** offers a mapping of the FLWS and HDP landscape across selected markets in the three regions of interest: Sub-Saharan Africa, Middle East, and South Asia;
- **Chapter 3** gives a synthesised assessment of the FLWS and HDP ecosystem and gives strategic recommendations for synergies, partnerships, and opportunities for a more connected and specialised FLWS and HDP ecosystem; and
- **Chapter 4** provides a deep dive in the background and the state of innovation across the 14 countries in these regions.

1. A. Scope of research

Geographies

The research is targeting 14 priority countries across sub-Saharan Africa (Burkina Faso, Eritrea, Ethiopia, Mali, Mozambique, Niger, Nigeria, Somalia, and Zimbabwe), the Middle East (Jordan, Yemen), and South Asia (Bangladesh, Pakistan, Sri Lanka).

Innovation Categories

The mapping targets digitally- and/or tech-enabled innovations and solutions within the FLWS ecosystem and the HDP Nexus. Each innovator's solution offerings are categorised into one of the FLWS-HDP Innovation categories specified below. Innovators that offer more than one solution are assigned one main solution based on their operations and history of innovation development (i.e., the solution that they first developed or the largest solution offering at the time of research). The innovation categories covered in this research are as follows:

- **Food:** innovation related to the production, processing, and distribution of food, as well as agriculture-related activities and products.
- **Land:** innovations that facilitate the sustainable management of land, including private and shared areas and resources.
- **Water:** innovative tools and equipment that provide access to clean and accessible water.
- **Migration:** innovations that equip and support individuals and families who are moving between locations voluntarily or involuntarily.
- **Anticipatory Action for Land and Other Crisis Management:** solutions that forecast climate-related events, and offer either mitigating or adaptive products to create resilient communities.

See a full list of solutions considered in the [solution taxonomy](#).

Actors

This research focuses on innovators and other actors such as investors, governments, non-governmental organisations (NGOs), and hubs that have provided financial support for FLWS-HDP innovations in the FCA countries. Briter Bridges' data and analytics tool tracks multiple funding partners involved in a deal and includes Entrepreneurial Support Organisations (ESOs) such as incubators and accelerators and NGOs that provide financial and in-kind support. Actors can be either local or global with a local footprint. The full list of actor types observed in this research can be found in the [actor taxonomy](#).

1. B. Research areas

This project is approached through the lens of 5 key research areas and associated questions:

- **State of the ecosystem:** What is the current landscape and potential impact of FLWS and HDP solutions in FCA countries that can reveal differing challenges, priority areas, emerging trends, available support for innovators, and the state of gender and youth inclusion?
- **Actor identification:** Who are the actors engaged in the FLWS and HDP innovation ecosystem and what role are they playing?
- **Opportunities and bottlenecks for growth:** What opportunities and challenges exist for scaling FLW and HDP innovations, including scalable products, specialisation strategies, and the key barriers faced by actors operating in FCA environments?
- **CGIAR's support role:** What are the actionable opportunities for CGIAR's science-driven "Stability-and-Peace Accelerator" to promote sustainable FLW and HDP innovation in FCA countries and contexts?
- **Synergies through partnership:** How can partnerships drive more effective contextualisation, and what role can the CGIAR play in facilitating collaborations among key actors in the humanitarian/ development, public, and private sectors?

1. C. Data Sources & Methodology

The research will draw analysis from both quantitative and qualitative sources to address the above research questions:

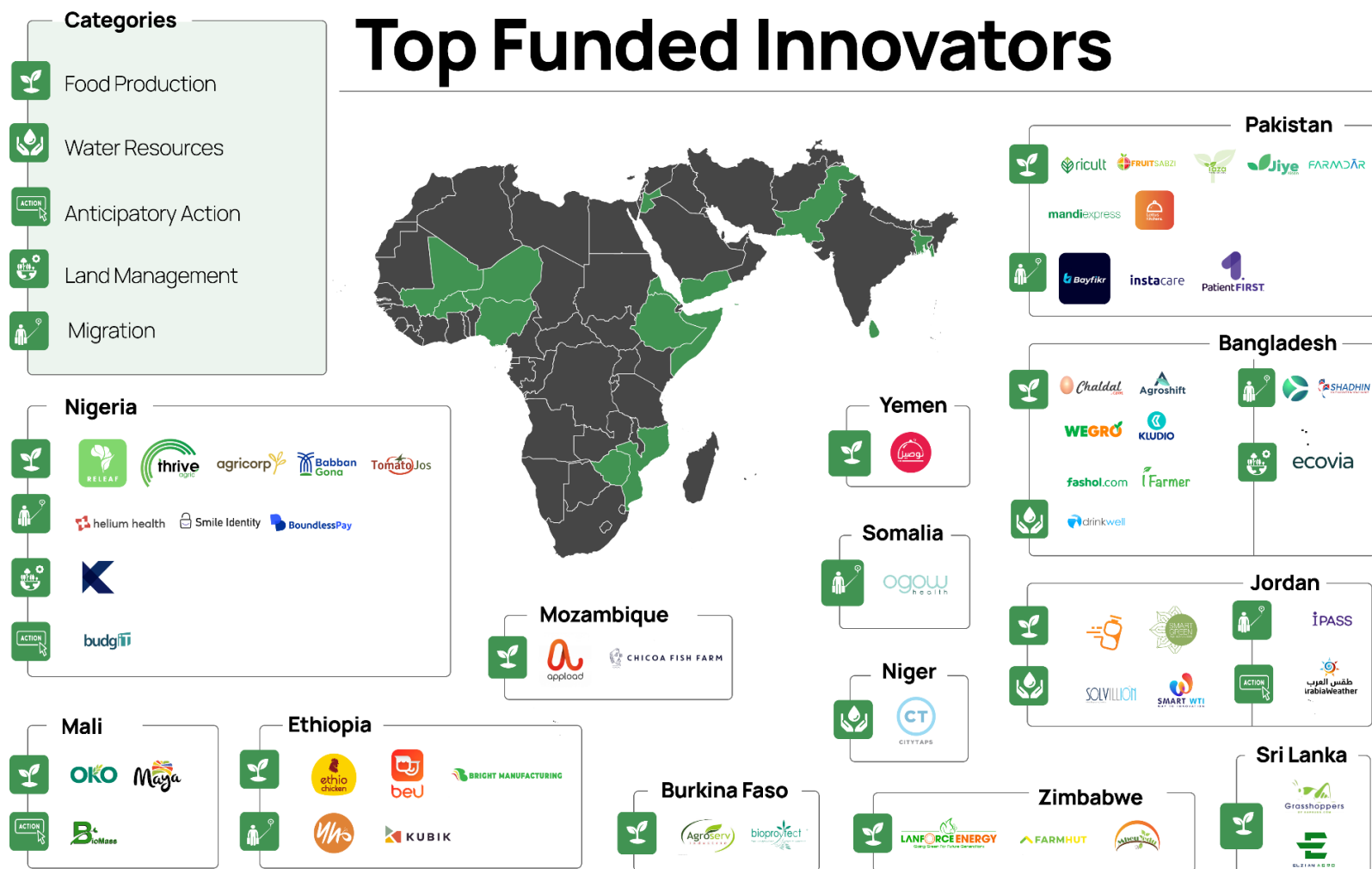
- **Briter Intelligence** aggregates information on innovators and investments in innovators between 2015-2023. Deal-level and firm-level data from 14 FCAS countries are extracted and cleaned to only include relevant FLWS and HDP solutions.
- **Secondary desk research** on academic and industry-specific research is conducted to provide macroeconomic assessment and to find additional actors and case studies.
- **Stakeholder interviews** are carried out with 9 ecosystem stakeholders in private, public, and humanitarian spaces and 4 of CGIAR FCM work packages to build up the case studies and to supplement the quantitative analysis (see [Contributors](#)). Stakeholder interviews are key sources of qualitative information that help connect and synthesise data collected from other sources.

There are certain considerations to note in the methodology. First, most entrepreneurs do not build innovations that only target FCA beneficiaries. Instead, they build from the perspective of solving local challenges and often to become commercially viable. This was reflected during the data collection process where companies seldom advertised themselves as FCAS-related companies but rather showed that their solution could be adapted to various users including those in FCAS. Additionally, FLWS and HDP innovators are not always in similar sectors, and innovators who work in both FLWS and HDP settings are rare. Funding information relies on publicly available funding information, meaning that the data captures more equity funding than traditional SME debt funding.

Chapter 2. Ecosystem Mapping

This chapter provides mapping and a summary of findings from the identified data on the FLWS-HDP innovation ecosystem across 14 countries. First, a mapping of the innovation ecosystem is presented to showcase the FLWS-HDP innovator and actor ecosystem from a bird's eye view, followed by an analysis of the innovators, solutions types, and funding trends. The second part of Chapter 2 presents an analysis of the enabling support environment by examining actors involved in the innovation ecosystem. Finally, the key findings section summarises relevant key points from the analysis. This chapter provides an overview of all 14 countries and a more detailed analysis of the country-level contexts can be found in [Chapter 4](#).

2. A. Innovator mapping by top-funded innovators



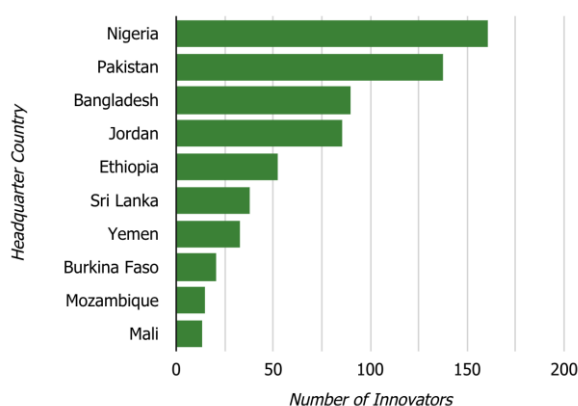
*Eritrea is not shown on this map due to lack of funding information in Eritrean innovators

2. B. FLWS and HDP Innovators in FCA Countries

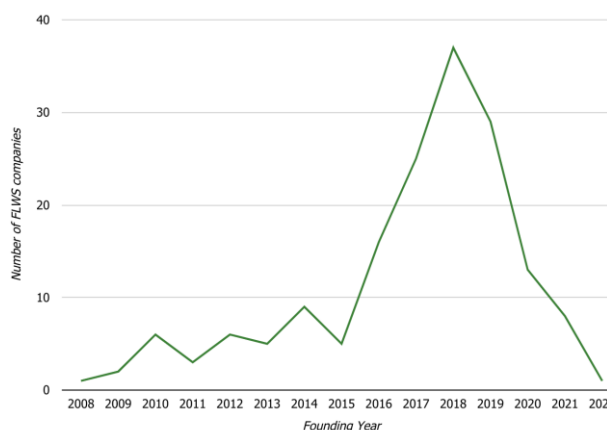
FLWS-HDP innovation is happening in FCAS but is still in the early stages and with high variation across countries.

Innovation at the nexus of FLWS and HDP is already happening in Fragility and Conflict-Affected Settings. The analyzed data shows that there are more than 600+ companies offering products or services in the FLWS and HDP in the 14 FCA countries. However, it is not happening equally and it is still in the early stages. Figure 1 shows that countries with more mature innovation ecosystems such as Nigeria, Pakistan, and Bangladesh have multiples more FLWS-HDP innovators than less mature markets and small ecosystems such as Zimbabwe, Mali, Mozambique, and Somalia. Figure 2 shows that nearly half of the FLWS-HDP innovations were founded in the last five years.

Figure 1: Number of FLWS-HDP innovators by FCAS countries Figure 2: FLWS-HDP innovators by founding year



Source: Briter Intelligence Data (Q1 2015 - Q3 2023)



Source: Briter Intelligence Data (Q1 2015 - Q3 2023)

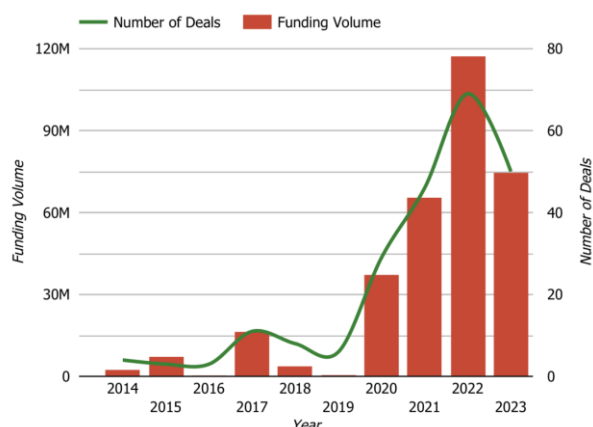
Private sector funding to support the FLWS-HDP innovators is on the rise. The total funding size for the FLWS-HDP innovation ecosystem amounts to \$330 million. Over 20% of the innovators have a demonstrated record of fundraising, and Figure 3 shows that the majority of these deals occurred in recent years between 2020 and 2023. This recent uptake in private sector funding is a positive sign that private sector actors are seeing the potential in fostering growth in the FLWS-HDP innovations despite the challenges posed by the fragility and conflicts present in these ecosystems. Private sector involvement encourages innovators to develop more sustainable business models to distribute and scale innovations.

Private sector funding contributes to scaling FLWS-HDP innovations in the FCAS ecosystem, especially in supporting early-stage innovations. Mobilising private funding at the early stage enables innovators to test and grow innovations in the market in ways that already pushed them towards sustainability. The disclosed funding information⁴ shows that the majority of the funding is geared towards early-stage innovation development. Figure 4 shows that more than 50% of deals have ticket sizes under \$500K and are in the pre-seed to series A stages. This highlights the nascent nature of the FLWS-HDP ecosystem in most of the FCAS countries. Mobilising private funding at the early stages enables innovators to test the innovations in the market and package them in ways that suit the

⁴ Among all deals captured, 72% have disclosed funding size and 50% have disclosed the funding stage.

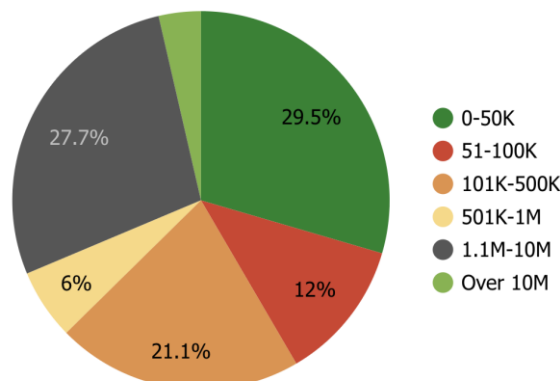
users in the FLWS-HDP value chain. Entrepreneurial capacity development through funding is a sign of bottom-up economic activities that can contribute to resilience relevant to the HDP nexus.

Figure 3: Funding in FLWS-HDP innovators



Source: Briter Intelligence Data (Q1 2015 - Q3 2023)

Figure 4: Deal size breakdown



Source: Briter Intelligence Data (Q1 2015 - Q3 2023)

Scaling innovators do exist and they are attracting a lot of funding. While the majority of funding is for early-stage innovations in the FLWS-HDP ecosystem, more than 30% of the funding has ticket sizes over \$1M. The largest deals identified are in Nigeria where the capital market and the innovation are more developed than in all the other FCA countries in the study. Two main areas where Nigerian innovators are attracting investor interest are (1) developing the connection between farmers and the market and (2) fintech-adjacent innovations such as crop insurance. Examples of the former include ThriveAgric, which raised \$56.4M in debt to expand their agricultural operating system into other African countries⁵, and Agricorn, which raised a pre-series A funding of \$17.5M to expand their agronomic practice services and processing capacities⁶. Examples of (2) fintech-adjacent innovations include Smile Identity, which raised over \$20M from private investors to expand their AI-based ID verification technology⁷, and farmer credit service Babban Gona, which raised \$10M from Citi Bank⁸. In other FCA countries, agro-processing companies such as Ethiopia's Ethiochicken and Burkina Faso's AgroServ Industry have attracted repeated investor interest, although further evidence generation is needed to understand the impact of commercial agro-processing companies. Nevertheless, these large deals signal that FLWS-HDP innovations have the potential to scale and that private investors can play a part in providing working capital to enable further growth.

While the private sector plays a role, public-private partnerships are critical for de-risking and developing the FLWS-HDP innovation ecosystem. Public sector funders play an important role in mobilising private sector funding by de-risking investments. This is particularly important in FCA settings where market risks are heightened compared to less FCA countries. They are often involved in both small and large-sized deals. For example, Thrive Agric's \$56.4 deal included a co-investment from the United States Agency for International Development (USAID) and Babban Gona's \$10M deal was made possible by a partnership between the US Development Finance Corporation, the

⁵ Disrupt Africa (2022), "[Nigeria's ThriveAgric raises \\$56.4m debt funding to accelerate African expansion plans](#)"

⁶ Tech Cabal (2021), "[Agricorn raises \\$17.5m pre-series A fund to enhance global food system](#)"

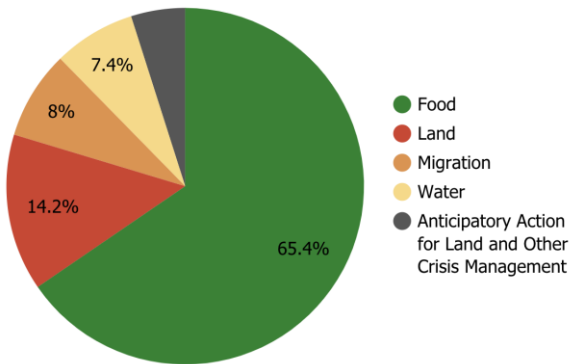
⁷ Tech Crunch (2023), "[Costanoa Ventures and Norrsken22 back Smile Identity in \\$20M Series B round](#)"

⁸ Punch NG (2022), "[Citibank extends N4bn loans to agric sector](#)"

Ford Foundation and Citi Bank Nigeria. Additionally, Public-International Organisation partnerships also support wider ecosystem initiatives, such as the Turkish Ministry of Foreign Affairs to work with the UN Development Programme to support impact-oriented innovators through the Sustainable Development Goals Impact Accelerator (SDGia)⁹.

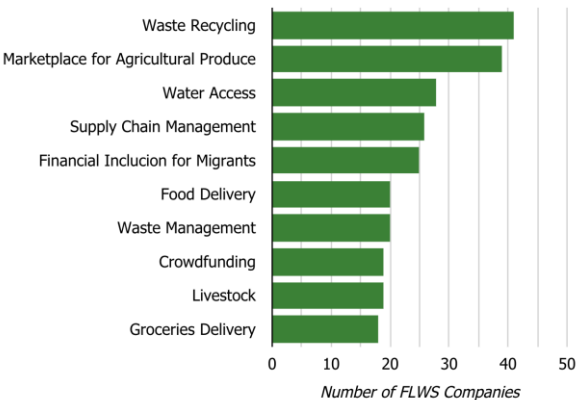
However, FLWS-HDP innovations are concentrated in food production. The mapping captures the following five innovation categories: 1) food production, 2) land management, 3) water resources, 4) migration, and 5) anticipatory action for natural land and other crisis management. Figure 5 shows that the largest category is food production, which makes up 70% of the FLWS-HDP innovators in the data, followed by land management and migrant innovations. Water resources and anticipatory action for natural land and other crisis management categories only make up less than 15% of all innovations. The most prevalent innovation does not always signal that they are the most impactful and private and public sectors need to collaborate to find the balance between developing solutions that are impactful and marketable.

Figure 5: FLWS-HDP innovators by innovation category



Source: Briter Intelligence Data (Q1 2015 - Q3 2023)

Figure 6: Innovation categories by the number of unique solutions



Source: Briter Intelligence Data (Q1 2015 - Q3 2023)

FLWS-HDP innovators offer a diverse set of solutions. Figure 6 shows that the data captures 92 different solutions among FLWS-HDP innovators. Each innovation category has solutions that stood out in terms of the number and type of innovations:

- Food production** has the most diverse solution offerings, with platform-based solutions such as digital marketplaces, food delivery, and crowdfunding being the most prevalent solutions, followed by supply chain management and agriculture inputs.
- Land management** innovators mainly offer solutions in waste recycling and waste management with some solutions in environmental protection, permaculture, and forestry management.
- Migrant** innovators are the most prevalent among digital solutions to connect migrants and displaced people with resources such as financial inclusion services, digital identity, know-your-customer (KYC), and

⁹ UNDP (2021), “[Five innovative start-ups win funding to fight poverty in Bangladesh and Uganda](#)”

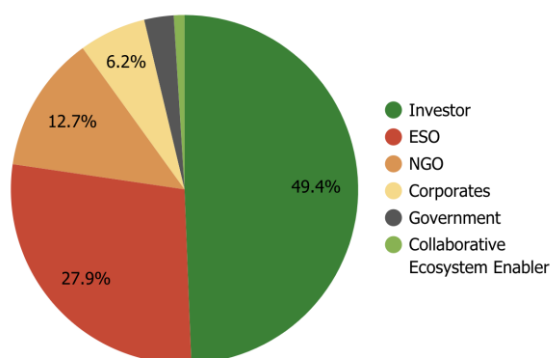
electronic medical records (EMR) solutions. Some hardware solutions for migrants focus on providing essential living spaces such as sustainable housing and solar energy solutions.

- Top **water resources** solutions were hardware innovators developing water pumps, sanitation stations, irrigation, and infrastructure builders whose aim is to increase water access.
- **Anticipatory action** innovators offered services aiding predictive and early response to crisis such as emergency services, crisis management support, data-based weather forecasting, and early warning systems.

2. C. Actors supporting the FLWS-HDP Innovation Ecosystem

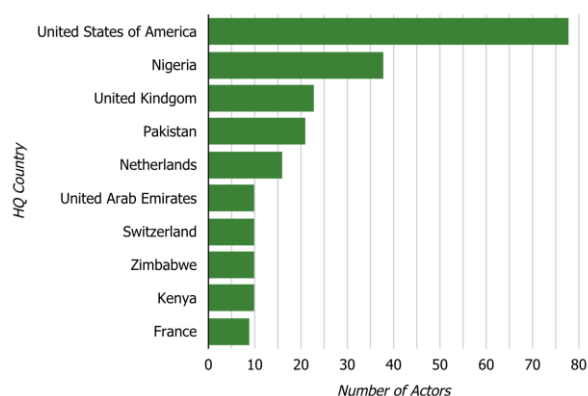
A range of actors identified in supporting early to late stage growth of FLWS-HDP innovators. Actors captured in the mapping support FLWS-HDP innovation ecosystems by providing funding ranging from awards and prizes to growth and late-stage financing. The research and data mapping captured over 400 actors that have a record of financially supporting FLWS-HDP innovators. These actors are categorised under the following six actor types: Investors, Ecosystem Support Organisations (ESOs), Non-governmental Organisations (NGOs), Governments, Corporates, and Collaborative Ecosystem Enablers.

Figure 7: Actors by Actor Types



Source: Briter Intelligence Data (Q1 2015 - Q3 2023)

Figure 8: Top 10 actor HQ countries



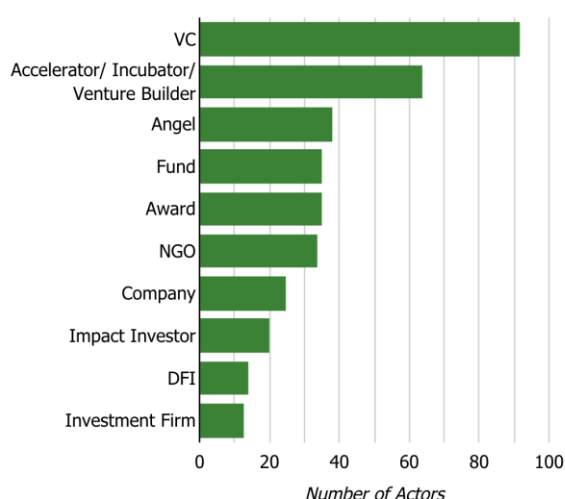
Source: Briter Intelligence Data (Q1 2015 - Q3 2023)

Actors from both the private and public sectors are involved in developing the FLWS-HDP innovation ecosystem, although there is room for further collaboration. All six types of actors fund and support FLWS-HDP innovators in FCAS countries. Figure 7 shows that nearly 90% of all actors are investors, ESOs or NGOs with nearly half of all actors investors. Corporates, governments and collaborative ecosystem enablers make up only about 10% of the actors. The diversity of actors is a reflection of the collaboration needed to enable and develop FLWS-HDP innovation ecosystems in the FCAS context. Collaborations among private investors, NGOs, and national and international governments can help bridge different efforts going into the FCAS and create longer-term economic resilience crucial to the HDP nexus.

Local actor participation is low and the gap is filled by foreign actors. Figure 8 shows that many of the top HQ countries of actors funding the FLWS-HDP innovation ecosystem are Global North countries such as the United States, United Kingdom, Netherlands, United Arab Emirates, and Switzerland. International actors are active across

all actor categories but they are particularly dominant among investor and NGO actor types. Figure 8 shows that Venture Capital (VC) investors are the most common type of investors active in FLWS-HDP ecosystems. This includes VCs from the United States such as Reflect Ventures and South Asia Tech Partners, as well as regional VCs from neighbouring countries such as Globinvest (Lebanon) and Global Ventures (United Arab Emirates). VCs from FCA countries are present in Nigeria and Pakistan, such as i2i Ventures (Pakistan) and Suya Ventures (Nigeria) but not as much in other countries. While foreign funding is crucial in the FCA context, there needs to be a balance between local and international sources of funding that builds a sustainable and localised support system benefitting both the funders and the beneficiaries of the funding.

Figure 9: Investor Type Breakdown



Source: Briter Intelligence Data (Q1 2015 - Q3 2023)

Commercial and impact-oriented investors are actively engaged while more institutional investors are rare.

Commercial investors, in particular VC and angel investors, are some of the top investors in the FLWS-HDP innovation ecosystem. Figure 9 shows that private foundations or DFIs as well as impact investors are also prevalent. However, financial institutions or other types of institutional investors that can provide debt are not as present. This is likely due to the challenges traditional financial institutions have with providing loans into these perceived risky markets. As the ecosystem and innovators develop and it becomes perceived as less risky, the investor landscape may change to show signs of maturity where more later-stage investors such as private equity (PE), debt providers, and commercial banks are also active.

NGOs and ESOs play an important role in early-stage innovation development. NGOs and ESOs are the main actors that host competitions, as well as incubator, and accelerator programmes. Many of these programmes are embedded in the local ecosystem even if they are funded by international partners. Many of the competitions are hosted through NGOs such as Heifer International, Small Foundation, and Elea Foundation. ESOs such as iceaddis (Ethiopia) and Goodlife x (Sri Lanka) provide a space for early-stage innovators to test their innovation to potential users, build sustainable business models, and connect to the resources that aid their growth. ESOs and NGOs can also serve as implementation partners for research organisations to provide innovation development support to connect early-stage innovations with entrepreneurial innovators.

National governments are engaging in early-stage innovator funding. National-level agriculture ministries can provide grants, such as Lagos State Science Research and Innovation Council, or work with DFIs to provide seed

funding to FLWS-HDP innovators, such as the Turkish Ministry of Foreign Affairs and United Nations Development Programme (UNDP) co-hosting SDGia, and the Swiss government and the Food and Agricultural Organisation (FAO) co-hosting an innovation award¹⁰. Government activities may be understated in the mapping as conflict and fragility impact the public sector capacity and their engagements may be outside the scope of this data. The country-level analysis in Chapter 4 shows that many national governments are involved in building FLWS-HDP infrastructure and supporting a suite of research institutes and policymaking arms. However, these activities are likely not sufficiently captured through funding information of private innovators. Nevertheless, engaging with national-level government is crucial in the FCAS setting, as co-building capacities with governments contribute to longer-term stability and to creating enabling environments for innovation.

Corporate actors collaborating with FLWS-HDP innovators can scale operations for both parties. Partnerships between corporates and early-stage innovators can create value for both parties when corporate actors contract FLWS-HDP innovators to utilise their solutions in their operations and/or offer the solutions on their larger distribution channels. For example, CityTap supplied their water metering IoT and water usage management software to the water company Veolia Africa to expand their reach in Niger. CityTap's payment system is also supported by the mobile network operator (MNO) Orange-Niger so that users can pay through mobile phone¹¹, eliminating the need for CityTap to spend time and resources in creating an in-house mobile payment solution. This type of collaboration and interoperability can help localised innovations to scale while creating an agile solution and new market opportunities for corporate actors. ESOs such as incubators, hubs, and research organisations are well-positioned to facilitate these collaborations and bridge the gap in the innovation adoption value chain.

Collaborative Ecosystem Enablers aggregate interest groups. Collaborative ecosystem enablers make up the smallest group of identified actors. The four actors captured in the mapping aggregate interest groups are farming organisations like East and Southern Africa Small Scale Farmers Forum (Tanzania) and União Nacional de Camponeses (Mozambique), and multi-stakeholder partnerships to produce research and conduct policy advocacy, such as Partnership for Inclusive Agricultural Transformation in Africa. This actor group will benefit from further research as this is where private-public-partnership initiatives as well as civil society groups and policy advocacy organisations can play an important role. The map of actors in the support ecosystem below demonstrates examples of the actors identified in the support ecosystem by their headquarters countries and by actor types.

¹⁰ FAO (2021), "[2021 Innovation Award winners announced](#)"

¹¹ Afrik21 (2019), "[Niger: CityTaps raises € 1 million and signs with Veolia Africa for prepaid water](#)"

2. D. Map of Actors in the Support Ecosystem

Actors in the Support Ecosystem



Investors



Government



NGOs



ESOs



Collaborative Ecosystem Enablers



Corporates



2 F. Key Findings

FLWS-HDP ecosystems are at vastly different stages of maturity, but some common attributes emerged. Analysis showed that the majority of innovators and funding was in three of the FCAS ecosystems Nigeria, Pakistan, Bangladesh, and Jordan. The rest only account for 30% of innovations and 21% of funding. However, across these ecosystems, some common patterns emerged:

- **Local FLWS-HDP innovators are addressing a key need in the market.** Market analysis identified more than 600+ startups operating across FLW-HDP ecosystems in FCAS. The case studies from the countries revealed they are addressing complex problems at the FLWS-HDP nexus ranging from improving the food value chain system to creating digital identity for migrants.
- **However, there is a concentration of funding in a few products in a few markets.** Review of the identified actors showed that a few products in a few key markets are driving the numbers. The majority of funding has gone to agriculture production companies and platforms that can connect agriculture products. Other products like water resource management, migrant housing and advanced weather forecasting have attracted much less funding.
- **Most FLWS-HDP ecosystems lack strong local public and private institutions.** The case studies revealed that the majority of FCA countries lack strong public and private institutions. Where they are strong, they are outside of the conflict-effect setting, such as in Lagos in Nigeria. The result is less involvement from these actors in supporting the FLWS-HDP ecosystems. Less than 10% of actors were local actors.
- **The majority of the FLWS-HDP ecosystem relies on foreign actors for support.** More than 90% of actors in the FLWS-HDP ecosystems are foreign-backed or funder investors, ESOs or NGOs. This includes more commercial actors like VCs and impact investors. Further, several strong local ESOs work with foreign funders to deliver acceleration and other support programmes.
- **A few key public-private partnership models are emerging.** The case studies revealed that there is a common public-private partnership emerging across the FCAS countries including:
 - Donor funded accelerator programmes with local hubs to promote new products and services
 - Co-funded startups by impact investors and DFIs
 - Direct funding to new types of products and services through grants and awards/prizes
- **There is limited evidence of direct involvement of research institutions.** Across the innovation ecosystems scientific research support was provided via NGOs or through donor-funded accelerator programs. This research found limited direct involvement of research institutions in innovation building, though these institutions have the potential to foster knowledge-sharing and skill-building.

Chapter 3. Assessment & recommendations

3. A. Exploring characteristics of FCA markets.

The solutions to increase access, productivity, and linkages in the FLWS-HDP innovation are growing. However, the FCA context presents unique challenges for how innovators deliver their solutions to the beneficiaries. These challenges also underscore the areas in need of support and support from other stakeholders, be it through more targeted investments, changes to the regulatory environment, access to networks, or capacity development and technical training. Some of the core challenges and opportunities present in the FCA context are listed in the table below organised under 5 key areas:

- 1) Access to services
- 2) Disruptions in the value chain
- 3) Stability and business security
- 4) Localising innovation
- 5) Sustaining innovations in the HDP nexus

Categories	Challenges	Opportunities
Area 1: Access to Services		
Access to infrastructure	Access to infrastructures such as financial services, solid roads, internet connection, and safe housing are not consistent nor guaranteed to ensure innovation development and effective supply chains.	<ul style="list-style-type: none"> ● Political and donor commitments are driving changes in macro-scale improvements shown by the \$11 billion in donor funding that went into the 14 FCAS countries¹² in 2020 alone. ● Corporate-innovator collaboration shows leveraging financial institutions and mobile network operators can improve access to infrastructural services. ● Incubator and accelerator programmes such as iceaddis have made their programme application process more accessible for rural populations without stable internet access and the existing understanding of the complexity of filling application forms online by accepting audio and video applications over messaging apps. Adjusting service offerings or the methods of distributing service can be more effective to reach harder-to-reach population with varied levels of access to infrastructure, digital literacy, and education.
Access to market	Innovators operating in the FCA context often has limited markets to expand to.	<ul style="list-style-type: none"> ● Innovators are expanding more vertically, building a suite of products and services, and in doing so, showcasing that expansion does not necessarily have to be through new users but existing users adopting more solutions. ● Working closely with producer networks, refugee groups, and local NGOs to help innovators reach potential customers more effectively.
Area 2: Disruptions in the Value Chain		
Food system disruptions	Fragility, conflict and migration disrupt the entire agri-food value chain and can impact food security outside regions directly affected by fragility and conflict.	<ul style="list-style-type: none"> ● Innovators pivot to find working value chains in regions less affected by conflict and fragility. ● Luther Lawoyin, CEO of PricePally, focused on sourcing from the South and Middle Belt region to work around the supply chain disruptions due to conflicts in North Nigeria.
Supply chains can change quickly	Conflicts and government fragility can lead to quick and sudden changes in the supply chains.	<ul style="list-style-type: none"> ● Early-stage financing can help innovators create a runway to test out their innovation and address gaps in the value chain ● Strengthening business sustainability in a few markets and regions can help innovators withstand value chain shocks

¹²UN OCHA (2022), "[Financial Tracking Services](#)"

Migration	Migration and displacement affect the value chain by creating gaps in human capital and increasing competition for resources.	<ul style="list-style-type: none"> ● Partnering with resettlement efforts can help innovators leverage and empower displaced people to re-enter the workforce ● Ekanikpong Ben, the Founder of El-Kanis and Partners shared his experience working with refugee farmers resettling in Southern Nigeria where he noticed that “refugee farmers were very dedicated to adopting all the best agronomic practices to rebuild their lives”.
Areas 3: Stability and Business Security		
Macroeconomic volatility	FCA markets are highly volatile and risky.	<ul style="list-style-type: none"> ● Blended and concessional financial instruments are helping to de-risk financial support in the FCAS markets. ● Innovators often create solutions that can respond to local challenges, with some adaptability to the context from the outset ● Examples include introducing hand-held and mobile farming equipment that needs smaller amounts of fuel and can be carried when people move, and providing portable solar-powered lamps and WASH stations.
Changes along the timeline	FLWS can change rapidly before, during, and after conflict and macro shocks.	<ul style="list-style-type: none"> ● Planning longer-term innovator support programmes help generate lasting interest in the ecosystem, strengthening innovators to find the right model for the solutions, and bringing more actors into the ecosystem. ● Private and public partnerships to support private innovations can help build longer-term monitoring and evaluation processes to standardise and track impact.
High cost in establishing business security	A volatile business environment means innovators need more support to build resilience.	<ul style="list-style-type: none"> ● A lot of early-stage support is grant-based to help secure some cash flow for innovators. ● Most early-stage supporters provide research, business advisory, and networking support.
Area 4: Localising Innovation		
Packaging for use cases	Technologies already exist but there is a gap in linking and transforming those technologies for specific use cases.	<ul style="list-style-type: none"> ● Engaging with local implementers can help create and maintain a feedback loop on how beneficiaries interact with innovations. ● Markos Lemma, the co-founder and CEO of iceaddis, remarked that taking the time and effort to understand the needs and the perspectives of smallholder farmers usually yields better results as it helps innovators package the innovation to suit the smallholder farmers’ needs. ● Innovators often adjust their solutions according to the challenges and changing needs of the beneficiaries. ● Danny Cutherell, the Regional Director for the Refugee Investment Network gives an example of a case where an existing technology needed to be adapted to work for the

		<p>refugee population. “Until very recently¹³, most refugees in Kenya could not fulfil Know Your Customer (KYC) requirements to set up a bank account or mobile money account, which led to WFP Kenya introducing a new mobile money targeted for refugees to spend at specific stores to increase refugee market access.”</p> <ul style="list-style-type: none"> ● Research organisations can play a key supporting role in advising and testing innovations to fit local markets.
Adjusting the scope of scaling	The ability to scale appears limited in the FCA context.	<ul style="list-style-type: none"> ● ESO support for innovators centered around aligning the value proposition and impact, helps adjust the way innovators and funders assess scaling in the FCAS context. ● Collaboration between private and public sector stakeholders can facilitate access to new and existing distribution channels. ● Commercial and concessional investors often work together to de-risk supporting FLWS-HDP innovations
Knowing the beneficiaries	End-beneficiaries in the FCAS context are disaggregated and hard-to-reach	<ul style="list-style-type: none"> ● Data-driven solutions help capture more accurate beneficiary information, such as digital identity platforms and digital voucher systems for food assistance ● Building sustained relationships with local actors can help reach more hard-to-reach beneficiaries.
Area 5: Sustaining Innovations in the HDP nexus		
Gap in HDP nexus	Gaps between humanitarian and development efforts still exist.	<ul style="list-style-type: none"> ● Private-sector innovation can play a big role in building local markets. ● Local organisations are getting involved at the implementation level to create a more lasting impact on the ground.
Different timelines of HDP interventions	Humanitarian interventions are often short term and the opportunity to scale can halt when the humanitarian intervention stops.	<ul style="list-style-type: none"> ● Innovation is used as a tool for efficient service delivery when certain events trigger humanitarian sector mobilisation. ● Rana Nassar, the Middle East and North Africa Regional Representative at CALP Network said that innovations are “more about increasing the efficiency of the existing cash and voucher assistance in humanitarian settings after certain crises and corresponding funding triggers a scaling effort. For example, the Syrian refugee crisis in Jordan was a trigger to bring in these innovations.” ● Initiatives such as WFP’s Building Blocks are designed with collaboration in mind, allowing collaboration between humanitarian agencies. ● Increasing interoperability between stakeholders will support the longevity and sustainability of innovations and initiatives.

¹³The Star (2023), “[Kindiki gazettes refugees' documents to enable them get jobs in Kenya](#)”

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- Innovation development and funding interest in innovations reveal that bottom-up economic activities to build resilient economic systems exist in FCAS countries.
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3. B. Recommendations for strengthening the FLWS-HDP innovation ecosystem

This section draws from chapters 1 and 2 to provide recommendations on how CGIAR can support the private sector innovation as a way to develop resilient FLWS-HDP innovation ecosystems in FCAS. This section is divided into three sections (1) Key considerations for supporting the private sector innovations at large, which provides ecosystem-level recommendations and; (2) key considerations for supporting the private sector innovations as a research organisation, which lays out the key roles and considerations for CGIAR or similar research organisations in developing and fostering the innovation ecosystems in FCAS, and (3), exploring the potential synergies from partnerships.

(1) Key considerations for supporting the private sector innovations at large:

Context matters. Private sector engagement strategies should be designed in a way that considers and is reflective of the FCAS. While all the countries in the study are impacted by fragility, conflict and migration to some extent, the way these conditions manifest in the broader socioeconomic environment differs significantly. Abdoulaye Ndiaye, the Senior Policy Associate at J-PAL with previous experience working on social protection and safety nets at WFP mentioned that “When it comes to working with fragility and conflict-affected settings, solutions cannot be ‘copy and pasted’ but they need to be highly localised for the users and the beneficiaries of the technologies”. According to WFP the success of an acceleration programme will depend heavily on the context in which the ventures operate. Some companies may not have a viable market to scale, many will face legal and administrative challenges, and most will have to account for FOREX risks.

The value proposition should be anchored to the impact on the beneficiaries. Efforts to scale FLWS-HDP innovations should stay focused on identifying the companies that can really solve the bottlenecks and pain points of the population impacted by fragility and migration. Solutions need to work as a standalone product (i.e., solar lamps) or need to solve what the existing condition cannot solve (a new mobile money product for refugees who cannot get M-PESA due to not meeting KYC requirements). Danny Cutherell, the Africa Director at Refugee Investment Network stresses that “it is important to remember that when introducing innovations to refugees, the problem the innovation is trying to solve is not a technology problem but a human problem. This means that the focus should be about making the right connection between refugees and essential and enabling services.” However, developing impact-based value propositions through private sector innovators will often require financial partnerships from support organisations and donors as purchasing power is lower among beneficiaries affected by fragility and conflict. Examples of Rahat.io and OGOW HEALTH show that innovators serving low-income or no-income beneficiaries mostly take on B2G or B2NGO models where the paying customers (government and humanitarian organisations) subsidise or distribute the solutions to the end beneficiaries.

Leverage private innovators as the catalysts for longer-term systemic change that can bridge the gap between humanitarian/donor-driven funding and private innovators. The data shows that private sector innovators actively develop and deploy FLWS-HDPS solutions. Innovators go through iterative processes to adapt the solutions to match the needs of the end beneficiaries and find sustainable business models to build out their operations. Moreover, the investment and actor data reveal that other private sector actors are engaged across the innovation value chain. They incubate and provide seed funding for early-stage innovators, they provide working capital to scale innovations, they sometimes become customers of the innovators, and few even acquire innovators to incorporate the solutions into their suite of offerings. Supporting and leveraging private sector innovators and actors can contribute to building more sustainable systemic change where innovators and value chain actors are sustainable and resilient against the shocks derived from FCAS challenges.

Prioritise local actors. Local stakeholders are an important link between temporary humanitarian efforts and longer-term development. As the ecosystem develops, there needs to be less reliance on international funders that may not be present in the ecosystem long-term and more efforts to activate local actors committed to longer-term development. Randhula De Silva from Good Life X stresses that “finding competent partners on the ground equipped with the country- and innovation-level context to really implement the programme and develop an ecosystem” is one of the key ingredients for building resilience into accelerator programming in the FCAS context.

(2) Key considerations for supporting private sector innovations as a research organisation

Be an active linkage in the science-2-business value chain. There is a complex value chain for scientific innovation to be adopted and deployed through private sector innovators. This value chain needs to be mapped out at the innovation or solution level and be connected with the right partnerships. CGIAR's research and internal innovations have proven the potential to increase resilience among FLWS-HDP actors in FCAS; however, innovations do not scale organically and require a strategy and incentives for uptake by the private sector.

Provide science-4-business support through scientists in residence or expert-as-a-service to bridge the gaps between scientific innovation and business adoption. Many FLWS-HDP innovators are still in the early stages and can benefit significantly from research and innovation development support. According to the WFP Innovation Accelerator, "Early-stage companies are often stuck at researching the right business models and innovations/technology either due to the lack of expertise or the resources to access experts and hence need more research support." Knowledge sharing and technical expertise can be a big value-add for innovators developing more scientifically-based models of the FLWS-HDP ecosystem.

Boost context-specific solutions. If the solutions are not yet context-specific, help those solutions to localise the technology and innovation to ensure the end users can access and use them. Ekanikpong Ben from El-Kanis & Partners stressed the need to have context-specific products. The company once developed an agro-advisory and market access app that turned out to be unsuccessful because people needed internet access to use the app. Instead, they tweaked the solution to work on non-smart phones and incorporated local languages and dialects to disseminate agro-advisory and weather advisory information. The same design principle can be applied to hardware solutions. Ekanikpong Ben pointed out that "mobile dryers and hand-held equipments that only require a few litres of fuel would be better suited to help reduce post-harvest loss in the FCAS context than stationary machinery."

Build resilience in the programme by having a longer term programme design. Randhula from Good Life X pointed out that "new models of collaboration take time to prove their profitability and success cases to the market". She observed that resilience should be integrated in the scaling programme by planning "at least five years to have the impact they are trying to achieve". This is in line with the consultation with work package 3 - "Stabilise" who revealed the difficulty in identifying the impact of a programme as many have started recently and the monitoring and evaluation process takes a longer time. Developing a longer-term programme that plans in the time for behaviour change and monitoring and evaluation process encourages support organisations to assess where support organisations need to build in resilience from the beginning.

Have clear ethical considerations. There needs to be early alignment between researchers, humanitarian groups, and businesses on how to prioritise the impact on the beneficiaries. Abdoulaye Ndiaye from J-PAL shared that "it is crucial that research organisations translate the researcher language to humanitarian interventions at the beginning to ensure that both partners ground their expectations to a shared aim and the intervention methodology reflects the needs of the beneficiaries." Randhula de Silva, the CEO and Founder of Good Life X also mentioned that "when working in the FCM context, the programme communication needs to be careful and considerate. Conflict-affected spaces are very sensitive about being associated with conflict so the language used throughout the programme should be more neutral, universal, and empowering". On support measures that work with capacity enhancement, it is important to move away from welfare-related languages such as "give help" and use languages associated with an entrepreneurial mindset such as "empowering", "capacity sharing", "equipping" and "programming to create equal economic opportunities for the population".

Delve deeper into the data. An opportunity for further research that can aid support for private sector innovation is to further develop the database of innovators and surrounding actors to assess the direct impact of solutions for the FCA context. Collecting data on innovators' operations at the city and regional level and consistently measuring the impact of solutions on target beneficiaries would be two main ways future data explorations can help make more informed decisions on how and where research organisations provide support.

(3) Synergies from Partnership

Leverage established partners as distribution partners. Businesses that can create infrastructural linkages are useful partners, such as Mobile Network Operators, financial institutions, and agribusinesses. Member organisations in the CALP network often partner with financial service providers in the country, who can also be members of the CALP network, through contracting or joint tenders to efficiently provide cash and voucher assistance programmes. Graine is a Burkinabé microfinance institution that provides microcredit for entrepreneurs that targets impoverished populations and women, helping both businesses and beneficiaries build credit.

Partner with local implementation partners that are there to stay. While larger international organisations are an important source of knowledge, funding, and capital, it is crucial to involve local implementation partners that have a better understanding of the end users, how to reach a hard-to-reach population, and to create a link between humanitarian interventions and a longer-term development strategy. Abdoulaye from J-PAL mentioned that “There can be a selection bias where large organisations only choose to work with other larger organisations. Choosing to work with larger partners may be a good choice when aiming to scale. But when innovations are being first introduced, smaller implementation partners may be more effective partners.” The WFP Innovation Accelerator programme increases market access of innovators by linking them with local distribution channels through networks such as the Farm to Market Alliance (FtMA).

Partnerships should help reduce risks for businesses. From a country level, there are many benefits of stimulating local innovation, even if they're not yet operational in specific communities affected by conflict. Private sector innovators need an enabling environment to develop their business models to be viable and commercial and attract funds and support from risk-averse investors.

Find the “nodes” that can disseminate information. Sandra Ruckstuhl, the Lead of Work Package 1 - “Anticipate” stressed “the need to empower the right influencers to promote stability and peacebuilding.” Similarly, Abdoulaye from J-PAL mentioned that “An important consideration when finding the right partners is to identify the node in the ecosystem that can effectively disseminate the information and innovation. The process of finding this node can be challenging but will help scale the intervention.”

The government needs to be a friendly partner. Aim to develop a partnership focused on capacity sharing and development. Consultation with Work Package 4 - Accelerate emphasised the importance of involving the private sector as “it is impossible for the private sector to register and operate without the government's permission. The government still functions as an enabling body even in fragile states where the government is very weak. And governments can also be a major barrier in building private capital so it is very important to align with governments.”

Chapter 4. Country Overview

The Country Overview section explores each of the 14 countries across the three regions in terms of the macroeconomic context, the FCA setting, the FLWS and HDP innovation ecosystem, and case studies highlighting innovators with demonstrated impact and programmes by key actors.

Burkina Faso | Sub-Saharan Africa

Macroeconomic Context

Burkina Faso is a landlocked country in West Africa and home to 22.7 million people, 73% of whom are employed in the agriculture sector.¹⁴ Burkina Faso is a low-income country with a GDP per Capita of USD 2,546 in 2022.¹⁵ A Human Development Index Score of 0.449 indicates that there is significant room to improve people's standard of living and access to education and healthcare. The Burkina Faso Doing Business score is at 51.4, placing Burkina Faso at the lower end when compared globally. In 2022, Burkina Faso received USD 406 million in donor funding, which is about 2.2% of the country's total GDP that year. The World Bank classifies Burkina Faso as a conflict-affected country as the violent attacks by Islamist armed groups continue to cause civilian and military deaths and internal displacements across the country.

Burkina Faso || Macroeconomic Country Overview

	Population	Human Development Index (HDI)	Doing Business Score	Donor Funding	World Bank List of FCAS
Figure	23M	0.45	51	\$406M	Conflict-Affected Country
Source	World Bank (2022)	UNDP (2021)	World Bank Doing Business Score (2020)	UN OCHA Financial Tracking Services (2022)	World Bank, FY24 FCAS List

FCA Context

The top FCA conditions are forced internal displacements, increased insecurity and civilian casualties caused by an Islamist insurgency that is linked with Al-Qaeda and IS.¹⁶ The insurgency has been spreading from Burkina's northern Sahel region, in particular in the Soum province, to other parts of the country since 2015 and caused close to 2 million internally displaced people in 2022.¹⁷ The Burkinabè agricultural economy is characterised by subsistence farming activities, low crop and livestock productivity, and an informal value chain.¹⁸ The security risks have exacerbated the already high competition for natural resources in the northern regions of Burkina Faso as forcibly displaced persons and their livestock compete more with the existing population for land, water, and other natural resources. Increased competition and the lack of access to markets have left over 800,000 citizens in cities under blockade without basic resources and food, and up to 3 million Burkinabè were expected to experience hunger by Q3 2023.

Burkina Faso || Key Fragility, Conflict, and Migration Relevant Figures

Governance Index	Global Hunger Index Score	Global Food Security Index Score	Agri as % of GDP	Arable Land	Water Stress	Population with a financial institution account	Internally displaced people
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¹⁴ World Bank (2021), "[Employment in agriculture \(% of total employment\) \(modeled ILO estimate\) - Burkina Faso](#)"

¹⁵ World Bank (2022), "[GDP per capita, PPP \(current international \\$\)](#)"

¹⁶ Human Rights Watch (2023), "[Burkina Faso: Upsurge in Atrocities by Islamist Armed Groups](#)"

¹⁷ IDMC (2022), "[Burkina Faso](#)"

¹⁸ World Bank (2017), "[Burkina Faso: Agriculture as a Powerful Instrument for Poverty Reduction](#)"

Note	1: lowest, 10: highest	<10: low alarming, 50+: extremely alarming	0: lowest, 100: highest, ranking out of 113 countries	Agri, fisheries, and forestry value-added	% of the total land	% withdrawn from total renewable source	% of population, age 15+	Number at the end of the year
Figure	5.2	25	50 (89th)	18%	22%	8%	No Information	1.9M
Source	BTI Transformation Index - Governance (2022)	Global Hunger Index (2022)	Economist Impact, Food Security Index	World Bank *1990 is the most recent data	FAO (2021)	FAO Aquastat (2020)	World Bank Global Findex Database (2021)	Internal Displacement Monitoring Centre (2022)

FLWS Innovation ecosystem in the HDP nexus

The FLWS-HDP Innovation ecosystem in Burkina Faso is relatively small compared to other FCAS countries. This study identified just over 20 technology and digital-based innovators in the ecosystem, most of whom offer solutions in the food production category. The food innovation companies are active in providing food processing services and fertiliser and input products. WASH innovations are the most prevalent in the water management category and are represented by companies such as Palobdé and IRC Wash. There is a sign of other land management innovations burgeoning in the Burkinabè ecosystem such as Cargitech, a solution that provides cartography imagery service through aerial drones, and TECO², building affordable housing leveraging materials made of recycled resources.

Ongoing conflict or an unstable political situation makes it quite high-risk for investors. Investments in the Burkinabè FLWS-HDP innovation ecosystem mostly go into early-stage innovators. Of the 6 deals identified in the data, half of them were seed or incubator/accelerator stage funding with less than \$100K ticket size. One exception is the social-impact agro-processing company Agroserv, which raised \$6.6 M equity investment from social-impact investors Oikocredit and Investisseurs & Partenaires (I&P) and \$6.4M debt from BIO and EDFI AfriFi in 2022.¹⁹ This fundraising round also saw the successful exit of Sinergi Capital which previously invested in Agroserv in 2017. Agroserv's funding rounds demonstrated that funding partners can invest in high-impact innovations in the FLWS-HDP. Nevertheless, the ecosystem as a whole is still nascent and the success case should be translated to benefit the broader ecosystem.

¹⁹ Bio Invest (2022), [“Oikocredit and Investisseurs & Partenaires, with support from lenders BIO Invest and EDFI AfriFi, invest EUR 12.2 M in Agroserv”](#)

Box 1: INNOVATOR SPOTLIGHT - [YOLSÉ](#)

Background

Yolsé supports agricultural producers through access to quality inputs, digital financing solutions, agricultural insurance, tailor-made technical support, and secure market access.

Business model

The company is targeting groups of 50-75 producers at a time to facilitate their work. There is a dedicated mobile app for accessing several of the tools, and Yolsé partners with specialist organisations to deliver services such as insurance.

Impact

The company aims to increase agriculture's contribution to Burkina Faso's GDP, helping producers produce more and sell at better prices. By offering tools to address some of the biggest gaps that exist, Yolsé tries to be the link between agricultural stakeholders.

Scale and reach

Through the tools offered, Yolsé estimates that they have supported more than 2000 producers, increased agricultural yields by 46%, and supported a rise in agricultural income by 52% on average.

Box 2: ACTOR SPOTLIGHT - [GRAINE](#)

Background

Graine is a microfinance institution dedicated to improving the economic and social conditions of impoverished populations in Burkina Faso, targeting primarily women. The organisation provides access to microcredit for entrepreneurial purposes.

Impact

Graine is supporting vulnerable populations in the country by providing financial services to people who would otherwise have difficulties accessing traditional financial institutions. This is particularly important in the agricultural sector, where a large segment still lives below the poverty line and does not have a formal bank account.

Scale and Reach

The organisation has had nearly 20,000 beneficiaries, with more than 83% being female, and 78% rural.

Eritrea | Sub-Saharan Africa

Macroeconomic Context

Eritrea is an East African country in the Horn of Africa bordering the Red Sea in the East, Ethiopia in the South, and Djibouti in the Southwest. Eritrea's population is small at 3.7 million people and is a reclusive country with little

macroeconomic data revealed in recent years. Eritrea's last known GDP per capita is from 2011 and it places Eritrea as and is a low-income country with a GDP per capita last revealed as \$1,629 in 2011.²⁰ Eritrea's low Human Development Index score of 21.6 indicates a very low life expectancy, education level, and standard of living and the low doing business score eludes low levels of private sector development. While Eritrea received relatively large quantities of aid in the past, Eritrea began rejecting foreign assistance around 2005 with the government's strive towards self-reliance²¹. Eritrea has maintained a one-party government system since its independence from Ethiopia in 1993 and bans any other political parties or activities. The government's strict oppression against political activism has led to continued violation of human rights²² and the World Bank classifies Eritrea as a fragility-affected state.

Eritrea || Macroeconomic Country Overview

	Population	Human Development Index (HDI)	Doing Business Score	Donor Funding	World Bank List of FCAS
Figure	3.7M	0.49	21.6	\$8.9M	Fragility-affected country
Source	World Bank (2022)	UNDP (2021)	World Bank Doing Business Score (2020)	UN OCHA Financial Tracking Services (2022)	World Bank, FY24 FCAS List

FCA Context

Eritrea's tight political and economic controls are resulting in forced migration out of the country to avoid compulsory military conscription,²³ as well as high levels of poverty and food insecurity.²⁴ The large flight of Eritreans outside the country, including over 30,000 Eritreans that arrived in Europe in 2015 alone, puts a constraint on the labour force.²⁵ The majority of migrants and asylum seekers being young men below the age of 40²⁶ signals that the food, land, and water systems will need innovations that can replace the significant portion of its productive labour force missing on rural and subsistence farms. Eritrea's weak food security is often attributed to both environmental and developmental reasons. Erratic rainfalls limit consistent food production with room for better water resource management and small-scale irrigation systems. In addition, low access to farming technologies, technical skills, quality inputs, institutional capacity, and high reliance on imports are developmental factors affecting the food security of Eritreans.²⁷

Eritrea || Key Fragility, Conflict, and Migration Relevant Figures

Governance Index	Global Hunger Index Score	Global Food Security Index Score	Agri as % of GDP	Arable Land	Water Stress	Population with a financial	Internally displace people
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²⁰ World Bank (2022), "[GDP per capita, PPP \(current international \\$\)](#)"

²¹ LA Times (2007), "[Eritrea aspires to be self-reliant, rejecting foreign aid](#)"

²² United Nations Human Rights (2023), "[Human Rights Council Hears that the Human Rights Situation in Eritrea Remains Dire and Shows No Sign of Improvement, and that the Situation of Human Rights in Afghanistan Continues to Deteriorate](#)"

²³ CSIS (2018), "[What Peace in Eritrea Means for Forced Migration](#)"

²⁴ FAO (2011), "[Price Monitoring and Analysis Country Brief](#)"

²⁵ CSIS (2018), "[What Peace in Eritrea Means for Forced Migration](#)"

²⁶ GSDRC (2016), "[Rapid fragility and migration assessment for Eritrea \(Rapid Literature Review\)](#)"

²⁷ IFAD (2023), "[Eritrea](#)"

institution account								
Note	1: lowest, 10: highest	<10: low alarming, 50+: extremely alarming	0: lowest, 100: highest, ranking out of 113 countries	Agri, fisheries, and forestry value-added	% of the total land	% withdrawn from total renewable source	% of population, age 15+	Number at the end of the year
Figure	No information	No information	No information	24%	0.057%	No information	No information	No information
Source	BTI Transformation Index - Governance (2022)	Global Hunger Index (2022)	Economist Impact, Food Security Index	IFAD (2023)	FAO (2021)	FAO Aquastat (2020)	World Bank Global Findex Database (2021)	Internal Displacement Monitoring Centre (2022)

FLWS Innovation ecosystem in the HDP Nexus

Eritrea's reclusivity is reflected in its limited macroeconomic information and the lack of data on the innovation ecosystem. The standard data collection methodology did not capture any FLWS-HDP innovations or records of funding in the Eritrean ecosystem. Even looking outside of the FLWS-HDP products, the only digitally enabled and tech-focused innovator with publicly available information was a social application that is mainly used by the Eritrean diaspora. The lack of data does not imply the complete absence of Eritrean innovators but reflects the limitations for innovators and investors face in Eritrea's tightly controlled economy. The low internet usage,²⁸ the absence of mobile money services.²⁹ the high rate of migration and the debt crisis contribute to the challenging business environment for FLWS-HDP innovations to operate and scale in Eritrea.

While the private sector innovation in the FLWS-HDP ecosystem is less known, the Eritrean government and multilateral organisations play a more visible role in the innovation development. The Eritrean government is also investing in building dams such as the Msilam Dam and Adi Halo Dam with the aim of providing better water access to agriculture and livestock actors.³⁰ The government has also been collaborating with international actors to strengthen the climate resilience of the food system. The Ministry of Agriculture has partnered with FAO Eritrea to run an assessment of the Agricultural Innovation System in Eritrea with a longer-term aim to strategise ways to scale agricultural innovations.³¹ The CSARIDE project is a multistakeholder collaboration among the Eritrean government, agricultural universities, and international research organisations, including CGIAR's ILRI, to promote market-led innovation in the Eritrean dairy value chain.³²

Ethiopia | Sub-Saharan Africa

Macroeconomic Context

Ethiopia is located in the Horn of Africa, landlocked and bordering Eritrea, Djibouti, Somalia, Kenya, Sudan, and South Sudan. Ethiopia's 123 million population makes it the second most populous African country after Nigeria. Ethiopia is a low-income country with a GDP per Capita of \$2,811 in 2022.³³ Ethiopia's Human Development Index

²⁸ ITU estimates that 22% of the Eritrean population use the internet, though this estimate differ in other sources.

²⁹ Making Finance Work for Africa (2019), "[Eritrea: Financial Sector Overview](#)"

³⁰ Farmer's Weekly (2023), "[Project Management & Governance](#)"

³¹ FAO (2021), "[National Agricultural Innovation System Assessment in Eritrea](#)"

³² CSARIDE (2023), "[Project Management & Governance](#)"

³³ World Bank (2022), "[GDP per capita, PPP \(current international \\$\)](#)"

score of 0.498 indicates room for improvement in the quality of life, education outlook, and healthy lives. The Doing Business score under 50 suggests that Ethiopia’s regulatory performance for businesses is very low and is lower than the Sub-Saharan Africa (SSA) average of 51.8.³⁴ In 2022, USD 2.3 Billion in donor funding went into Ethiopia, amounting to 1.8% of Ethiopia’s GDP. The World Bank classifies Ethiopia as a conflict-affected state as the ethno-regional conflict in the Tigray region continues to result in violence and internal displacement.

Ethiopia | | Macroeconomic Country Overview

	Population	Human Development Index (HDI)	Doing Business Score	Donor Funding	World Bank List of FCAS
Figure	123M	0.50	48	\$2.3B	Conflict-affected country
Source	World Bank (2022)	UNDP (2021)	World Bank Doing business score (2020)	UN OCHA Financial Tracking Services (2022)	World Bank, FY24 FCAS List

FCA Context

The most concerning FCA condition in Ethiopia is its large internally displaced population. There are 3.1 million internally displaced persons as of 2023³⁵ who are living in drought-affected areas and in need of humanitarian support. In addition, the strain on resources is high among its existing refugee population. Ethiopia is one of the largest refugee host countries in Africa, hosting over 900,000 refugees and asylum seekers from South Sudan, Somalia, and Eritrea.³⁶ Many refugees are hosted by Ethiopian families or they reside in overcrowded shelters or live outside. Lastly, regional geopolitical instability is a looming factor for Ethiopia. The Tigray war involved the participation of the Eritrean military and shook Ethiopia’s diplomatic position as the host of the African Union’s headquarters.³⁷

The Tigray war primarily affects the northernmost region of Tigray but has expanded across Afar, Oromiya and Amhara regions.³⁸ Since 2020, the Tigray war has killed thousands of Ethiopians and displaced millions of people to flee from ethnic violence. During the Tigray war, Sudan and Ethiopia also began to have a border dispute surrounding a fertile area in the Tigray region. In addition, the controversy surrounding the development of the Grand Ethiopian Renaissance Dam has created diplomatic feuds among Egypt, Sudan and Ethiopia³⁹. While the diplomatic controversy hasn’t led to any military action, the issues surrounding water supply and land that can access water are and will increasingly become an important decider for peace in Ethiopia considering that Sudan and Ethiopia currently have a border dispute over fertile land in the Tigray region.

The Tigrays, Oromia, and Amhara regions are some of Ethiopia’s key regions for agriculture⁴⁰ and hold a large proportion of the farming population. The Tigray region has been experiencing famine since the war in 2020 and 80% of farming households report that their farming practices and land have been affected by the war.⁴¹ In addition,

³⁴ World Bank Doing Business (2020), [“Doing Business 2020 Fact Sheet: Sub-Saharan Africa”](#)

³⁵ UNHCR (2023), [“Ethiopia Humanitarian Crisis”](#)

³⁶ UNHCR (2023), [“Ethiopia Humanitarian Crisis”](#)

³⁷ Council on Foreign Relations (2023), [“Conflict in Ethiopia”](#)

³⁸ Council on Foreign Relations (2023), [“Conflict in Ethiopia”](#)

³⁹ Brookings (2020), [“The controversy over the Grand Ethiopian Renaissance Dam”](#)

⁴⁰ Deepak Pareek (2023), [“What drives innovation and development in agriculture?”](#)

⁴¹ World Peace Foundation (2022), [“Tigray’s Wounded Agriculture and a Second Year of Famine: An Urgent Call for Action”](#)

many eligible labour forces have been displaced from agricultural regions to drought-prone regions and may undermine the regions' recovery from war-led food crises.

Ethiopia || Key Fragility, Conflict, and Migration Relevant Figures

	Governance Indicator	Global Hunger Index Score	Global Food Security Index Score	Agri as % of GDP	Arable Land	Water Stress	Population with a financial institution account	Internally displace people
Note	Avg of all indicators - 2.5: lowest, +25: highest	<10: low alarming, 50+: extremely alarming	0: lowest, 100: highest, ranking out of 113 countries	Agri, fisheries, and forestry value added	% of total land	% withdrawn from total renewable source	% of population, age 15+	Number at the end of the year
Figure	-0.95	No information	45 (100th)	38%	14%	32%	35%	4.6M
Source	World Bank WorldWide Governance Indicator (2021)	Global Hunger Index (2022)	Economist Impact, Food Security Index	World Bank (2022)	FAO 2021	FAO Aquastat (2020)	World Bank Global Findex Database 2021	Internal Displacement Monitoring Centre (2022)

FLWS Innovation ecosystem in the HDP nexus

Ethiopia has a relatively more active FLWS-HDP innovation ecosystem compared to other FCA countries covered in this study. More than 50 FLWS-HDP innovators are identified in the data, with the food production category being the most active. Among food production innovators, the most prevalent product types were platforms connecting value chain actors such as marketplaces for agricultural inputs and products. Hardware innovations, such as farm equipment, WASH facilities, and irrigation kits are also top innovation offerings in Ethiopia, signalling that the ecosystem also has production capabilities for hardware as well as digital innovations.

Across the 50+ innovators found, 13 deals were identified. The overall funding landscape shows that the ecosystem is still at an earlier stage as over half of those deals were from Pitch AgriHack Challenge or Y-combinator accelerator. EthioChicken, which breeds disease-resistant chickens and feed for smallholder farmers in Ethiopia raised over USD 14 million from investors such as Finnfund, Flow Equity and Acumen. Ethiochicken is a commercially-driven model that provides one-day-chicken at a lower cost but there has not been a thorough assessment of their impact on smallholder farmers or people experiencing FCA-related shocks. However, the case of Ethiochicken is more of an outlier in the ecosystem when compared to other innovators that are still at the early stage.

Box 1: INNOVATOR SPOTLIGHT - [Clara](#)

Background

Clara is improving access to safe drinking water for rural Ethiopian communities by installing chlorinating stations that continuously disinfect water using kitchen salt and electricity. The chlorination station is powered through solar panels and is connected to the internet to provide real-time status updates.

Business model

Clara sells the hardware machine to both private and public partners. They offer additional services such as maintenance. Clara can function as a standalone product as long as the energy source for electricity is sustainable as well. The remote-sensing capabilities can make its maintenance system more efficient.

Impact

Clara's 3 water stations have provided clean water access to 11,400 people in Ethiopia. This has lowered the presence of E. coli in households that use Clara water. Clara has also provided two of the stations to hospitals.

Scale and reach

Clara-standard water station can treat up to 96m³ of water daily for up to 4800 people. They have received a [grant from the EU](#) to test the tool in different African regions. After the testing period, Clara went through the incubator programme at iceaddis - Aqua for All and an accelerator programme through the Swiss Innovation Agency.

Box 2: HUB HIGHLIGHT- [iceaddis](#)

Background

Since 2011, iceaddis has been a one-stop-shop hub supporting early-stage businesses and startups in Ethiopia. They provide incubator and accelerator programmes for tech-oriented companies and also hold ecosystem events like hackathons, competitions, and network events. While iceaddis is sector-agnostic, they have partnered with FLWS-HDP actors such as Aqua For All to build an incubation programme for companies with innovative WASH solutions.

Impact

Iceaddis has supported 76 startups and over 160 entrepreneurs through its incubation and accelerator programmes. iceaddis has hosted over 300 competitions and events between 2011 and 2022. iceaddis also partners with international innovation networks to increase visibility of the Ethiopian innovation ecosystem.

Scale and Reach

Iceaddis has launched consultancy services and also expanding regionally to increase the capacity of entrepreneurial support organisations in Ethiopia. They also expanded their services beyond Ethiopia into South Sudan, South Africa, and Somalia. Iceaddis is utilising their experience and market know-how to help set up innovation hubs in universities and partner organisations.

Mali | Sub-Saharan Africa

Macroeconomic Context

Mali is a vast Sahelian West African country that is landlocked among neighbours Algeria, Mauritania, Niger, Burkina Faso, Côte d'Ivoire, Guinea, and Senegal. Mali's population is 22 million and 68% of the total working population is employed in the agriculture sector.⁴² Mali is one of the largest African countries in terms of its land size but the majority of its land is in the Southern Sahara region. Although Mali has considerable natural resources such as gold, uranium, and phosphates, Mali is a low-income country with a GDP per capita of USD\$2,517 in 2022.⁴³ The Human Development Index score of 0.428 for Mali places Mali as one of the lowest-scored countries in the world. Mali's Doing Business score is at 52.9 and 148th in the world, which is slightly similar to its neighbours (Burkina Faso - 151st, Mauritania - 152nd out of 190 countries) and even other countries with relatively low levels of conflict such as Tanzania (141st). In 2022, Mali received USD 386M in donor funding, which amounts to 2% of Mali's GDP that year. The World Bank classifies Mali as a conflict-affected state due to its continued instability and conflict from the 2012 military coup and the armed groups in the north.⁴⁴

Mali || Macroeconomic Country Overview

Population	Human Development Index (HDI)	Doing Business Score	Donor Funding	World Bank List of FCAS
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⁴² World Bank (2021), "[Employment in agriculture \(% of total employment\) \(modeled ILO estimate\) - Mali](#)"

⁴³ World Bank (2022), "[GDP per capita, PPP \(current international \\$\)](#)"

⁴⁴ The World Bank in Mali (2023), "[The World Bank in Mali](#)"

Figure	22.6M	0.43	52.9	\$386M	Conflict-affected country
Source	World Bank (2022)	UNDP (2021)	World Bank Doing Business Score (2020)	UN OCHA Financial Tracking Services (2022)	World Bank, FY24 FCAS List

FCA Context

Mali has seen a series of complex conflicts since 2012. In 2012, Northern Mali saw a series of conflicts with Tuareg independent groups insurgencies and jihadist groups that took over cities in the North such as Konna and Mopti.⁴⁵ Then between 2015 and 2020, Mali saw intertribal conflicts between the Dogon and Bambara groups, and the Fulani people over the access to natural resources. This ethnicised conflict led to militia attacks between ethnic groups.⁴⁶ And 2020 to 2023 becomes yet again a tumultuous period as a series of coup d'états follow one another and popular unrest grows demanding a transition to civilian-led government.⁴⁷ While getting accurate data on the impact of violence on agricultural groups is difficult, violence and attacks on farmers are likely attributed to lower agricultural productivity and the overall degradation of people's health and livelihoods.⁴⁸

Mali || Key Fragility, Conflict, and Migration Relevant Figures

	Governance Indicator	Global Hunger Index Score	Global Food Security Index Score	Agri as % of GDP	Arable Land	Water Stress	Population with a financial institution account	Internally displaced people
Note	Avg of all indicators -2.5 : lowest, +25: highest	<10: low alarming, 50+: extremely alarming	0: lowest, 100: highest, ranking out of 113 countries	Agri, fisheries, and forestry value-added	% of the total land	% withdrawn from total renewable source	% of population, age 15+	Number at the end of the year
Figure	-1.1	23	52 (85th)	36%	5.3%	8.0%	28%	362K
Source	World Bank WorldWide Governance Indicator (2021)	Global Hunger Index (2022)	Economist Impact, Food Security Index	World Bank (2022)	FAO (2021)	FAO Aquastat (2020)	World Bank Global Findex Database (2021)	Internal Displacement Monitoring Centre (2022)

FLWS Innovation ecosystem in the HDP nexus

The FLWS-HDP innovation ecosystem in Mali is relatively small with just under 15 innovators identified. The majority of the innovators offer solutions in the food production category but it is not yet clear as to whether there is a focal innovation area as a small number of innovators are spread across many different innovation types such as supply chain management, solar irrigation pumps, food production and crop insurance. There are 3 land management innovations, all of which work in recycling and waste management services.

Investment trends in Mali's FLWS-HDP innovation ecosystem also reflect the small and nascent ecosystem. There are 5 deals captured in the data, 3 of which are competition awards or incubator funding for Biomass4GLC, Map Action, and Maya SARL. One company that stands out is OKO Finance, a fintech and insurtech innovator providing

⁴⁵ IFPRI (2021), "[Impact of Conflict on Agriculture in Mali](#)"

⁴⁶ Human Rights Watch (2022), "[Mali: Massacre by Army, Foreign Soldiers](#)"

⁴⁷ Freedom House (2023), "[Mali: Freedom In The World 2023 Country Report Mali](#)"

⁴⁸ IFPRI (2021), "[Impact of Conflict on Agriculture in Mali](#)"

crop insurance and financial access to smallholder farmers, which raised two rounds of seed funding amounting to \$1.7M from angel and impact investors. OKO Finance demonstrates FLWS-HDP innovations utilising fintech solutions may be in a better position to scale through private investors in the startup space than some other solutions.

While the private sector innovation is still at its earlier stage of development, humanitarian and development finance institutions are mobilising resources and implementing programmes aiming to rebuild and strengthen the Malian FLWS amidst climate and socioeconomic shocks. International Committee of the Red Cross partnered with the Malian government to bring livestock vaccination and training⁴⁹ while FAO Mali is trying to mobilise up to \$30M to deliver humanitarian response food programme.⁵⁰ The World Bank released \$30M credit for the Mali Agricultural Productivity and Diversification Development Project in Semi-Arid Zones⁵¹ and IFAD has mobilised over \$350M in financing and implemented 17 agriculture projects.⁵² African Development Bank is working with the Malian government to support youth agriculture entrepreneurship development in Mali.⁵³

Box 1: INNOVATOR SPOTLIGHT - [OKO](#)

Background

OKO uses satellite imagery and forecasting to create data analytics for insurance claims management. OKO Assurance provides index insurance and micro-insurance through mobile phones for farmers in Mali. OKO partnered with Orange Mali, Sunu Assurance and Allianz Reinsurance to develop insurance products.

Business model

OKO has multiple products including data analytics services for creating index insurance products, mobile app and data API as distribution tools, and consulting services on insurance policy management. Their target demand partners range from microfinance institutions and mobile network providers to governments and NGOs.

Impact

Between 2019 and 2022, OKO Mali insured over 18,500 farmers in Mali. 97% of those farmers are first-time insurance buyers. OKO also partnered with UN Capital Development Fund and UN Women to train female-only sales agents, which increased female farmer coverage from 18% to 25%.

Scale and reach

They have scaled across different products from packaging insurance data to their own crop insurance product, OKO has also expanded into Uganda and Cote d'Ivoire.

⁴⁹ ICRC (2023), "[Mali: Livestock farming - A traditional way of life under threat](#)"

⁵⁰ FAO (2023), "[Mali: Humanitarian Response Plan 2022](#)"

⁵¹ World Bank (2022), "[Mali: Improving Agricultural Productivity and Strengthening the Resilience of Rural Households Living in Drylands](#)"

⁵² IFAD (2023), "[Mali](#)"

⁵³ AfDB (2022), "[Mali - Support program for the transformation of Malian agriculture - Youth Agricultural Entrepreneurship Component \(PATAM-EAJ\)](#)"

Box 2: HUB SPOTLIGHT - [DoniLab](#)

Background

DoniLab is a Bamako-based business incubator that supports early-stage innovators to turn their ideas into minimum viable products. DoniLab provides an accelerator programme, consulting services, co-working spaces, and a digital manufacturing facility. While DoniLab is sector agnostic, they have created FLWS-specific programmes such as Doni Green to support entrepreneurs, students and professionals in promoting a greener economy. In the Sikasso hub branch, they held a training session on hydroponic green fodder production for entrepreneurs in the livestock and agriculture sector.

Impact

Since 2015, DoniLab has incubated and accelerated close to 300 companies, of whom have raised over 800 Million CFA francs since incubation. DoniLab reports that the companies it supported have created close to 300 jobs.

Scale and Reach

DoniLab launched three additional hubs outside of Bamako. They have expanded through their diversified offerings and by partnering with regional organisations like Afric’Innov and the International Organisation of la Francophonie as well as bilateral partners like the U.S. embassy in Mali and the French Development Agency.

Mozambique | Sub-Saharan Africa

Macroeconomic Context

Mozambique is located in Southeast Africa bordering the Indian Ocean on its east coast, Tanzania, Malawi, and Zambia on the Northwest, Zimbabwe, Eswatini, and South Africa on the Southwest. Mozambique is home to 30 million people, of which 70% engage in agricultural activities.⁵⁴ Despite its wealth of natural resources, Mozambique is a low-income country with a GDP per capita of \$1,467 in 2022.⁵⁵ Mozambique’s Human Development Index is on the lower side at 0.45 signalling that health, education, and standard of living for Mozambicans can be improved. Mozambique’s doing business score of 55 is higher than the SSA average but ranks 138 out of 190 countries worldwide.⁵⁶ In 2022, Mozambique received \$323M worth of donor funding, amounting to 1.8% of its GDP that year. The World Bank classifies Mozambique as a conflict-affect state due to the ongoing insurgency attacks and subsequent internal migrations.

Mozambique || Macroeconomic Country Overview

Population	Human Development Index (HDI)	Doing Business Score	Donor Funding	World Bank List of FCAS
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⁵⁴ USAID (2023), “[Loan Portfolio Guarantee – Development Credit Authority](#)”

⁵⁵ World Bank (2022), “[GDP per capita, Purchasing Power Parity \(current international \\$\)](#)”

⁵⁶ World Bank Doing Business (2020), “[Doing Business 2020 Fact Sheet: Sub-Saharan Africa](#)”

Figure	33M	0.45	55	\$323M	Conflict-affected country
Source	World Bank (2022)	UNDP (2021)	World Bank Doing Business Score (2020)	UN OCHA Financial Tracking Services (2022)	World Bank, FY24 FCAS List

FCA Context

The top FCA conditions affecting Mozambique are internally displaced persons and food insecurity. Since 2017, Cabo Delgado Province in Northern Mozambique has been severely affected by the violent attacks by an Islamic State (ISIS) related insurgent group “Mashababos” or “Al-Shabab”. However, this non-state group is expanding into other provinces such as the Ancuabe district in Northern Mozambique, creating further disruption and terror across the country. Estimates of Internally displaced persons from attacks in the Northern coastline of Mozambique have reached 950,000 people in 2023.⁵⁷

Internal displacement is disrupting agricultural activities in a country where the vast majority of agricultural actors are smallholder farmers. Internally displaced persons lose their livelihoods and their ability to produce food as they lose access to farmland, livestock, water, and sea when they relocate to temporary housing or camps.⁵⁸ This puts over 3 million people, 10% of the total population, at high acute food insecurity and around 400,000 people at an emergency level of acute food insecurity.⁵⁹ On top of the FCA-related food insecurity, Mozambique is considered one of the most vulnerable African countries to climate change and their food insecurity is expected to increase in the coming years.⁶⁰ These factors make early interventions to stabilise sustainable food production an important agenda for Mozambique.

Mozambique || Key Fragility, Conflict, and Migration Relevant Figures

	Governance Indicator	Global Hunger Index Score	Global Food Security Index Score	Agri as % of GDP	Arable Land	Water Stress	Population with a financial institution account	Internally displaced people
Note	Avg of all indicators - 2.5: lowest, +25: highest	<10: low alarming, 50+: extremely alarming	0: lowest, 100: highest, ranking out of 113 countries	Agri, fisheries, and forestry value-added	% of the total land	% withdrawn from total renewable source	% of population, age 15+	Number at the end of the year

⁵⁷ Human Rights Watch (2023), [“World Report 2023: Mozambique”](#)

⁵⁸ FAO (2023), [“2021–2023 northern Mozambique crisis Agriculture Livelihoods Response Plan”](#)

⁵⁹ Reliefweb (2023), [“Mozambique: Mid-year 2023 Food Security Cluster Bulletin \(July 2023\)”](#)

⁶⁰ Council on Foreign Relations (2022), [“Stabilizing Mozambique”](#)

Figure	-0.87	20-34.9	47 (94th)	28%	7.2%	1.8%	37%	735K
Source	World Bank WorldWide Governance Indicator (2021)	Global Hunger Index (2022)	Economist Impact, Food Security Index	World Bank (2022)	FAO (2021)	FAO Aquastat (2020)	World Bank Global FinIndex Database (2021)	Internal Displacement Monitoring Centre (2022)

FLWS Innovation ecosystem in the HDP nexus

The FLWS-HDP innovation ecosystem in Mozambique is relatively small with 15+ innovators captured in the assessment. Food production innovations are the most prevalent among FLWS-HDP innovations. But there is no clear food production innovation type more developed than others as a small number of innovations range between biofuels, aquaculture, market linkage, and market platform for agricultural produce. The funding landscape is also limited as only two innovations, Applaud and Chicoa Fish Farm, have raised pre-seed and Series A funding.

The Mozambican ecosystem has more innovations in the migration category compared to other countries of similar ecosystem size. This reflects the size of internally displaced persons in Mozambique and that innovators are developing solutions that respond to the pain points and challenges created among the displaced population. Some examples of innovations geared towards serving migrants and displaced people in Mozambique are a digital identity service Uqudo, an e-money solution Quick-e-Pay (eKUTIVA), and M-Pesa linked mobile remittance service MamaMoney. Easier access to mobile money compared to physical banks⁶¹ and an enabling regulatory environment in the financial and telecom industries are contributors to the emergence and adoption of digital migrant services.

As the FLWS-HDP ecosystem is developing with private sector actors, humanitarian and development finance institutions are heavily engaged in injecting technical and financial support into the Mozambican FLWS-HDP ecosystem. The African Development Fund from the African Development Bank Group is issuing a \$20M grant to drive climate-smart agriculture investments⁶² and FAO is operating 6 country programmes in 2023 with over \$1M budgeted for these programmes.⁶³ IFAD has mobilised over \$400M in financing Mozambican programmes focused on increasing access to technology and services for smallholder farmers and fishers and their market participation in the longer run.⁶⁴

⁶¹ Intellectap (2021), "[Promoting A Resilient And Inclusive Private Sector In Fragile Contexts - Mozambique](#)"

⁶² AfDB (2023), "[Mozambique: African Development Fund approves \\$20 million to improve business environment and drive investments to climate-smart agriculture](#)"

⁶³ FAO (2023), "[Mozambique](#)"

⁶⁴ IFAD (2023), "[Mozambique](#)"

Box 1: INNOVATOR SPOTLIGHT - [CHICOA FISH FARM](#)

Background

Chicoa Fish Farm operates innovative fish farming facilities on Lake Cahora Bassa incorporating fishing methods that lower the cost of production and carbon footprint. The farm trains smallholder fishers in Mozambique for effective and efficient production of Tilapia.

Business model

Chicoa fish farm has its own feed plant and hatchery that they use for their own production and for sales as inputs for other farmers. They also provide all the starting equipment and training to local fishers. If the farmers they train become outgrowers or third-party farmers, they buy the fish from the farmers and sell them to the market. Target customers include retailers, catering kitchens, hotels, animal feed, and export markets.

Impact

Chicoa Fish Farm invests in local fishers to adopt new husbandry skills and increase their livelihoods. Chicoa Fish Farm partnered with the Sustainable Trade Initiative to develop a smallholder aquaculture industry model and helped rezone Lake Cahora Bassa to allocate for artisanal aquaculture.

Scale and reach

Between 2012 and 2021, Chicoa has expanded its operations to have 36 production cases and can produce over 1000 tonnes of fish per year.

Box 2: PROGRAMME SPOTLIGHT - [FEED THE FUTURE AGRICULTURAL INNOVATIONS \(FTF INOVA\)](#)

Background

USAID launched the Feed the Future Agriculture Innovations (FTF INOVA) programme to improve the efficiencies in the agriculture value chain of key cash crops in Mozambique. The programme brought together farmers, agribusinesses, agri-corporates, and policymakers to do the following:

- Farmers: 100,000 farmers, most of whom were smallholder farmers, were consulted to better understand the challenges and gap in increasing productivity. They also had access to technical assistance, training, climate-smart agriculture and improved inputs.
- Agtechs: They assisted an agtech in introducing an ICT-based logistics management platform for the Mozambican agricultural value chain.
- Agribusinesses: 100 local businesses were engaged to increase formal market linkages between smallholder farmers and formal market buyers and sellers.
- Agri-corporates/ private sector stakeholders: Corporates were engaged in input distribution, supply chain, and support services of the agriculture sector. The programme collaborated with financial institutions by co-investing and buying down risks in order to provide credit for smallholder farmers.
- Policymakers: Policymakers were consulted and collaborated in making the 2019 stocktaking report.

Impact

Between 2017 and 2022, the programme established 28 new and improved relationships with private firms including working with private firms like Bayer and Syngenta to replicate agro-advisory radio programmes piloted in the programme. Their training work and promotion of improved seed varieties reached over 16,000 hectares of land and over 100,000 people. The partner agtech Applaud was selected to participate in Norrsken's accelerator programme.

Niger | Sub-Saharan Africa

Macroeconomic Context

Niger is the largest landlocked West African country located North of Nigeria and South of Algeria and Libya. Niger's land mass is predominantly in the Sahel region and 71% of its 26M population work in agriculture.⁶⁵ The Nigerian agriculture and livestock sectors depend heavily on favourable climates but are exposed to disruptive climate shocks. In addition, long periods of government instabilities also contribute to Niger's low HDI score and a low GDP per capita of USD 1505. Niger's business regulatory environment is far from the global best practices as shown in the low doing business score, hindering the development of formal businesses. In 2022, USD 540M of donor funding went to Niger, which amounts to 4% of its GDP that year. The World Bank classified Niger as a conflict-affected state as Niger continues to experience Islamic insurgencies in its Sahel region and Niger's civilian government that aimed to make the democratic transition has been ousted by a military junta.⁶⁶

⁶⁵ World Bank (2021), "[Employment in agriculture \(% of total employment\) \(modeled ILO estimate\) - Niger](#)"

⁶⁶ CNN (2023), "[Niger soldiers claim power after president's own guards reportedly seize him](#)"

Niger || Macroeconomic Country Overview

	Population	Human Development Index (HDI)	Doing Business Score	Donor Funding	World Bank List of FCAS
Figure	26M	0.4	57	\$540M	Conflict-affected country
Source	World Bank (2022)	UNDP (2021)	World Bank Doing Business Score (2020)	UN OCHA Financial Tracking Services (2022)	World Bank, FY24 FCAS List

FCA Context

Food insecurity impacts 3.3 million or 13% of Niger’s population.⁶⁷ South-east, north-west, and south-central regions of Niger continue to experience violence and attacks from Islamic insurgencies and the population in these conflict-affected areas expect an acute food insecurity crisis.⁶⁸ Conflicts have caused over 350,000 people to be internally displaced, many of whom are farmers and pastoralists who would not be able to continue producing food. The lack of market access caused by persisting conflicts in neighbouring countries Mali and Burkina Faso as well as weakened market linkages within post-coup Niger heightens food and input prices.⁶⁹

Food assistance programmes are in danger of being interrupted due to political instabilities when many of the population need these programmes, especially in between the harvest seasons. These hostile conditions reduce farmers and pastoralists’ ability to build resilience against climate shocks that Niger is prone to and can lower household income.⁷⁰ These destabilising factors point to the need for strategic interventions to reduce food insecurity and to build longer-term resilience against political and climate shocks.

Niger || Key Fragility, Conflict, and Migration Relevant Figures

	Governance Indicator	Global Hunger Index Score	Global Food Security Index Score	Agri as % of GDP	Arable Land	Water Stress	Population with a financial institution account	Internally displaced people
Note	Avg of all indicators - 2.5: lowest, +25: highest	<10: low alarming, 50+: extremely alarming	0: lowest, 100: highest, ranking out of 113 countries	Agri, fisheries, and forestry value-added	% of the total land	% withdrawn from total renewable source	% of population, age 15+	Number at the end of the year

⁶⁷ WFP (2023), [“As political crisis rocks Niger, WFP stands firm with hunger and nutrition support”](#)

⁶⁸ FEWS NET (2023), [“Niger - Food Security Outlook June 2023 - January 2024”](#)

⁶⁹ FEWS NET (2023), [“Niger - Food Security Outlook June 2023 - January 2024”](#)

⁷⁰ IMF (2023), [“The Effects of Climate and Conflict Shocks on Household Welfare: Niger”](#)

Figure	-0.6	35.1	46 (97th)	37%	14%	11%	No information	372K
Source	World Bank WorldWide Governance Indicator (2021)	Global Hunger Index (2022)	Economist Impact, Food Security Index	World Bank (2022)	FAO (2021)	FAO Aquastat (2020)	World Bank Global Finindex Database (2021)	Internal Displacement Monitoring Centre (2022)

FLWS Innovation ecosystem in the HDP nexus

Niger's FLWS-HDP innovation ecosystem is very small and nascent. The data captures only 3 innovators in water resource management including Tech-Innov which develops irrigation and drinking water hardware and software solutions and citytaps that provides smart water meter that users can subscribe to access drinkable water. One land management innovator captured in the data was a Niger-Bioplast that created biodegradable bags from biowaste, although Niger-Bioplast no longer operates.

While private sector actors are developing the FLWS-HDP innovation ecosystem, donor organisations have been the drivers for larger-scale agriculture sector development. USAID alone has allocated close to USD 30M in agriculture and resilience programming in Niger.⁷¹ Other initiatives by Feed the Future,⁷² RISE II, and Development Finance Corporation⁷³ have introduced programmes to strengthen Niger's FLWS. However, the outcomes from the recent military activities triggered some programmes such as assistance by Millenium Challenge Corporation to pause their activities in Niger.⁷⁴ Amidst the continued conflict and fragility, developing the Nigerien FLWS-HDP ecosystem through the private sector will require careful partnership with experienced implementation partners and willing government counterparts.

⁷¹ USAID (2023), "[Niger Agriculture Fact Sheet July 2023](#)"

⁷² FiF (2023), "[Niger](#)"

⁷³ USAID (2023), "[Niger Agriculture Fact Sheet July 2023](#)"

⁷⁴ MCC (2023), "[MCC Board Suspends Assistance to Niger, Approves FY2024 Selection Criteria and Methodology Report](#)"

Box 1: INNOVATOR SPOTLIGHT- [Tele Irrigation](#) by Tech-Innov

Background

Tele Irrigation is a hardware-software water pumping kit developed to improve water access and irrigation infrastructure for Nigerien farmers. Tele irrigation pump is equipped with a SIM card so a farmer can activate the pump by dialling a code on their phone. Users can also access environmental information to get advice on watering times.

Business model

Tele Irrigation has a B2C model where individual farmers and consumer groups would purchase the Tele Irrigation kit from the parent company Tech-Innov. The kit costs about FD 20,000 and can be paid in instalments after putting down a 40% deposit. The producers of the Tele Irrigation kit pay Tech-Innov a licensing fee and technical assistance fee to produce the hardware.

Impact

Tech Innov's products have reached over 200 individuals and collective farms and have shown 60% of water resources saved compared to other watering methods. Farmers using the water-saving solution were able to generate more income on average.

Scale and reach

Since the development of the parent company Tech-Innov, the entrepreneur Abdou Maman Kane also created other solutions such as drinking water kiosks, automatic watering tools, and mobile weather stations.

Box 2: PROGRAMME SPOTLIGHT - [NIGER IRRIGATION PROGRAM \(NIP\)](#)

Background

The Niger Irrigation Program (NIP) is a partnership between the International Finance Corporation (IFC), Climate Investment Fund, and micro-irrigation technology company Netafim to instal solar powered drip-irrigation systems across Niger. The project commenced in 2014 and completed in 2020. Climate Investment Funds and IFC unconventionally provided a grant to private sector partner Netafim to provide irrigation equipment to encourage the private sector market development in the agricultural value chain.

Impact

The NIP showed the positive impact of private sector participation in improving the Nigerien agricultural sector. The programme trained over 900 farmers, 60% of whom were women farmers, and the farmers saw an increase in yield by 80% and in revenue by 31-72%. The NIP helped raise awareness of the benefits of drip irrigation and introduced a mobile maintenance system to help provide last-mile support for rural farmers. Netafim partnered with agriculture universities to develop local agent and field assistant training programmes. The field assistants would be embedded in the farming communities so that they would effectively provide customer service and community engagement throughout the programme.

Scale and Reach

The NIP has operations in seven regions in Niger, installing irrigation pumps across 45 hectares in 31 sites.

Nigeria | Sub-Saharan Africa

Macroeconomic Context

Nigeria is a middle-income country located on the West coast of Africa and is home to more than 219 million people.⁷⁵ Nigeria's Human Development Index score of 0.54 indicates low levels of life expectancy, education, and decent standard of living. Nigeria's doing business score of 57 shows that its regulatory environment is business-friendly in some aspects with room for improvement. Donor funding in 2022 was in a high range of USD 855M, accounting for 0.1% of Nigeria's GDP in the same year. The World Bank classifies Nigeria as a conflict-affected state as conflicts inflaming the North-East regions of Nigeria continue on.

Nigeria || Macroeconomic Country Overview

Population	Human Development Index (HDI)	Doing Business Score	Donor Funding	World Bank List of FCAS
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⁷⁵ World Bank (2022), "[Population, total - Nigeria](#)"

Figure	219M	0.54	57	\$854M	Conflict-affected country
Source	World Bank (2022)	UNDP (2021)	World Bank Doing Business Score (2020)	UN OCHA Financial Tracking Services (2022)	World Bank, FY24 FCAS List

FCA Context

Nigeria's main conflict-related issues are in weak governance, high food insecurity, and internal migration. In Nigeria, conflict, climate, and food security are directly linked. Across three Northern states (Adamawa, Borno, Yobe), 3 million people are internally displaced, and 4.1 million are food insecure. A total of 8.4 million are food insecure in the northeast. The northern areas of the country are home to more than 70% of agricultural activity, but disruptions to production and distribution have resulted in significant shortages and post-harvest losses of crops such as maize.⁷⁶ Borno is at the centre of the conflict, where violence and economic difficulties have caused immense social hardship, heightened food insecurity, and added pressure to the resource environment.⁷⁷ In fact, persistent violence has been one of the leading causes of reduced food access, and widespread flooding during the rainy season in 2022 caused damage to more than 676 thousand acres of farmland and diminishing harvests. The combination of conflict, climate change, more extreme and frequent weather events, inflation, and rising food prices has led to projections of more than 25 million people facing hunger in 2023.⁷⁸

Nigeria || Key Fragility, Conflict, and Migration Relevant Figures

	Governance Indicator	Global Hunger Index Score	Global Food Security Index Score	Agri as % of GDP	Arable Land	Water Stress	Population with a financial institution account	Internally displaced people
Note	Avg of all indicators - 2.5: lowest, +25: highest	<10: low alarming, 50+: extremely alarming	0: lowest, 100: highest, ranking out of 113 countries	Agri, fisheries, and forestry value-added	% of the total land	% withdrawn from total renewable source	% of population, age 15+	Number at the end of the year
Figure	-1.1	27	42 (107th)	24%	41%	9.7%	0.45%	3.2M
Source	World Bank WorldWide Governance Indicator (2021)	Global Hunger Index (2022)	Economist Impact, Food Security Index	World Bank (2022)	FAO (2021)	FAO Aquastat (2020)	World Bank Global Findex Database 2021	UNHCR (2020)

FLWS Innovation ecosystem in the HDP nexus

Nigeria has a fast-growing innovation landscape, cutting across a broad range of sectors and actors. The digital and tech startup ecosystem is most prevalent in the Southern states, such as Lagos and Abuja. The distribution of innovation has been greatly impacted by years of conflict, many of which persist to this day.

⁷⁶ Prevention Web (2022), "[Nigeria's food system challenged by conflicts, climate change and economic headwinds](#)"

⁷⁷ WFP (2023), "[Nigeria](#)"

⁷⁸ UNICEF (2023), "[25 million Nigerians at high risk of food insecurity in 2023](#)" | press release

Although the majority of agricultural activities take place in the North, the functioning of the FLWS-HDP affects the whole country. A lot of the funding directed towards the northern region has been used for humanitarian purposes,⁷⁹ and much of the innovation ecosystem is nascent and decentralised. Many FLWS-HDP innovators also tend to register outside of FCAS states, making it difficult to track which innovations are specifically addressing the needs of the FCAS.

The FLWS-HDP innovation ecosystem in Nigeria is active and developed as over 250 FLWS-HDP innovators are operating in Nigeria. They work across 29 different sectors relevant to FLWS, with food production being the most prevalent innovation area, followed by land management. 80+ deals by FLWS-HDP innovators raised a total volume of \$195M in funding since 2015. While the ecosystem is larger than most other FCAS countries covered in this study, investor interest in FLWS-HDP innovators developed in the last 3 years as larger ticket-size deals occurred between 2020 and 2023.

Nigeria's FLWS-HDP ecosystem is active at the country level but there is a need to bridge the innovations to the FCA regions. Luther Lawoyin, the CEO of PricePally, shares that the main challenges that disconnect the Southern markets from the agricultural lands in the conflict-affected North are unstable business environment and the lack of value chain actors that can store, transport and process the harvested produce from the farmers to the consumers end. However, Lawoyin also mentioned that research institutions can play an important role in businesses expanding into conflict-affected areas by advising businesses and improving the overall productivity of farmers.

Box 1: INNOVATOR SPOTLIGHT - [PricePally](#)

Background

PricePally is a digital food co-operative established in 2019 that collaborates with farmers to deliver fresh and affordable food to customers across cities in Nigeria.

Business model

The company aggregates consumer demand and connects directly to supply from farmers, manufacturers, brands and wholesalers, leveraging technology, data and partnerships.

Impact

One of the objectives of the company is to tackle food insecurity in the context of weak production, poor distribution systems, and reliance on imports. According to PricePally CEO, Luther Lawoyin, there is an inefficiency that occurs whereby transport of food from rural areas to urban areas is expensive, resulting in increased prices for consumers and reduced quality and freshness of food. Poor road infrastructure between the North and South is therefore an additional barrier on top of the ongoing conflict.

Scale and reach

PricePally received a 6-digit early-stage funding round in 2021, and recently closed \$1.3m seed funding. PricePally is set to serve over 1000 customers per day.

⁷⁹ OCHA (2023), "[US\\$1.3 billion needed to reach 6 million people in North-East Nigeria with humanitarian assistance in 2023](#)"

Box 2: PROGRAMME SPOTLIGHT - [Village Capital's Migrants Accelerator Programme](#)

Background

Migrant's accelerator programme is an accelerator for impact-driven startups developing bold solutions that have the potential to increase the financial inclusion of migrants, including refugees, and especially targeting women.

Impact

The accelerator's aim is to contribute to improving the ability of the products and services represented to fit the needs of migrant women and build and develop partnerships that drive broad awareness of the challenges and opportunities in the space, catalysing investment, storytelling and other essential support for these solutions.

Scale and Reach

The accelerator has identified and scaled 30+ startups addressing financial inclusion challenges for migrants, particularly migrant women across Africa, the Middle East and South Asia through a combination of intensive in-person and virtual investment readiness training and platform-based long-term support.

Somalia | Sub-Saharan Africa

Macroeconomic Context

Somalia is a country located in the Horn of Africa bordering the Indian Ocean and the Gulf of Aden on its north and eastern border, and bordering inland Ethiopia, Djibouti, and Kenya. Somalia's population is 18 million people, 26% of which are employed in the agricultural sector⁸⁰ and a higher proportion of the population is likely engaged in informal and subsistence farming and pastoral work. Somalia is a low-income country with a GDP per Capita of USD\$1,364 in 2022. Somalia's doing business score of 20 ranks Somalia in last place in the global ranking, reflecting significant constraints on the local business environment. In 2022, Somalia received USD 2.2 billion in donor funding, amounting to 27% of Somalia's GDP that year. The World Bank classifies Somalia as a conflict-affected state as Somalia still experiences state-wide conflicts stemming from decades of civil wars and insurgencies.

Somalia || Macroeconomic Country Overview

	Population	Human Development Index (HDI)	Doing Business Score	Donor Funding	World Bank List of FCAS
Figure	18M	No information	20	\$2.2B	Conflict-affected country
Source	World Bank (2022)	UNDP (2021)	World Bank Doing Business Score (2020)	UN OCHA Financial Tracking Services (2022)	World Bank, FY24 FCAS List

FCA Context

Decades of civil war and the ongoing conflicts with armed group Al-Shabaab have left millions of Somalis internally displaced. In addition, the consecutive failed rain seasons have left 1.4 million people internally displaced looking

⁸⁰ World Bank (2021), "[Employment in agriculture \(% of total employment\) \(modeled ILO estimate\) - Somalia](#)"

for food security in 2023 alone.⁸¹ Conflict is the most prevalent in south-central areas of Somalia where Al-Shabaab have taken control.

The high level of food insecurity in Somalia is a compounded result of conflicts and hostile weather conditions. The conflict has had a negative impact on the Somali FLWS⁸² as many have been forced to flee their farming or grazing lands. More recently, the high level of informal taxation and control of territories by armed groups make farming an unsafe and unfeasible practice for many. The prolonged conflict has also diminished the number of financial institutions and businesses available, which in turn cannot fund agribusinesses and provide inputs for farmers. On top of that, after having gone through a devastating famine in 2011 and 2012, Somalia still experiences severe food insecurity from droughts between 2018-2023⁸³ and floods in 2019-2020.⁸⁴ The Global Hunger Index puts Somalia at an alarming level in 2022. The UN's analysis estimated that about 6.6 million people⁸⁵ (37% of its population) will likely experience high levels of acute food insecurity in 2023. Conflicts exacerbate food insecurity caused by climate-related incidents, as conflict reduces access to drought-resilient inputs and timely access to equipment.

Despite all these socioeconomic and climate shocks, Somalia's economy started recovering in 2022.⁸⁶ The World Bank reported that as Somalia transitions out of fragility, the country needs to carefully transition the resources and strategies from humanitarian aid to longer-term development plans.

Somalia || Key Fragility, Conflict, and Migration Relevant Figures

	Governance Indicator	Global Hunger Index Score	Global Food Security Index Score	Agri as % of GDP	Arable Land	Water Stress	Population with a financial institution account	Internally displaced people
Note	Avg of all indicators - 2.5: lowest, +25: highest	<10: low alarming, 50+: extremely alarming	0: lowest, 100: highest, ranking out of 113 countries	Agri, fisheries, and forestry value-added	% of the total land	% withdrawn from total renewable source	% of population, age 15+	Number at the end of the year
Figure	No information	35-49.9	No information	63%*	1.8%	25%	No information	3.9M
Source	World Bank WorldWide Governance Indicator (2021)	Global Hunger Index (2022)	Economist Impact, Food Security Index	World Bank *1990 is the most recent data	FAO (2021)	FAO Aquastat (2020)	World Bank Global Findex Database 2021	Internal Displacement Monitoring Centre (2022)

FLWS Innovation ecosystem in the HDP nexus

Given the complexity and urgency of food insecurity issues in Somalia, the FLWS-HDP innovation ecosystem is mostly driven by donor organisations and development finance institutions. In 2022, the World Bank granted USD 70 million in the "Barwaaqo" programme that supports increased access to water resources and the adoption of climate-smart

⁸¹ WFP (2023), "[Somalia emergency](#)"

⁸² Harvard Humanitarian Initiative (2023), "[Conflict And Food Systems - Somalia Report](#)"

⁸³ NRC (2023), "[How severe is Somalia's food crisis?](#)"

⁸⁴ Care (2023), "[Somalia Food Insecurity Crisis](#)"

⁸⁵ IPC (2023), "[Somalia: IPC Food Security & Nutrition Snapshot | March - June 2023 \(Published on April 25, 2023\)](#)"

⁸⁶ World Bank (2022), "[Somalia's Economy Expected to Grow Despite Significant Shocks](#)"

agriculture practices across Somalia.⁸⁷ In 2023, IFAD resumed their direct investment engagements with Somalia⁸⁸ after member states helped clear Somalia's debt arrears that previously suspended loans to Somalia. IFAD has been mobilising grants for programmes supporting pastoralists, rehabilitation of irrigation, and bringing in key inputs that can help the Somali population become more adaptive and resilient to economic and climate shocks.

While donor engagement in Somali FLWS-HDP innovation is actively documented, data on FLWS-HDP innovations in the private sector remains limited. Just 7 FLWS-HDP innovators were identified in the mapping, and none of them raised publicly disclosed funding from private sector investors. Poor infrastructure and low access to quality inputs and veterinary services are just a few of the factors contributing to unfavourable conditions for innovation. In addition, high rates of migration and low education quality in Somali agriculture schools also present challenges for fostering technical innovations in the FLWS-HDP ecosystem.⁸⁹

Nevertheless, the data captures a few innovations in the migration and anticipatory action categories. These innovations enable displaced and migrating Somali populations to have better access to mobile money, health services, and energy sources. Most of these innovations operate outside of Somalia and partner with NGOs or humanitarian donors to distribute their products in Somali refugee camps. SolarGen is a Kenyan off-grid solar hardware company but they raised interest-free seed capital from Somalia Stability Fund⁹⁰ to set up a solar water pump that can supply water to internally displaced people in Mogadishu.⁹¹

The enabling policies in host communities also help innovators to introduce innovations in refugee and displaced person camps. The 2019 Refugee Proclamation in Ethiopia enabled refugees access to telecom and banking services. This in turn helped HelloCash, a mobile money solution accredited through Shabelle Bank in Ethiopia, to partner with SHARPE to introduce digital financial services in refugee camps in the Somali Region of Ethiopia where over 200,000 Somali refugees reside.⁹²

⁸⁷ World Bank (2022), "[World Bank Grants \\$70 Million for Delivery of Water, Agriculture, Livestock, and Environmental Services in Somalia](#)"

⁸⁸ IFAD (2023), "[IFAD substantially strengthens its investments in Somalia to help small-scale producers cope with climate shocks and food insecurity](#)"

⁸⁹ IMF (2022), "[Somalia: Selected Issues](#)"

⁹⁰ Somalia Stability Fund (2023), "[Somalia Stability Fund - Phase III has started](#)"

⁹¹ SolarGen Technologies, SolarGen Journey, "[About SolarGen](#)"

⁹² DAI (2022), "[Digital Financial Services – A Step Towards Financial Inclusion for Refugees](#)"

Box 1: INNOVATOR SPOTLIGHT - [OGOW Health](#)

Background

OGOW Health digitises medical records and provides mobile health solutions for healthcare providers and patients in Somalia. OGOW's products are designed to improve patient access to records, healthcare policies, and caretaker operations. The OGOW platform allows other actors such as NGOs, administrators, and government actors to access consolidated data on health indicators. OGOW Health is a social enterprise and has been funded by the Canadian Government and the Fund for Innovation and Transformation.

Business model

OGOW Health has a B2B and B2G business model as they offer the mobile health solution to healthcare providers, caregivers, and governments.

Impact

OGOW Health adopts a community-centric approach to work with patients to develop and improve the OGOW health platform. The collection of health records and the flow of information help concert efforts of various humanitarian agencies and can help the transition between humanitarian efforts to longer-term development work.

Scale and reach

OGOW Health has worked with over 15,000 people in testing and improving their platform. They are supported through IDEO and the Gates Foundation.

Box 2: COLLABORATIVE ECOSYSTEM ENABLER SPOTLIGHT - [Somali Agriculture Technical Group \(SATG\)](#)

Background

SATG is a research organisation that collaborates with national and international research organisations to test, develop and produce superior crop varieties in Somalia. They specialise in technology transfer and sharing agriculture good practices. They also work with younger talents to bring out entrepreneurial efforts in the FLWS-HDP sectors.

Impact

SATG work closely with Somali farmer cooperatives and provides training on producing high-quality seeds. They also deploy field extension workers to provide hands-on guides to the cooperatives.

Scale and Reach

SATG works on seed development, livestock farming research, training, environment and biodiversity research, monitoring and evaluation. Their access to the government ministry and farming cooperatives positions SATG as a distribution and implementation partner. SATG also advocates for better seed system development and production policies for high-level impact and reach.

Zimbabwe | Sub-Saharan Africa

Macroeconomic Context

Zimbabwe is a landlocked country in southern Africa that borders South Africa, Mozambique, Zambia, and Botswana. Zimbabwe's population is 16 million people, of which 62% are employed in agriculture.⁹³ Zimbabwe is a lower middle-income country with a GDP per capita of USD 2,530 in 2022. Zimbabwe's Human Development Index of 0.593 places Zimbabwe the highest among other SSA countries in the study but is below the global average. However, a business score of 54.5 places Zimbabwe at 140th place out of 190 countries, signalling that Zimbabwe's regulatory space has room to grow. In 2022, Zimbabwe received USD 99 million in donor funding, which amounts to 0.5% of the country's GDP that year. The World Bank categorises Zimbabwe as a fragility-affected state due to the combination of undemocratic elections, political and media repression, state-led human rights violations, and mistrust in the government.⁹⁴

Zimbabwe || Macroeconomic Country Overview

Population	Human Development Index (HDI)	Doing Business Score	Donor Funding	World Bank List of FCAS
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⁹³ World Bank, Employment in agriculture (2021), "[Employment in agriculture \(% of total employment\) \(modeled ILO estimate\) - Zimbabwe](#)"

⁹⁴ Council on Foreign Relations (2023), "[Zimbabwe's Flawed Election Results Meet With Regional Skepticism](#)"

Figure	16M	0.59	55	\$99M	Fragility-affected country
Source	World Bank (2022)	UNDP (2021)	World Bank Doing Business Score (2020)	UN OCHA Financial Tracking Services (2022)	World Bank, FY24 FCAS List

FCA Context

Zimbabwe is affected by its fragile government where a de facto one-party rule has resulted in high corruption and misallocation of funds needed for the larger population.⁹⁵ The mismanagement of public funds and the overall slowdown of the economy had a cascading impact on the agriculture sector where both cash crop and food crop farmers lose access to key inputs, experience weak market linkages, and become less adaptable to climate change. Timely access to inputs and market linkages is particularly important for the Zimbabwe agricultural sector as it relies more on rainfall rather than irrigation⁹⁶ when droughts are their biggest agriculture risk factor.⁹⁷ Fragility also impacts the capacity building and protection of smallholder farmers, who are the largest portion of the agriculture labour force in Zimbabwe, as they work in informal sectors with little labour protection and low production capacity.⁹⁸

Zimbabwe || Key Fragility, Conflict, and Migration Relevant Figures

	Governance Indicator	Global Hunger Index Score	Global Food Security Index Score	Agri as % of GDP	Arable Land	Water Stress	Population with a financial institution account	Internally displaced people
Note	Avg of all indicators - 2.5: lowest, +25: highest	<10: low alarming, 50+: extremely alarming	0: lowest, 100: highest, ranking out of 113 countries	Agri, fisheries, and forestry value-added	% of the total land	% withdrawn from total renewable source	% of population, age 15+	Number at the end of the year
Figure	-1.2	20-34.9	No information	9%	10%	35%	29%	0
Source	World Bank WorldWide Governance Indicator (2021)	Global Hunger Index (2022)	Economist Impact, Food Security Index	World Bank (2022)	FAO (2021)	FAO Aquastat (2020)	World Bank Global Findex Database 2021	Internal Displacement Monitoring Centre (2022)

FLW Innovation ecosystem in the HDP nexus

Zimbabwe has a relatively small FLWS-HDP innovation ecosystem. The mapping captured around 15 innovators founded between 2010 and 2019. Most of the innovations offer services on food production and some on land management and migration. Creating connections between farmers and consumers is one of the most prevalent product types for Zimbabwean food production innovations. But there is a variety of product types represented among the innovators such as Mbeu Yedu which provides a mobile wallet for farmers to Fresh in a Box which delivers fresh produce boxes from smallholder farmers to consumers. The Land Management category shows a few circular

⁹⁵ Carleton University (2020), "[Fragility Analysis of Zimbabwe: Policy Recommendations for USAID](#)"

⁹⁶ OCED (2011), "[Effective Support for Agricultural Development: Joint Study Visit to Zimbabwe](#)"

⁹⁷ World Bank (2019), "[Zimbabwe: Agriculture Sector Disaster Risk Assessment](#)"

⁹⁸ World Bank (2019), "[Zimbabwe: Agriculture Sector Disaster Risk Assessment](#)"

economy companies like Vital Recycling provide plastic waste recycling services for commercial retailers and Farai Pyro is developing a diesel production technology using plastic waste.

5 of the Zimbabwean innovators have received formal funding. One of the noticeable deals is Farmhut which raised a \$100,000 grant by winning the Hult Prize competition.⁹⁹ While there is not enough data to drive more insights on the funding landscape, the small number of deals, the small ticket size grants, and the sources of funding being from competitions and angels indicate that the ecosystem is still very nascent and that the enabling ecosystem has room to grow.

There are also public sector or donor-driven programmes to activate the FLW-HDP innovation ecosystems such as the Zimbabwe Agriculture Growth Programme where the EU is mobilising €40 million to strengthen livestock value chains across 10 provinces across Zimbabwe.¹⁰⁰ World Food Programme is collaborating with the Government of Zimbabwe to develop the 2022-2027 Country Strategic Plan that will take into consideration more social protection and food security.

Box 1: INNOVATOR SPOTLIGHT- [VIRL Financial Services](#)

Background

VIRL Financial Services was founded in 2010 by two women to provide more inclusive financial services to the rural population and to connect vulnerable populations (women and youth) to businesses. VIRL provides loans in the areas of agriculture/input, value chain finance, asset finance, life enhancement, and working capital.

Business model

VIRL developed five 2B loan products that use the Community Banking Methodology for micro-enterprises and the Individual Lending Methodology for SMEs. Their products are delivered across Zimbabwe through a network of branches and satellite locations. VIRL works with different stakeholders such as USAID, FAO, and local and national governments to run programmes in the agricultural sector.

Impact

VIRL Financial services have the mandate to focus on rural financing with a potential reach to women and youth. In order to do so, VIRL holds e-learning for businesses, social development programmes on financial education, gender focus group discussions, and social analysis and action training. VIRL has reached out to 11,000 women through loans and financial education.

Scale and reach

Since their inception, they have expanded their financial products into multiple areas for farmers, value chain actors, and the broader SME actors. They also operate 7 branch offices across Zimbabwe and have won multiple awards for their financial inclusion work with underbanked rural and agricultural populations.

⁹⁹ Disrupt Africa (2021), "[Zimbabwe agri-tech startup wins \\$100k grant funding from Hult Prize](#)"

¹⁰⁰ Zimbabwe Agricultural Growth Programme (2022) <https://zagp.org.zw/>

Box 2: PROGRAMME SPOTLIGHT- [Zimbabwe Agriculture Competition Program by DAI & USAID](#)

Background

Between 2010 and 2015, USAID commissioned Development Alternatives Incorporated (DAI) to vitalise Zimbabwe's agriculture sector competition through a private sector-led programme. This programme engaged private sectors in policymaking and provided technical and grant support to private and PPP institutions.

Impact

This programme helps strengthen representative institutions by involving the main farmer organisation to host the programme on facilitating national dialogues on agribusiness competitiveness. It also improved market infrastructure by providing direct technical and grant support. Offering of agro-extension services through cascaded business service provider training and targeted grants also improved agrobusiness productivity.

Scale and Reach

The programme reestablished a market information system for 600 horticulture and livestock players, developed websites for farmer and agribusiness groups to improve communication, increased profitability of 511 agricultural and food security-related firms, and trained 170+ leaders of farmer organisations (40% of them women).

Jordan | Middle East

Macroeconomic Context

Jordan, with a population of approximately 11 million, boasts a Human Development Index of 0.72, indicating relatively high human development. The country's Doing Business Score of 69 out of 100 reflects a moderately favourable business environment. Jordan received \$594 million in donor funding in 2022, which is about 1.3% of its GDP that same year, to support various development initiatives and refugee response programmes. Jordan is not classified as a country affected by FCAS by the World Bank, suggesting relative stability in comparison to many other neighbouring countries facing fragility and conflict.

Jordan faces several macroeconomic challenges. The country has a small, open economy with limited natural resources, making it highly dependent on foreign aid, remittances, and trade.¹⁰¹ Jordan's economy has been grappling with fiscal deficits and high levels of public debt, driven by increased government spending, subsidies, and the cost of hosting a large number of refugees from neighbouring countries, particularly Syria.¹⁰² Ongoing geopolitical instability in the region, limited natural resources, and the economic impacts of the pandemic continue to pose challenges to Jordan's macroeconomic stability.

Jordan || Macroeconomic Country Overview

Population	Human Development Index (HDI)	Doing Business Score	Donor Funding	World Bank List of FCAS
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¹⁰¹ World Bank (2022), "[Publication: Jordan Country Climate and Development Report](#)"

¹⁰² UNHCR (2023), "[Jordan](#)"

Figure	11M	0.72	69	\$594M	Not classified as FCAS
Source	World Bank (2022)	UNDP (2021)	World Bank Doing Business Score (2020)	UN OCHA Financial Tracking Services (2022)	World Bank, FY24 FCAS List

FCA Context

The most pressing fragility and conflict issues in Jordan include the strain on resources due to the influx of refugees, regional geopolitical tensions, economic challenges, and societal concerns related to political reforms. Jordan hosts close to 700,000 or more refugees from conflicts in neighbouring Syria, Iraq, and Yemen.¹⁰³ This increase in residents has stretched already limited FLW resources.

Jordan is increasingly facing food security challenges due to its limited arable land and water resources. The country's ability to produce enough food domestically is constrained, leading to a reliance on food imports and making Jordan's food system vulnerable to external shocks, including regional conflicts that can disrupt supply lines.¹⁰⁴ Land disputes, especially around border areas, can contribute to local tensions and conflicts. Additionally, competition for land resources can be a source of fragility in rural areas.¹⁰⁵ Jordan is one of the most water-scarce countries globally, and water scarcity is a significant issue in both conflict-affected and non-conflict-affected regions.¹⁰⁶ Water-related conflicts can emerge due to resource scarcity, and the country has been actively implementing water management strategies to address these challenges.¹⁰⁷

Jordan || Key Fragility, Conflict, and Migration Relevant Figures

	Governance Indicator	Global Hunger Index Score	Global Food Security Index Score	Agri as % of GDP	Arable Land	Water Stress	Population with a financial institution account	Number of Refugees
Note	Avg of all indicators - 2.5: lowest, +25: highest	<10: low alarming, 50+: extremely alarming	0: lowest, 100: highest, ranking out of 113 countries	Agri, fisheries, and forestry value-added	% of the total land	% withdrawn from total renewable source	% of population, age 15+	Number at the end of the year
Figure	-0.075	11	66 (47th)	4.6%	2.3%	104%	43%	698K
Source	World Bank WorldWide Governance Indicator (2021)	Global Hunger Index (2022)	Economist Impact, Food Security Index	World Bank (2022)	FAO (2021)	FAO Aquastat (2020)	World Bank Global Findex Database 2021	UNHCR (2022)

FLWS Innovation ecosystem in the HDP nexus

Jordan has a relatively developed FLWS-HDP innovation ecosystem when compared to the other FCAS countries covered in this study. The mapping captured 85+ FLWS-HDP innovators operating in Jordan, half of which are in the

¹⁰³ WHO (2023), "[Refugees and migrant health country profile: Jordan](#)"

¹⁰⁴ AL-Jasasbeh, Omar (2022), "[Supply chains and COVID-19 impact on Jordan's, countermeasures and post-COVID-19 era](#)"

¹⁰⁵ Foreign Policy Research Institute (2018), "[Jordan and Israel: A wake up call along a quiet border](#)"

¹⁰⁶ UNICEF (2023), "[Water, sanitation and hygiene](#)"

¹⁰⁷ Al-Addous, Bdour, Alnaief et al (2023), "[Water Resources in Jordan: A Review of Current Challenges and Future Opportunities](#)". Water Resources and Sustainable Development. DOI: <https://doi.org/10.3390/w15213729>.

food production category. Innovative food production solutions such as hydroponics, precision agriculture, and vertical farming are represented in the ecosystem, addressing challenges posed by Jordan's limited arable land and water resources. The land management category is the second largest in the Jordanian FLWS-HDP ecosystem, where recycling solutions and waste management services are the most prominent. As Jordan is a large refugee host country, there are a number of migrant-related solutions offering services such as financial inclusion for migrants, refugee tech, digital identity, and sustainable housing.

The investment landscape in the Jordanian FLWS-HDP ecosystem shows that the ecosystem is still at an early stage with a few large deals over \$1M. Out of 16 deals captured in the data, half of them are at the seed or pre-seed stage, with ticket sizes under \$50K. Innovators that have scaled include ArabiaWeather and SIRCLES. ArabiaWeather is a B2B weather forecasting service that has raised over \$7M from impact and commercial investors. SIRCLES is a project funded by the EU and implemented by a multilateral organisation to process organic waste and produce organic fertilisers. Outside of these two examples, the rest of the funded innovators are receiving seed or pre-seed funding in the form of grants, awards, and non-equity assistance through incubators and accelerators.

It is important to note that the data mapping captures general FLWS-HDP innovations operating in Jordan with the assumption that these innovations have the potential to be adapted to meet areas and populations more affected by conflict and migration. The case study of Dinarak below demonstrates how a solution can be targeted and adapted to benefit the host communities and refugees.

Box 1: INNOVATOR SPOTLIGHT- [Dinarak](#)

Background

Dinarak is an impact-driven mobile payment innovator who is licensed by the Central Bank of Jordan. Dinarak products include personal wallets, business payment systems, and e-bill pay. Dinarak was the first mobile payment service to enter the refugee camps and onboard both refugee and host community members who previously did not have access to formal financial services. Dinarak also works with governments and NGOs to help disperse funds to target groups via their digital wallets, creating access to financial services and access to food products for refugee populations.

Business model

Dinarak has multiple business models including B2C Dinarak visa cards, P2P mobile wallet solutions, B2B payment and salary management services, B2G humanitarian, development agency, and government programme services.

Impact

Dinarak is trying to increase the financial inclusion of Jordanians and Jordanian residents by providing easier access to financial services. Their agent network can reach underserved populations - rural, women, and refugees - better than formal banking branches. Dinarak also conducts financial inclusion awareness training and training for women mobile money agents.

Scale and reach

Dinarak's mobile money agents operate in over 1450 locations across Jordan and have integrated over 3000+ businesses in the business digital financial services segment. Dinarak also has a track record of working in partnership with The Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), AVSI Foundation, and International Rescue Committee (IRC) to provide digital aid disbursement solutions for target groups of partner programmes.

Box 2: ENABLER SPOTLIGHT- [WFP BUILDING BLOCKS](#)

Background

Building Blocks is a privately managed blockchain network that connects humanitarian organisations to coordinate their assistance programmes. Building Blocks helps different organisations record and track their target group's access and receipt of resources so that resource allocation can be more equitable. Building Blocks is a corporate project of the World Food Programme.

Business model

The Building Blocks network is a neutral network that is co-owned and co-operated by member organisations. The blockchain infrastructure comes from an open-source software and the applications used on BB can be used for free for member organisations.

Impact

WFP introduced Building Blocks in Jordan in 2017 to coordinate assistance programmes for Syrian refugees. Between 2017 and 2023, Building Blocks supported 106,000 people with food assistance and has redirected over \$2.4M that was saved from transaction fees in Jordan. Globally, over 4 million people are supported every month and over 500 million transactions totalling \$325M have been dispersed through the coordinated efforts on Building Blocks.

Scale and reach

From its pilot programme in Jordan in 2017, Building Blocks scaled up to service 1 million people in 2021. Building Blocks has become the largest blockchain-based cash and assistance distribution system in the humanitarian sector and now operates in Bangladesh, Jordan, Lebanon, and Ukraine.

Yemen | Middle East

Macroeconomic Context

Yemen, with a population of 33.7 million, faces a deeply challenging situation as reflected by its Human Development Index of 0.46, signifying low human development. The country's Doing Business Score of 31.8 out of 100 underscores the harsh economic environment resulting from ongoing conflict, linked to the civil war that began in 2014 between Houthi insurgents and the government, backed by a Saudi-led military coalition.¹⁰⁸ As a result, Yemen has been classified as a conflict-affected state by the World Bank for several years. Donor funding, equalling \$2.7 billion in 2022 has been crucial to address humanitarian needs and mitigate the impact of the longstanding conflict.

The lack of political stability has deterred foreign investment and economic growth, with Yemen experiencing a depreciating currency and hyperinflation.¹⁰⁹ The Yemeni rial's devaluation has significantly eroded the purchasing power of citizens, making basic necessities increasingly unaffordable. The humanitarian situation remains dire, with two-thirds of Yemenis, or 21.6 people including 11 million children, in need of assistance for food, healthcare, and shelter¹¹⁰. The conflict has disrupted aid delivery and access to vital services, further exacerbating the crisis. Yemen's

¹⁰⁸ Council on Foreign Relations (2023), "[Global Conflict Tracker: War in Yemen](#)"

¹⁰⁹ AlJazeera (2022), "[Yemeni currency devaluation persists, despite new leadership](#)"

¹¹⁰ Save the Children (2023), "[Humanitarian aid in Yemen slashed by over 60% in five years](#)"

economic prospects are highly contingent on achieving a peaceful political resolution and the extensive reconstruction of infrastructure and institutions, with the immediate priority being the alleviation of the ongoing humanitarian catastrophe.¹¹¹

Yemen || Macroeconomic Country Overview

	Population	Human Development Index (HDI)	Doing Business Score	Donor Funding	World Bank List of FCAS
Figure	34M	0.46	32	\$2.7B	Conflict-affected country
Source	World Bank (2022)	UNDP (2021)	World Bank Doing Business Score (2020)	UN OCHA Financial Tracking Services (2022)	World Bank, FY24 FCAS List

FCA Context

Yemen's food, land, and water systems are profoundly impacted by the fragility and conflict affecting the country. The ongoing conflict has disrupted agricultural production, distribution, and access to food, exacerbating food insecurity for a significant portion of the population. With limited arable land, Yemen heavily relies on imports to meet its food needs, and conflict-related disruptions to supply chains have led to food shortages and soaring prices. Furthermore, the damage to infrastructure has hindered the transportation of goods, making it difficult for food to reach those in need, particularly in conflict-affected areas.¹¹²

Land resources in Yemen are strained due to population displacement and competition in conflict-affected regions. The scarcity of arable land, coupled with the displacement of people due to conflict, has intensified the competition for limited land resources, causing land-related grievances and disputes.¹¹³ Similarly, Yemen's water resources have been severely affected by the conflict, with damage to water infrastructure and the over-extraction of groundwater leading to water scarcity. The scarcity of clean water has become a major humanitarian concern, as it affects not only drinking water but also the ability to irrigate crops and sustain agriculture, further contributing to food insecurity and fragility in the country.¹¹⁴ Addressing these interconnected challenges requires a comprehensive approach, including conflict resolution, resource management, and humanitarian assistance, to mitigate the impact on Yemen's food, land, and water systems.

Yemen || Key Fragility, Conflict, and Migration Relevant Figures

	Governance Indicator	Global Hunger Index Score	Global Food Security Index Score	Agri as % of GDP	Arable Land	Water Stress	Population with a financial institution account	Internally displaced people
Note	Avg of all indicators - 2.5: lowest, +25: highest	<10: low alarming, 50+: extremely alarming	0: lowest, 100: highest, ranking out of 113 countries	Agri, fisheries, and forestry value-added	% of the total land	% withdrawn from total renewable source	% of population, age 15+	Number at the end of the year

¹¹¹ Carnegie Endowment for International Peace (2023), [“The economic recovery of Yemen”](#)

¹¹² FAO (2023), [“Supporting efficient water use for agrifood systems transformation in Yemen”](#)

¹¹³ Research Project on Land Governance in the Arab Region (2022), [“Land Problems and Disputes in Yemen”](#)

¹¹⁴ Center for Civilians in Conflict (2022), [“Risking the future: Climate change, environmental destruction, and conflict in Yemen”](#)

Figure	-2	45	40 (111th)	17%	2.2%	170%	No information	4.5M
Source	World Bank WorldWide Governance Indicator (2021)	Global Hunger Index (2022)	Economist Impact, Food Security Index	World Bank (2022)	FAO (2021)	FAO Aquastat (2020)	World Bank Global FinIndex Database 2021	Internal Displacement Monitoring Centre (2022)

FLWS Innovation ecosystem in the HDP nexus

Despite socioeconomic instabilities, Yemen's FLW innovation ecosystem is relatively larger than some other FCAS countries covered in this research. The mapping captured 30+ FLWS-HDP innovators operating in Yemen with food production and migration being the two largest categories. The innovations in the ecosystem lean closer to traditional agribusinesses than tech-enabled innovations. For example, the most prevalent food production innovations are in poultry production, fortified poultry feed and vaccines, followed by farming equipment innovators. Nevertheless, supply chain and last-mile delivery actors are also present in the ecosystem connecting food production and hard-to-reach customers. Financial inclusion is the most prevalent innovation when it comes to serving displaced individuals. Mobile money solutions, such as One Cash and Floosak e-wallet and Cash Wallet are developed and operated in Yemen, connecting Yemeni users to financial products outside of formal banks.

However, funding information on the Yemeni FLWS-HDP ecosystem remains limited. This is especially the case for FLWS-HDP innovators working in conflict-affected areas. For example, the food delivery service Tawseel has raised funding from UAE-based VC Numu Capital,¹¹⁵ but Tawseel only operates in selected cities. Additional funding and business assistance will need to be mobilised for innovators like Tawseel to adapt their services to deliver impact on underserved users and rural communities relevant to the HDP nexus.

¹¹⁵ Wamda (2023), "[Yemen's Tawseel raises investment from Numu Capital](#)"

Box 1: PROGRAMME SPOTLIGHT- [Mahda Water Project](#)

Background

The Mahda Water Project is a joint implementation programme between King Salman Humanitarian Aid and Relief Centre (KSrelief) and UNICEF to bring key water and sanitation solutions to conflict-affected communities in Yemen. Starting in 2022, the project installed solar-powered tower tanks that can provide safe and affordable water access to families and children in Al Safra district. Key partners in providing the technology and implementation were the Local Corporation for Water and Sanitation in the Sa'ada Governorate.

Business model

This project is funded by KSrelief and is used as an addition to the public water supply infrastructure. The solarised water sanitation infrastructure built in this project is more affordable for residents as it is less impacted by oil price shocks.

Impact

The project helped reduce the price of water for residents by 10 times less compared to the existing water supply. This project also helped separate water supplies for residential and agricultural uses. Increasing access to safe and affordable water sources also created more opportunities for children to return to school as they were able to spend less time carrying water from distant wells.

Scale and reach

The project was able to reach 2500 families. This project was implemented as a part of the [larger WASH programme between KSreleif and UNICEF](#) which also involved restoring water supply infrastructures in other governorates and providing better access to safe water to over 130,000 people.

Box 2: ENABLER SPOTLIGHT - [ORGANIC YEMEN](#)

Background

Organic Yemen was founded in 2012 and is a provider of industry insights and data on Yemeni agriculture and renewable energy sectors. Their objective is to lower investment risks and promote investment opportunities in these high-impact sectors by providing reliable data and insights from industry experts.

Impact

Organic Yemen is trying to create a longer-term impact by mobilising investments throughout the agricultural and renewable energy value chain. The company collects agriculture data and uses data analytics to provide early warning systems for weather shocks to investors and farmers. They also work with local agriculture research agencies for new crop research.

Scale and Reach

Organic Yemen has scaled by launching Yemeni products to regional markets (UAE) and creating in-house brands for processed agricultural products (honey and supplements). They also began partnering with agricultural institutes in Yemen to further their study capacity on new crop innovations.

Bangladesh | South Asia

Macroeconomic Context

Bangladesh, with a population of 171 million, demonstrates a moderate Human Development Index of 0.66, indicating a satisfactory standard of living and access to essential services. The Doing Business Score of 45 out of 100 reflects a somewhat challenging business environment. The country receives donor funding amounting to USD 644 million, supporting various developmental initiatives. Bangladesh currently holds no classification in the World Bank's Fragility, Conflict-Affected Situation country list, suggesting a relative absence of immediate fragility or conflict-related challenges in recent years. The nation continues to navigate economic development and social progress, with ongoing efforts to enhance business conditions and further improve human development indicators.

Bangladesh has experienced various conflicts rooted in historical, political, and socio-economic factors. The country's struggle for independence from Pakistan in 1971 marked a significant conflict, resulting in a war of liberation and the creation of the independent state of Bangladesh.¹¹⁶ Since then, political instability, governance challenges, and periodic episodes of violence have characterized the nation's landscape. Issues such as poverty, inequality, political polarization, and religious tensions have contributed to social unrest. Additionally, environmental challenges, including climate change impacts such as flooding and cyclones, have heightened vulnerabilities, leading to disputes over resources and potential conflicts.¹¹⁷ Ongoing efforts to address these multifaceted issues, promote inclusive development, and strengthen governance remain crucial for fostering stability and mitigating the risk of conflicts in Bangladesh.

¹¹⁶ Aljazeera (2019), "[Remembering the war of 1971 in East Pakistan](#)"

¹¹⁷ World Bank (2022), "[Urgent climate action crucial for Bangladesh to sustain strong growth](#)"

Bangladesh || Macroeconomic Country Overview

	Population	Human Development Index (HDI)	Doing Business Score	Donor Funding	World Bank List of FCAS
Figure	171M	0.66	45	\$644M	No classified as FCAS
Source	World Bank (2022)	UNDP (2021)	World Bank Doing Business Score (2020)	UN OCHA Financial Tracking Services (2022)	World Bank, FY24 FCAS List

FCA Context

Top FCA conditions impacting Bangladesh include political instability,¹¹⁸ tensions related to transboundary river management, and resource allocation between socio-ethnic groups, including the Rohingya refugees in Cox's Bazar highway region.¹¹⁹ These FCA factors add a burden to Bangladesh's existing vulnerabilities in FLW security. The country's densely populated and low-lying geography makes it particularly vulnerable to climate change, with rising sea levels posing a threat to agricultural land and freshwater resources. Frequent cyclones, floods, and riverbank erosion further exacerbate the risks to food security and land stability.¹²⁰ Limited arable land and a rapidly growing population put pressure on agricultural resources, potentially leading to conflicts over land use and access to water for irrigation.

In addition to environmental challenges, Bangladesh's water systems are intricately connected to transboundary rivers shared with neighbouring countries, adding a geopolitical dimension to water management.¹²¹ The potential for fragility and conflict is also influenced by socio-economic factors, including poverty, unequal distribution of resources, and governance issues. Addressing these interconnected challenges requires a comprehensive approach that considers both environmental sustainability and social equity to build resilience and reduce the risk of conflict related to food, land, and water systems in Bangladesh.

Bangladesh || Key Fragility, Conflict, and Migration Relevant Figures

	Governance Indicator	Global Hunger Index Score	Global Food Security Index Score	Agri as % of GDP	Arable Land	Water Stress	Population with a financial institution account	Internally displaced people
Note	Avg of all indicators - 2.5: lowest, +25: highest	<10: low alarming, 50+: extremely alarming	0: lowest, 100: highest, ranking out of 113 countries	Agri, fisheries, and forestry value-added	% of the total land	% withdrawn from total renewable source	% of population, age 15+	Number at the end of the year

¹¹⁸ The Diplomat (2023), "[Bangladesh reels under economic crisis and political unrest](#)"

¹¹⁹ UNHCR (2023), "[Rohingya Refugee Crisis Explained](#)"

¹²⁰ Ministry of Environment, Forest and Climate Change (2022), "[National Adaptation Plan of Bangladesh](#)"

¹²¹ European Foundation for South Asian Studies (2022), "[Transboundary river management in Bangladesh and India](#)"

Figure	-0.87	20	54 (80th)	12%	61%	6%	38%	427K
Source	World Bank WorldWide Governance Indicator (2021)	Global Hunger Index (2022)	Economist Impact, Food Security Index	World Bank (2022)	FAO (2021)	FAO Aquastat (2020)	World Bank Global Findex Database 2021	Internal Displacement Monitoring Centre (2022)

FLWS innovation ecosystem in the HDP nexus

Bangladesh has a relatively active and developed FLWS-HDP ecosystem, with 90+ innovators captured in the data. Food production is the largest category of innovation, and solutions providing market linkages such as marketplace for agricultural produce, grocery delivery, food delivery, and supply chain management dominate the space. Companies producing inputs and on-farm services in the seeds, livestock, and poultry sectors make up the food production category. Land management solutions in Bangladesh are mostly in waste management with a relatively higher number of innovators in e-waste solutions. While water resource management is a big contributing factor to Bangladesh's political and food instability, private sector solutions captured in the water management category seem to play a role at the consumer level rather than at a macro level by providing better access to water in rural areas, helping households manage their water usage, and treating household wastewater.

Investment trends show that private sector engagement in the FLWS-HDP ecosystem is growing. Even though many of the deals are still at an early stage, over half of the total deals captured in the data (n=22) have a ticket size of over \$100K. An area of food-related innovation that is particularly receiving a lot of investor attention is in food delivery, Food and grocery delivery innovations saw a jump in investor interest in 2021, presumably due to the impact of COVID-19. Grocery delivery service Chaldal raised \$10M series-C funding from a consortium of international investors and food delivery service HungryNaki was acquired by China's Alibaba. This demonstrates that innovations using marketplace solutions can be well suited to scale in more highly populated areas through private sector participation.

Box 1: INNOVATOR SPOTLIGHT - [CHALDAL](#)

Background

Chaldal is a grocery delivery solution operating across three major cities in Bangladesh. From 2013, Chaldal has become one of the largest e-commerce platforms in Bangladesh by consolidating and formalising Bangladesh's fragmented supply chain.

Business model

Chaldal uses a platform-and-delivery model. First, grocery and household goods sellers post their products on Chaldal's platform where consumers shop and Chaldal delivers the purchased goods to the consumers. They were able to reach scale by creating an end-to-end platform that optimises the logistics and fulfilment planning. Chaldal uses micro-warehouses and has an in-house delivery system to efficiently store and deliver purchased goods.

Impact

Their in-house delivery creates more stable employment for the delivery workers. Also, developing their own warehousing infrastructure helps consolidate the fragmented supply chain system.

Scale and reach

By 2019, Chaldal has reached over 50,000 households and 200 business customers subscribed to the service. Chaldal processes over 2,000 orders a day. Chaldal has 27 warehouses across four cities and they plan to expand a service called GoGo Bangla that will provide an on-demand logistics service for small e-commerce businesses and a wholesale platform called Chaldal Vegetable Network.

Box 2: PROGRAMME SPOTLIGHT - [BANGLADESH AGRO-METEOROLOGICAL INFORMATION SYSTEM \(BAMIS\)](#)

Background

BAMIS is developed by the Bangladeshi Ministry of Agriculture to deliver weather, water, and climate information services. BAMIS aims to increase agricultural productivity and to help farmers cope with climate and weather shocks.

Business model

BAMIS developed agro-meteorological services geared towards reaching farmers by bringing together meteorologists and agriculturists. BAMIS also developed a comprehensive web portal integrated with Amazing Weather Station where historical and up-to-date weather and agricultural data are digitised and stored.

Impact

BAMIS provides weekly data on multiple agro-meteorological data on the portal across 64 districts in Bangladesh. BAMIS along with the Department of Agricultural Extension and Agriculture Information Service can provide early warning systems.

Scale and reach

BAMIS covers 64 districts in Bangladesh and has onboarded 30,000 lead farmers who serve as the first information dissemination points from the Agromet Technical Committee.

Pakistan | South Asia

Macroeconomic Context

Pakistan, a large South Asian country home to 236 million people, demonstrates a lower or moderate Human Development Index of 0.54, indicating room to improve the standard of living and access to essential services. Despite the country facing challenges such as fiscal deficits, external debt, and inflation, the Doing Business Score of 61 out of 100 reflects a relatively enabling business environment. The country receives donor funding amounting to USD 542 million, which amounts to 0.1% of its GDP that year. Pakistan has received support from international financial institutions to address economic imbalances and structural reforms.¹²² Pakistan currently holds no classification in the World Bank's Fragility, Conflict-Affected Situation country list, suggesting a relative absence of immediate fragility or conflict-related challenges in recent years. However, the country continues to grapple with issues like political instability, security concerns, and energy shortages, which can impact overall economic performance.

Pakistan | | Macroeconomic Country Overview

Population	Human Development Index (HDI)	Doing Business Score	Donor Funding	World Bank List of FCAS
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¹²² International Monetary Fund (2023), "[IMF executive board approves US\\$3 billion stand-by arrangement for Pakistan](#)"

Figure	236M	0.54	61	\$542M	Not classified as FCAS
Source	World Bank (2022)	UNDP (2021)	World Bank Doing Business Score (2020)	UN OCHA Financial Tracking Services (2022)	World Bank, FY24 FCAS List

FCA Context

Pakistan faces challenges related to fragility and conflict that impact various aspects of its socio-economic landscape. The country has experienced internal conflicts and security concerns, particularly in regions bordering Afghanistan.¹²³ These conflicts have strained governance structures, hindered economic development, and contributed to displacement and humanitarian challenges. Additionally, the longstanding geopolitical tensions with India over the Kashmir region add another layer of complexity.¹²⁴ The security situation has implications for investor confidence, economic stability, and social well-being. While Pakistan has made efforts to address these challenges through counter-terrorism measures and regional diplomacy, the persistent fragility and conflict dynamics continue to influence the country's overall development trajectory. Ongoing monitoring and strategic approaches are crucial to mitigating the impact of fragility and conflict on Pakistan's socio-economic stability.

Pakistan | Key Fragility, Conflict, and Migration Relevant Figures

	Governance Indicator	Global Hunger Index Score	Global Food Security Index Score	Agri as % of GDP	Arable Land	Water Stress	Population with a financial institution account	Internally displaced people
Note	Avg of all indicators - 2.5: lowest, +25: highest	<10: low alarming, 50+: extremely alarming	0: lowest, 100: highest, ranking out of 113 countries	Agri, fisheries, and forestry value-added	% of the total land	% withdrawn from total renewable source	% of population, age 15+	Number at the end of the year
Figure	-0.96	26	52 (84th)	23%	40%	116%	16%	21K
Source	World Bank WorldWide Governance Indicator (2021)	Global Hunger Index (2022)	Economist Impact, Food Security Index	World Bank (2022)	FAO (2021)	FAO Aquastat (2020)	World Bank Global Findex Database 2021	Internal Displacement Monitoring Centre (2022)

FLWS Innovation ecosystem in the HDP Nexus

Pakistan has one of the largest FLWS-HDP innovation ecosystems when compared with the rest of the FCAS countries in the study. There are 135+ companies captured in the data, with the vast majority of them in the food production category, followed by the water resource management category. Amongst food production innovations, three main types of services are prominent: market linkage solutions, on-farm innovation, and digitalised agribusinesses. Market linkage solutions that connect producers, supply chain actors, and sellers via platforms make up a large proportion of food production innovations. Innovative farming solutions such as precision agriculture, vertical farming, and farm management through drones are the key innovations in Pakistani agriculture. Lastly, agribusinesses in livestock and dairy farming segments are visible in the innovation ecosystem.

¹²³ Center for Preventive Action (2023), "[Instability in Pakistan](#)"

¹²⁴ Center for Preventive Action (2023), "[Conflict between India and Pakistan](#)"

The investment trends show that food production is attracting a lot of investor interest. All of the deals over \$1M in ticket size are food production companies raising between seed and pre-series A stage deals. There is a spike in investments in 2021 as food delivery companies raised big-ticket deals during the times. On the other hand, the smaller ticket size deals are spread across the five innovation categories, signalling that there are a sizeable number of early-stage innovations emerging across the different areas of the FLWS-HDP ecosystem.

Box 1: INNOVATOR SPOTLIGHT- [Rahat.io](https://rahat.io)

Background

Rahat is a financial access platform for vulnerable communities. Rahat is based in Nepal but operates in Pakistan as well. Their innovations use open-source blockchain technologies to provide financial products for target users.

Business model

Rahat's primary consumers seem to be governments and humanitarian support organisations. Rahat offers three solutions (1) cash and voucher assistance (2) micro-insurance through weather data (3) smart contract using hydrological data for anticipatory action alerts.

Impact

Rahat has created solutions that improve the implementation of humanitarian aid distribution efforts. Their solutions are designed with climate resilience and improving underserved populations in mind. Their solutions are targeted to serve marginalised communities including those in weather disaster zones, underserved youth, smallholder farmers, daily wagers, and migrant labour workers.

Scale and reach

Rahat has reached over 16,000 beneficiaries across 21 local communities in Nepal and Pakistan.

Box 2: INNOVATOR SPOTLIGHT - [PAKVITAE](#)

Background

Pakvitae is a Karachi-based developer of Water Ka Doctor water filters that removes 99.9% of harmful bacteria & parasites from water sources (excluding salt or brackish water) using Esoteric Resistive Membrane (ERM) technology. Water Ka Doctor can filter up to 60 L per hour without electricity.

Business Model

Water Ka Doctor is priced at Rs6,500 and has a lifespan of 2 years. Water Ka Doctors are sold to individual users as well as government or humanitarian support organisations. They provide Water Ka Doctor at a subsidised price for flood victims in Pakistan.

Impact

Pakvitae's solution provides low-energy and long-lasting water filtration to households who otherwise may not have access to clean water. Pakvitae has also provided over 15,000 water purifiers to flood-affected people across Pakistan.

Scale and Reach

Pakvitae has benefited over 300,000 individuals through their water purifiers.

Sri Lanka | South Asia

Macroeconomic Context

Sri Lanka is an island located in South Asia, with a population of approximately 22 million. Sri Lanka has achieved a relatively high Human Development Index of 0.78, indicating a good overall standard of living and access to essential services. The country's Doing Business Score of 61.8 out of 100 suggests a moderately conducive business environment. Sri Lanka receives donor funding amounting to \$167 million for various development initiatives. Sri Lanka has seen large macroeconomic shocks in recent years and grappled with high levels of public debt, fiscal deficits, and a strained external balance. The country has sought assistance from international financial institutions to address its balance of payments issues.¹²⁵ Additionally, political and policy uncertainties have contributed to economic challenges, affecting investor confidence.¹²⁶

Sri Lanka || Macroeconomic Country Overview

Population	Human Development Index (HDI)	Doing Business Score	Donor Funding	World Bank List of FCAS
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¹²⁵ World Bank (2023), "[Sri Lanka: How to Strengthen Debt Management at the Time of Uncertainty](#)"

¹²⁶ CEIC (2023), "[Sri Lanka Business Confidence Growth](#)"

Figure	22M	0.78	62	\$167M	Not classified as FCAS
Source	World Bank (2022)	UNDP (2021)	World Bank Doing Business Score (2020)	UN OCHA Financial Tracking Services (2022)	World Bank, FY24 FCAS List

FCA Context

While Sri Lanka's civil war ended in 2009, the humanitarian situation has been volatile for many years. More than 70 thousand people were reported to have been killed during the period, with many severe human rights violations reported,¹²⁷ and almost 800 thousand displaced. Civil tensions continue to this day, and a large portion of the Tamil population remains displaced. This has heightened challenges in the economy, with poverty rates estimated to remain above 25% in the foreseeable future.¹²⁸ At the end of 2022, almost ⅓ of the population was facing acute food insecurity.¹²⁹ A recent report released by FAO and WFP indicates that the situation is improving, partially attributed to better consumption and reduced food prices, though certain districts continue to struggle. Several of these regions rely on assistance programmes as a source of income.¹³⁰

Sri Lanka's food, land, and water systems face specific challenges within the context of past conflicts and fragility. While the country has made substantial progress in terms of food security and agricultural development, the legacy of a protracted civil conflict has left certain areas with lingering landmine issues,¹³¹ hampering agricultural utilisation and affecting land resources.¹³² Additionally, post-conflict resettlement efforts have created challenges related to land disputes and property rights.¹³³ Despite these challenges, Sri Lanka benefits from a relatively stable food and water supply system, with ongoing government efforts to address post-conflict land and property issues to support reconciliation and sustainable agricultural development.¹³⁴

Sri Lanka || Key Fragility, Conflict, and Migration Relevant Figures

	Governance Indicator	Global Hunger Index Score	Global Food Security Index Score	Agri as % of GDP	Arable Land	Water Stress	Population with a financial institution account	Internally displaced people
Note	Avg of all indicators - 2.5: lowest, +25: highest	<10: low alarming, 50+: extremely alarming	0: lowest, 100: highest, ranking out of 113 countries	Agri, fisheries, and forestry value-added	% of the total land	% withdrawn from total renewable source	% of population, age 15+	Number at the end of the year

¹²⁷ Nithyani Anandakugan (2020), "[The Sri Lankan Civil War and Its History, Revisited in 2020](#)"

¹²⁸ World Bank (2023), "[Sri Lanka](#)"

¹²⁹ ReliefWeb (2023), "[Sri Lanka: Food Security Crisis - 2022-2023](#)"

¹³⁰ WFP (2023), "[Food insecurity improves in Sri Lanka but prevails within specific regions](#)"

¹³¹ The Halo Trust (2023), "[20 Years, 6,700 Cricket Pitches And 270,000 Mines](#)"

¹³² WFP (2023), "[Bangladesh: Food Security Monitoring January 2023 - Remote Household Food Security Survey Brief](#)"

¹³³ Oxfam Research Reports (2020), "[Securing Land Rights Of Displaced And Evicted Communities In Northern And Eastern Sri Lanka](#)"

¹³⁴ ADB (2001-2022), "[Rebuilding Lives: ADB's Assistance to Former Conflict-affected Areas in Sri Lanka \(2001 - 2022\)](#)"

Figure	-0.41	14	55 (79th)	9%	22%	91%	89%	12K
Source	World Bank WorldWide Governance Indicator (2021)	Global Hunger Index (2022)	Economist Impact, Food Security Index	World Bank (2022)	FAO (2021)	FAO Aquastat (2020)	World Bank Global Findex Database 2021	Internal Displacement Monitoring Centre (2022)

FLWS Innovation Ecosystem in the HDP Nexus

The Sri Lankan FLWS-HDP innovation ecosystem has been steadily developing in the last two decades. The data indicates almost 40 FLWS-HDP innovators operating in Sri Lanka with food production and land management categories being the prominent areas of innovation. The ecosystem showcases tech-enabled food production innovations such as precision agriculture, vertical farming, farm management tech, and hydroponics. Land management innovations are mostly around waste recycling and environmental protection, but little information is available so far on private sector innovations in conflict-related areas such as land dispute management or landmine removal.

While the ecosystem has been developing, investments into the FLWS-HDP ecosystem remain early stage and less visible. While most of the companies identified lack funding information, there are some examples. Last-mile logistics solution Grasshopper has raised funds through Aavishkaar Frontier Fund¹³⁵ and smart agronomy solution Elzian Agro recently won a grant from a Dubai ExpoLive Innovation Programme challenge¹³⁶. The small number of deals does not necessarily mean investor interest is lacking in the innovation ecosystem as a whole, but rather that the FLWS-HDP innovations may not be getting as much attention from venture space investors as other sectors like fintech and e-commerce¹³⁷, and could instead be securing funding from sources like banks or microfinance institutions that do not disclose funding information publicly.

¹³⁵ Daily FT (2019), "[Lankan logistics trailblazer 'Grasshoppers' wins second investment from Aavishkaar](#)"

¹³⁶ BusinessCafe (2023), "[ELZIAN AGRO Secures Innovation Grant in Expo Live Innovation Programme](#)"

¹³⁷ Lankan Angel Network's previously funded companies are mostly in fintech and e-commerce, "[Lankan Angel Network's previously funded companies](#)"

Box 1: ENABLER PROGRAMME SPOTLIGHT- [Good Life x](#)

Background

Good Life x is an innovation hub offering incubation and acceleration programmes focused on FLWS-HDP innovation and sustainability. Good Life x works with early and post-revenue startups as well as traditional sector SMEs to build sustainable business models and

investment readiness. Relevant programmes include their “Road to Regen Accelerator Program”, which works with small-scale agribusinesses to adopt innovation and regeneration principles.

Impact

Good Life x has become a hub for the Sri Lankan innovation ecosystem and has embedded the importance of regenerative and circular innovation. Good Life x partners with public and private institutions to create venture-building and venture-supporting programmes. Good Life x works across different private sector value chains, from seed-stage startups to SMEs and corporates.

Scale and reach

The Good Life X has conducted over 7000 hours of collaboration between experts and local entrepreneurs and mobilised over 52M LKR seed funding by service or product purchases.

Box 2: GOVERNMENT INITIATIVE SPOTLIGHT - [Smallholder Agribusiness Partnership Programme \(SAPP\)](#)

Background

SAPP is an implementation organisation of the Sri Lankan Ministry of Agriculture that enables commercial partnerships between smallholder farmers and commercial actors. They do so by providing technical training on innovative farming methods and financial literacy. SAPP also supports [youth innovators](#) in the agriculture sector to become entrepreneurs by providing training on innovative farming methods and business advisory services. SAPP provides seed-stage funding for entrepreneurs averaging between \$1000 to credit facilities up to \$2M LKR to enable budding entrepreneurs to take their ideas to the next stage.

Impact

SAPP’s impact rests on its ability to implement and connect innovative farming methods to smallholder farmers. SAPP focuses on public-private producer partnerships to create market linkages between smallholder farmers and commercial activities, as well as rural youth farmer capacity development to equip youth smallholder farmers with more resilient tools for the future.

Scale and reach

SAPP has 5 regional offices across Sri Lanka and has a SAPP has involved over 2500 young entrepreneurs in their youth projects.

Actor Type	Name	Foundation year	HQ Country	Operational country	Product	FLW-HDP Category	Activity type	Deal (Date, Size, Type)	Info
Innovators	✓	✓	✓	✓	✓	✓		✓	
Funding partner	✓		✓	✓			✓		
Government initiative	✓		✓				✓		
Development/humanitarian organisation	✓		✓	✓			✓		
Corporates	✓		✓			✓	✓		
Entrepreneur support organisation	✓		✓	✓			✓		

Annexe

Datapoints by Actor Type¹³⁸

The research scope includes mapping different actors that play a role in the FLWS-HDP innovation ecosystem in FCAS contexts. The report draws from its proprietary database Briter Intelligence to gather up-to-date information on each actor type. This information is used to categorise and analyse each actor type's profile and their involvement in the innovation ecosystem. See the below table for an overview of data points collected for each of the actor types.

Typology of Key Data Points

The below table explains the typology of selected key data points that are crucial in scoping and analysing the relevant actors contributing to the FLWS-HDP ecosystem. Note that the research excludes some actor typology variables such as business and organisational model and organisational size due to the lack of consistent data availability across different actor types.

¹³⁸ Briter Intelligence only uses publicly available information for each of the actor types. This means that data points covered have varying degrees of missing information. For example, deal type and deal size information are often undisclosed while foundation year have less missing data points.

Data Point Typology

Actor Type	Innovator, Funding Partner, Government Initiative, Development/ Humanitarian organisation, Corporates, Entrepreneur Support Organisations, Collaborative Ecosystem Enablers
Activity Type	Acceleration/Incubation, Business support & technical assistance, Policy, Infrastructure enabler, Governance & Policy Advocacy, Funds, Donor & Emergency Relief, Capacity Building for Farmers
Foundation Year	Year company was founded.
HQ Country	Country where the actor is incorporated.
Operational Country	Listed to include actors that are operationally active in one of the selected countries,
FLW-HDP category	Area of FLW-HDP ecosystem in which the actor operates: Food, Land, Water, Migration, and Anticipatory Action for Land and Other Crisis Management
Deal info	Deal stage, size, and date information of the funding received or deployed.

Solution Taxonomy¹³⁹

The scope of the FLWS-HDP innovators are innovators that offer solutions relevant to FLWS and HDP nexus. Below is a table of solutions identified as relevant to understanding the FLWS and HDP. Solutions that were researched under the solution taxonomy but did not find any innovators offering the solution in the 14 FCA countries are listed in the footnote.¹⁴⁰

Category	Solutions
Food	Aeroponics, Agro-Processing, Animal Care, Animal Feed, Animal Health, Apiculture, Aquaculture, Bio Material, Biodigesters, Coffee and Tea, Cold Chain, Cold Storage, Commodity Exchange, Contract Farming, Cooking, Crop Insurance, Crop Nutrition, Crowdfunding*, Dairy, Domestic Farming, Energy*, Farm Management, Farming Equipment, Fertilisers and Inputs, Fish, Fish Farming, Food Delivery, Food Production, FoodTech, Gas & Cooking Equipment, Groceries Delivery, Health & Natural Foods, Healthy Beverages, Hydroponics, Last Mile Delivery*, Livestock, Market Access*, Market Information*, Market Linkages*, Market Research*, Marketplace for Agricultural Inputs, Marketplace for Agricultural Produce, Pest Detection, Poultry, Precision Agriculture, Seeds, Snacks, Solar Energy*, Solar Products*, Supply Chain Management*, Tractors, Urban Farming, Vertical Farming
Land	Environmental Protection, Forestry, Household Waste, Organic Waste, Permaculture, Soil

¹³⁹ * indicates these products are not always working in the FLWS-HDP ecosystem and hence analysed at a firm-level to ensure relevance to FLWS-HDP areas.

¹⁴⁰ Addressing Systems, Anti-Poaching, Blockchain* CleanTech*, E-pharmacy*, Fecal Sludge Management (FSM), Field Management, Hydrogeology, Hydropower, Land Titling, Local Producers, Logistics Management*, MigrantTech, Protein, Sheltertech, Solar Home Kit*, Wildlife Conservation

Testing, Waste Disposal, Waste Management, Waste Recycling, E-waste	
Water	Irrigation, WASH (Water, Sanitation, and Hygiene), Waste Water, Water Access
Migration	Drones*, Identity*, KYC*, RefugeeTech, Financial Inclusion for Migrants, Sustainable housing, Electronic Medical Records (EMR)*, E-wallet*
Anticipatory Action for Land and Other Crisis Management	Air Filtration, Biofuels*, Carbon, Civictech- case by case, Crisis management support, Early warning system, Emergency Services, search dedicated to this, Weather Forecast

Actor Taxonomy

Below table explains the scope and the definitions of the actors identified in this research. These actors are identified through funding data and additional desk research.

Actor	Definition
Innovator	Tech-enabled and digitally-focused startups involved in the FLWS-HDP ecosystem. Traditional businesses that are not tech-enabled or tech-focused are likely outside the scope of this actor type but some may be included if they work closely to enable or distribute another startup's solution.
Investor	Institutional (banks), non-institutional equity (VC, PE, Foundations) investors that are funding innovators.
Government	Public grants and financial support arms across city, regional, and national levels.
Non-Governmental Organisations (NGO)	Humanitarian and relief organisations providing financial support for FLW startups. This includes development finance institutes.
Corporates	Older and more established companies who are investing in and becoming distribution partners of FLW innovations.
Entrepreneurial Support Organisations (ESO)	Hubs, incubators, accelerators, venture builders etc who are providing early stage support for FLW innovators.

Collaborative Ecosystem Enablers	Organisations and entities that actively promote and facilitate collaboration between tech startups and traditional businesses within the ecosystem. These entities help bridge the gap between innovation-driven startups and established players.
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Below table demonstrates an example of actors by actor types

Actor	Description
Innovator	
AgriSense	AgriSense is a Pakistani company that collects real-time agricultural activity data and packages the data for input providers, agri-distribution, finance industry and for economic planning.
Bfarm-Tech	Bfarm-Tech is a peer-to-peer agricultural machinery renting service for smallholder farmers in Ethiopia.
Mbeu Yedu	Mbeu Yedu is a Zimbabwean agri-fintech solution provider that develops a digital community seed bank service for smallholder and rural farmers to view biodiversity registry, borrow/return/swap seeds.
Investor	
Fund for Rural Prosperity I by Mastercard	This fund is designed to harness the creativity and capacity of the financial sector and for-profit businesses to innovate, increase access to and deliver financial services at scale.
African Agriculture Fund by Phatisa	The African Agriculture Fund is a private equity fund managed by Phatisa, focused on enhancing food security in Africa. Phatisa specialises in investments across the African food value chain and affordable housing.
Lending for African Farming (LAFco)	LAFco provides loans to agricultural SMEs throughout sub-Saharan Africa that work directly with smallholder farmers, with a primary focus on businesses that advance local and regional food security. LAFco endeavors to serve the day-to-day working capital needs of agricultural businesses, particularly those operating in staple food crop value chains.
Government	
Ethiopian Agricultural Transformation Agency (ATA)	The ATA is a strategy and delivery oriented government agency created to help accelerate the growth and transformation of Ethiopia's agriculture sector. The Agency's mandate is focused solely on improving the livelihoods of smallholder farmers across the country.
Lagos State Science Research and Innovation Council (LASRIC)	The Lagos State Science Research and Innovation Council (LASRIC) is a council with a mission to empower research and innovation initiatives by supporting through funding and network access.
Non-Governmental Organisation (NGO)	
Bestseller Foundation	Bestseller foundation is a private foundation that invests in businesses with positive social and environmental impact. They focus on providing early stage capital for circular economy ventures in Sub-Saharan Africa.
Algorand Foundation	Algorand Foundation supports scaling of blockchain technology with the aim of creating a borderless global ecosystem.
Corporates	
Promasidor Limited	Promasidor Nigeria Limited is a consumer packaged goods company headquartered in Isolo, Lagos. It has invested in Zowasel, a marketplace for agricultural produce.

United Pakistan Limited	Distributors	United Distributors Pakistan Limited (UDPL) is a corporate with principal business activities in manufacturing, trading and distribution of pesticides, fertilisers and other allied products . It has invested in Farmdar.
Entrepreneurial Support Organisation (ESO)		
Acumen (Accelerator for Ventures Serving Displaced People)	Academy Displaced	The Acumen Academy's Accelerator for Ventures Serving Displaced People is a program designed to support enterprises that work towards advancing sustainable livelihoods for forcibly displaced populations in Uganda and Ethiopia. This program focuses on refining and developing scalable business models that can benefit these populations.
Migrants Programme (by Vilcap)	Acceleration	The Migrants Acceleration Programme, facilitated by Village Capital, is a significant initiative aimed at addressing financial inclusion challenges faced by migrants, particularly women, across Africa, the Middle East, and South Asia.
Collaborative Ecosystem Enabler		
Pitch AgriHack		The Pitch AgriHack is an initiative aimed at promoting and supporting innovations and startups in the agricultural sector, particularly in Africa, the Caribbean, and the Pacific regions, typically involving a series of activities designed to identify, nurture, and showcase innovative ICT solutions and businesses that address key challenges in agriculture and agribusiness.
GoGettaz Prize	Agripreneur	The GoGettaz Agripreneur Prize is a prestigious competition and award programme designed to recognise and support young entrepreneurs, specifically those involved in the agricultural sector in Africa. The prize aims to identify and celebrate innovative and promising agribusiness ventures while providing financial support and mentorship to help these entrepreneurs scale and succeed in their endeavours.

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