CIRCULAR FOOD SYSTEM BUSINESS CASE STUDIES FROM EAST AND SOUTHERN AFRICA

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Circular food system business case studies from East and Southern Africa

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Circular Food Systems in Africa (CFS) Project

The Circular Food Systems in Africa (CFS) project (2023–26) addresses the critical challenge of nourishing a growing population within planetary boundaries. Operating across Tanzania, Zimbabwe, South Africa, and Mozambique, the initiative transitions from traditional "take-make-waste" models toward a circular economy. By integrating irrigation, livestock, and dryland farming, the project optimises water, carbon, and nutrient cycles to decouple economic growth from resource depletion.
The research transforms smallholder farming communities into resilient, profitable ecosystems through four key areas:

- Socio-Economic Development: Supporting small businesses that add value to produce and repurpose agricultural by-products.
- Social Inclusion: Prioritising Gender, Youth, and Social Inclusion (GYSI) to empower underserved groups with leadership and economic agency.
- Environmental Sustainability: Implementing low-emission practices that enhance soil health and carbon sequestration.
- Policy and Scaling: Developing a robust evidence base to facilitate the regional adoption of circular models.

The project is a collaborative effort involving ANU, ARU, UEM, INIR, ICRISAT and FANRPAN.

Acknowledgments

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Acronyms and abbreviations

ACDI/VOCA	Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance
ACIAR	Australian Centre for International Agricultural Research
AIP	Agriculture Innovation Platform
ANU	Australian National University
ARU	Ardhi University
BSF-	Black Soldier Fly
CFS	Circular Food System
FANRPAN	Food, Agriculture and Natural Resources Policy Analysis Network
GPS	Global Positioning System
GYSI	Gender, Youth, and Social Inclusion
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IIAM	Instituto de Investigação Agrária de Moçambique
INIR	Instituto Nacional de Irrigação / National Institute for Irrigation
ISALS	Income Savings and Lending Schemes
MSMEs	Micro Small to Medium Enterprises
MT/MZN	Mozambican metical
NGO	Non-Governmental Organisations
PBC	Private Business Cooperation
SDAE	Serviço Distrital de Actividades Económicas
SME	Small to Medium Enterprises
TISA	Transforming Irrigation in Southern Africa project
ToT	Training of Trainers
Tsh	Tanzania Shilling
UEM	Universidade Eduardo Mondlane
USD	US dollar

Executive summary

Project Context

In recent time, circularity and agroecology have gained significant prominence, so one could ask, why is that the case? Over the last 50 years or so, concerns have increased over the impact of large-scale industrial farming and associated agribusinesses as they have: i) caused corporate concentration of power across multiple levels and long supply chains that marginalise smallholders; ii) monopolised access to resources, which has negatively impacted livelihoods, food security and ecosystems; iii) failed to invest in infrastructure and institutions to support domestic production and inclusive economic development and job creation, particularly in the Global South; iv) caused productivity and profitability to either not develop or stagnate among smallholders; and v) increased consumption of less nutritious and more processed food, which are rich in calories, fat, sugar and salt and have resulted in malnutrition and obesity and created a burden on government's health and social budgets.

Hence, there is an urgent need for an alternative agricultural production system. Circularity and agroecology offer such an alternative. Circularity tightens resource cycles through local reuse and recycling of nutrients, water and energy, and advocates for short, localised supply chains. Agroecology improves resource efficiencies and system resilience, but also emphasises socio-economic elements such as economic diversification, participation, connectivity, and social equity. In the context of food production, the two concepts support the emergence of a circular food system, which encourages using a combination of approaches and includes the integration of irrigated and rainfed cropping with livestock production, reuse of by-products, and local value-adding. Waste products are viewed as valuable by-products, which can be processed into organic fertilizers and composts with many benefits: improve soil fertility, reduce the use of water and expensive petrochemical inputs, and ensure that products exported from the community have the highest possible value. Overall, the approach decouples resource use from economic benefits by increasing outputs per unit of water, land and labour, while reversing soil degradation processes. Importantly, the approach provides food security, jobs and business opportunities, which promotes economic development and encourages local youth to remain in their communities.

Implementation overview and key findings

This report provides insight into how this approach can be implemented based on early learning from the Circular Food System in Africa (CFS) project funded by the Australian Centre for International Agricultural Research (ACIAR). The hypothesis underpinning the CFS project was, that the forerunner TISA project (Transforming Irrigation in Southern Africa, also funded by ACIAR) transformed

dysfunctional smallholder irrigation schemes to functional schemes by improving farmers' profitability; hence, the schemes and their farmers could become the economic engine for their local economy, supporting the integration of irrigation with surrounding rainfed and livestock producers and value adding businesses within their communities. The CFS project had two main interventions using inclusive innovation processes and working with: i) entrepreneurs to establish small businesses to adopt circularity practices, identify by-products and add value to local farm outputs (conceptually illustrated in Figure 1); and ii) lead farmers to spearhead the introduction of selected scale- and context-appropriate agroecological farming practices. This report focuses on the progress of establishing the small businesses. A forthcoming report will focus on the lead farmers. In combination the two reports will provide the foundation for an overall assessment of the extent to which the CFS project is moving communities toward circular food systems.

The report is based on twelve case studies and summary information on more than 50 small businesses emerging in Zimbabwe, Tanzania and Mozambique. The aim was to lower costs, create jobs and improve profits for businesses and livelihoods within communities by fostering a sustainable local circular food system. Agricultural Innovation Platforms (AIPs) were used to co-design implementation by identifying and selecting businesses and opportunities that would be viable in the local context. The CFS project supported the establishment and or expansion of these businesses through AIP-initiated training in business planning, record keeping, business registration, financial literacy, by-product valorisation and ongoing mentoring. Networking activities, including participation in expos, trade fairs, and business-to-business learning platforms, connected entrepreneurs with finance institutions, banks and markets, strengthening collaboration, innovation, and knowledge exchange among the value chain actors.

Significant efforts were made to develop finance options for new businesses by establishing contact with finance institutions, and training farmers in the lengthy processes of developing business plans, business registration, setting up bank accounts and establishing a track record of being operational, backed by money deposits in their accounts. However, combined with the short-term and rigid repayment schedules and high cost of current loan options, entrepreneurs are reluctant to take on these loans due to the risk and serious consequences of non-compliance. Across the countries, existing and new businesses were selected to receive focussed support and have been financed by a range of sources (see Key Lesson 4). In Tanzania, the AIP-initiated co-design process focused on identified new business opportunities for groups of farmers/entrepreneurs. Hence, the Tanzania section of this report highlights the complex and lengthy process of establishing new businesses from scratch and illustrates the challenges they faced, and how they adapted and are persevering in establishing their vision (Figure 12, 13; Table 3, 4). Whereas, the Zimbabwe and Mozambique teams elected, with the very short project

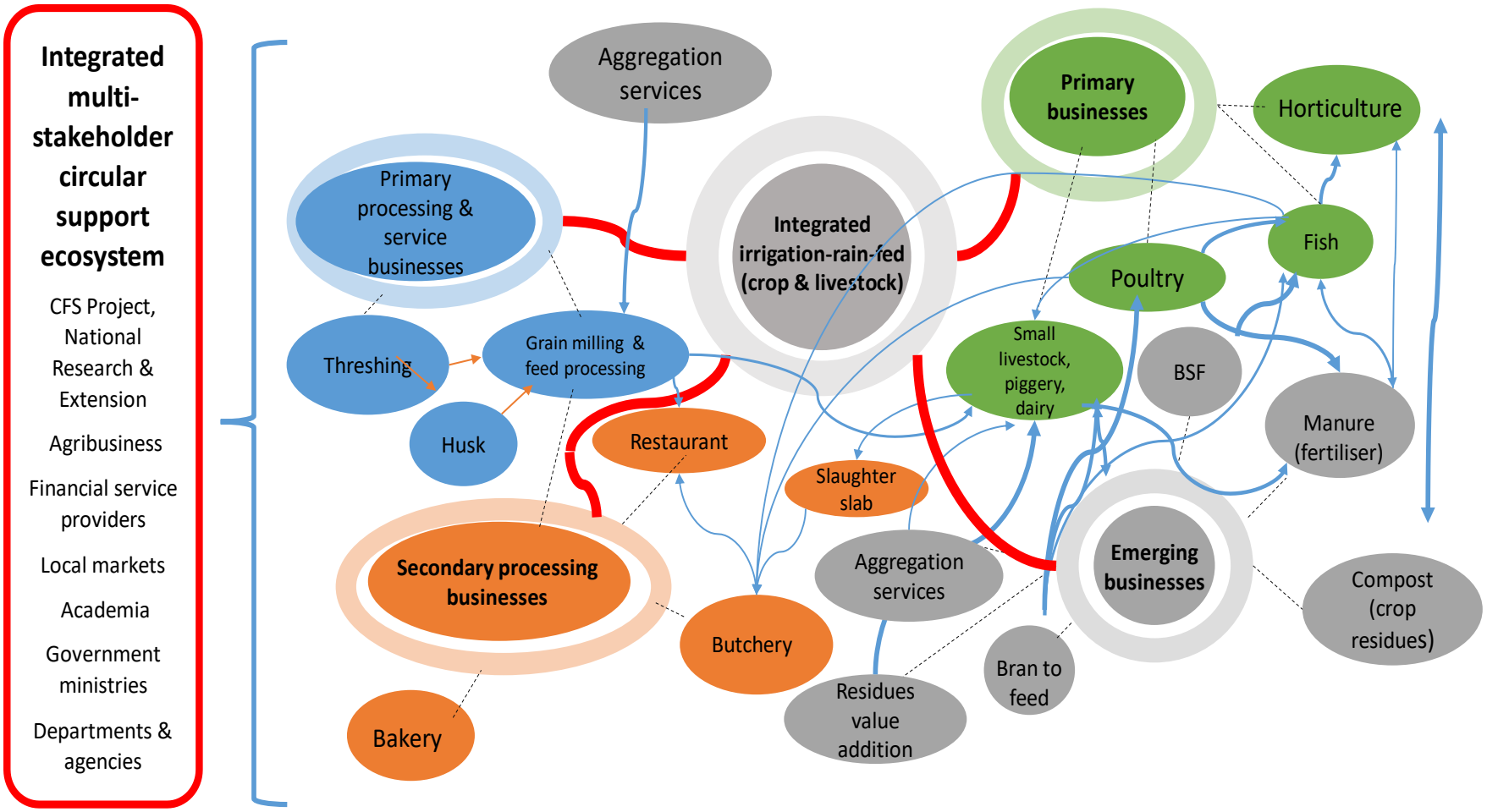

Figure 1: Strengthening Local Ecosystems- circularity across existing and emerging small businesses

timeframe and AIP-initiated co-design process, to focus on assisting existing farm businesses. In Zimbabwe in particular, several new businesses emerged, often with elements of circularity, during the final stages of TISA funded by the improved profitability realised through the project. Hence, many of the businesses engaged in the CFS project were existing self-funded businesses, which the project has supported to add on new business components or enhance circularity of existing business components. All country approaches provide lessons on stimulating CFS businesses.

This case study report shows clear evidence of a rich development of elements of local circularity (Figures 5, 14, 18; Tables 1 to 6). However, the circularity reflected in the country-specific diagrams (Figures 5, 14, 18) sometimes reflects businesses with 'internal' circularity or businesses that are figuratively, but not yet literally, connected into a local CFS in terms of selling or buying inputs and outputs to or from other local businesses and consumers. Significant potential lies within the communities as ideas and opportunities are already spreading; however, project timeframes necessitated co-selection of businesses that the community considered were a priority to build a locally relevant CFS and that were most likely to succeed in the short-term. There is scope for further research to establish and analyse the extent of direct circular connections within the local communities.

Key Lessons for business development

Our conclusion is that developing new value adding, non-farm-based small businesses, that require financial investment from formal lending sources, is unrealistic within a timeframe of less than two years. Rather, CFS initiatives can leverage off local entrepreneurs who are already engaged with or open to circularity opportunities alongside strategically developing key circularity links where demand is demonstrated and/or sectors of a community that need an extra hand to be included. Hence, we believe that establishing CFS businesses is part of a three-phase, not two-phase process, of which TISA was the first phase, the current CFS project is the second phase (having substantiated our hypothesis), and a follow-on CFS II project would be the third phase.

The following lists the key lessons from the CFS project's business development interventions.

1] Strategic integration produces quick gains

In the piloting phase of introducing circularity in rural communities, it is beneficial to purposefully select a small number of enterprises where there are clear synergies and opportunities for integration. The CFS project demonstrates business success by both expanding existing businesses through adding circularity components, establishing new components of existing businesses, and supporting the establishment of new businesses. The AIP's participatory processes played a critical role in identifying areas where there were a need and demand for new business products or services. Quick gains can be

made by identifying products or inputs currently sourced from outside the community and substituting them with locally produced alternatives, which immediately benefit consumers, farmers, or business owners through reduced costs and new income.

2] Business planning to identify by-products builds economic resilience

The most efficient businesses view waste as a valuable by-product and turn circularity into financial gain, which is achieved through strategic business planning. For example, the milling of crop residues to produce high-value feed contributes to livestock survival during droughts and to efficient use of resources, increasing both household income and climate resilience. Additionally, businesses such as Freshmark and Sebenza, in Zimbabwe, have already demonstrated up to 80% decrease in the cost of synthetic fertiliser by using on-farm by-products.

3] Establishing, strengthening and extending business network synergies accelerates business development

The AIPs were instrumental in fostering beneficial business networks, internally (within the community) and externally. Connecting business owners with financiers has helped secure a bank loan for infrastructure and operations expansion for Kapungu and Sebenza businesses in Tanzania and Zimbabwe, respectively. Furthermore, connecting local businesses has allowed sharing of knowledge about similar business needs: for example, an exchange of information about irrigation systems between Freshmark and Nhlizluc Poultry enabled Nhlizluc to improve their water abstraction processes.

4] Leverage off capital diversity and agility is critical under current formal lending constraints

The CFS project facilitated linkages with financial institutions and provided skills in business plan development, mentoring, and support to obtain business registration and open bank accounts, which are all critical enabling factors for accessing finance. While the Mozambique approach shows promise for formal financial support, only two of the case study businesses have so far accessed formal loans via banks (Kapungu in Tanzania and Sebenza in Zimbabwe). While the CFS project has provided financial mentoring, there is a general lack of access to capital in Zimbabwe. In Tanzania, banks do not provide loans for new businesses, and for existing businesses they require borrowers to establish a record of depositing and withdrawing money over time. Overall, entrepreneurs face significant challenges obtaining finance for expanding or starting new businesses. It is therefore of note that the case studies illustrate a diverse range of approaches to generate capital: matching or revolving funds from donors, selling livestock, remittances, retirement savings, two or more households pooling resources, investing profit from existing business or from other income-generating activities, local savings and lending groups, and small incremental savings. These approaches reflect a paucity of accessible and viable loan

options, but also, in some cases, a determination to avoid external debt and repayment schedules that don't match the time it takes for the investment to generate the necessary return. Ability, confidence and willingness are both important aspects of seeking formal finance. During the current CFS project, small profitable businesses have emerged, generating capital and confidence for business expansion. Once the entrepreneur gains confidence that the business can generate sufficient profit to service a bigger loan, and the finance institutions observe the cash flow of the existing businesses building over time, the willingness of both lenders and borrowers to take on bigger financial obligations will emerge.

5] Scale-appropriate infrastructure and technology are critical enablers of new businesses

Reliable and sustainable infrastructure is an important business enabler, and the case studies illustrate new ways of doing business in rural communities. Solar systems have been adopted and provide renewable energy for pumping water for drip irrigation (Freshmark, Sebenza) or powering egg incubators (Nhlizluc). Solar-powered machinery can substantially reduce operational costs and improve business viability, with Freshmark saving USD1,000/year in fuel costs. There are further opportunities for solar technology, particularly milk storage, and biogas for energy production. The acquisition of a trailer (made by a local youth training centre) enabled Jathalwasi to provide a mobile milling service to more remote households. Even relatively short distances can create a barrier to accessing milling, and manual threshing is labour-intensive, strenuous, and particularly burdensome for female-headed and labour-poor households. This convenient mobile service reduces drudgery, increases income through improved post-harvest efficiency, and adds to the households' food security. This business demonstrates the viability and feasibility of offering crucial mechanised services, which can make a significant difference to people's lives in rural settings.

6] Mentorship and business planning have multiplier effects on business development

Targeted business planning and technical mentorship from the CFS project have catalysed turning CFS businesses into viable and scalable enterprises. The program equipped entrepreneurs with practical skills in financial management, record keeping, branding, and market engagement, strengthening their capacity to create and manage profitable and sustainable operations. As a result, several businesses reported improved cost-efficiency and profitability through the circularisation of production, whereby by-products are repurposed as inputs for other enterprises within the same business. This innovation reduced reliance on external inputs and enhanced resource use efficiency locally. The combined efforts have positioned the supported businesses for long-term resilience, investment readiness and contributed to local circular food systems. Mentorship and knowledge sharing have been critical for business success and flow-on outcomes. Mentoring has helped entrepreneurs secure finance and manage growth. Many of the mentees have now become mentors to others, creating a 'multiplier effect' and scaling out of business development. Knowledge sharing is a powerful way to stimulate new ideas and motivate

others to ‘have a go’; thus, spreading circular business practices and building community prosperity and resilience.

7] Empowering champions for inclusion produces social returns

The CFS project’s ‘twin track’ approach to be inclusive of women and youth in all business activities and setting a target for inclusiveness has delivered encouraging social returns. The establishment of a new youth group and their seedling nursery has supported members’ networking, learning, confidence, and empowerment, and brought recognition around the district (Elimika in Tanzania). Case studies across the countries illustrate that female business owners have become champions and mentors for other women (Freshmark, Nhlizluc, and Sebenza in Zimbabwe, Lucy in Tanzania, and Farmer X in Mozambique). Purposeful role allocation (e.g., marketing and networking) in family-run businesses and partnerships has allowed female business partners to contribute to business management in strategic roles. Critically, enterprises are developing creative solutions to deal with long-standing social barriers, such as implementing cash-only policies (Freshmark and Sebenza in Zimbabwe) to circumvent gender bias in local credit dealings. This success validates that the project’s inclusion approach not only supports participation of marginalised groups but also empowers them to drive community-level change.

8] Creating businesses generates flow-on prosperity

Working directly with a small number of businesses can lift others up and increase opportunities. Some businesses are employing community members or selling products to individuals or shops for reselling, which brings immediate income benefits and flow-on beneficial outcomes for households. Business leaders and champions are providing advice, mentoring, training, and motivation for others to start or expand businesses. Some business opportunities are mushrooming, with poultry for meat or egg production particularly popular, and improving the availability and accessibility of nutritious products. The drivers may be fourfold: requiring limited land; ready community demand for nutritious produce; and short cycles enabling small-scale start-up, an activity that can start at a small scale and be expanded.

9] Building capacity and CFS scope requires incremental processes

Meaningful and lasting change takes time and collective commitment. The success of the CFS project is anchored on a strong foundation, building on the achievements of TISA, NGO funding in the form of matching grants, and deepening partnerships through AIPs. Capacity building, stretching back more than a decade, has laid a foundation for piloting circularity, including the strong team that implemented the project and their extended networks. Several businesses were initiated and self-funded by the increased income realised through TISA. The intent of localised food systems is job creation beyond

direct engagement in farming. Yet the introduction of agroecological practices and cropping and livestock integration are the building blocks of CFS systems, with processing, value adding, and non-farm employment opportunities emerging from these changes. Hence, agriculture will remain a critical component of CFS development. Development must take place in stages that are locally appropriate and at a pace of change that matches community and business development capacity. The case studies illustrate that after one year several of the businesses are already talking about expanding their production capacity and/or their geographical trading area.

Introduction

Southern and East African agri-food systems are at a critical juncture, marked by growing exposure to climatic vulnerability, resource scarcity, and the need for inclusive job creation, especially for youth and women (IPCC, 2023; Mueller & Thurlow, 2019). To safeguard the long-term sustainability of smallholder economies, especially those built around vital irrigation infrastructure, there is an imperative to shift from the wasteful and resource-inefficient linear economy model of take-make-dispose to a more sustainable model. Circularity and agroecology present regenerative and alternative development solutions that are powerful in that they combine economic, environmental, and social sustainability (van Rooyen et al., 2025). Importantly, the key enablers of this change in Africa are Micro, Small, and Medium Enterprises (hereinafter small businesses) that have local market penetration and deploy resource-efficient, contextually-relevant, circular solutions along short value chains. This collection of case studies captures the practical achievement of utilising such enterprises as the basis of creating sustainable and resilient local food systems.

The Circular Food Systems in Africa (CFS) project builds on the ten-year history of the Transforming Irrigation in Southern Africa (TISA) initiative. The TISA project enabled smallholder schemes and their farming households to become more productive and profitable by optimising water use through smart water scheduling tools (Moyo et al , 2024). This created the foundation for budding small businesses and the adoption of agroecological farming practices; hence, making CFS a viable next step by integrating irrigation with surrounding rainfed farming and livestock production, and farm and non-farm value-adding activities and businesses in Mozambique, Tanzania, and Zimbabwe. The project hypothesis was that the strategic development of small businesses surrounding irrigation schemes can help expedite rural growth. Coupled with circularity, which enhances water, carbon, and nutrient cycling, this will improve climate shock responsiveness. Through a co-design approach, the project used Agricultural Innovation Platforms (AIPs) to identify CFS business opportunities for women and youth, integrate farming systems, and resolve food system bottlenecks, such as in-field and post-harvest losses.

Project Approach

As part of its initial phase, the CFS project conducted a cross-country business survey with the study communities in Mozambique, Tanzania, and Zimbabwe to better understand the structures, needs, and potential of local agri-food businesses. The findings confirmed that most enterprises are micro in scale, with fewer than five employees, limited physical assets, and annual revenues under USD 10,000. These businesses, though small, are integral to local food systems and rural economies. Businesses include production-based enterprises (e.g., poultry, fish farming, horticulture, livestock (dairy, goats, sheep)),

manufacturing-oriented companies (e.g., feed mixing and food processing), service-based (e.g., milling, threshing, welding, agro-dealership), and hybrid models that integrate multiple functions. To move beyond traditional conventional production systems, the project adopted a circular food system (CFS) approach. The project identified three primary stakeholder groups: producers (irrigators rainfed farmers, and livestock keepers), small businesses (primary/secondary processors and retailers), and support structures (extension, Non-Governmental Organisations (NGOs), and governance) (Figure 2).

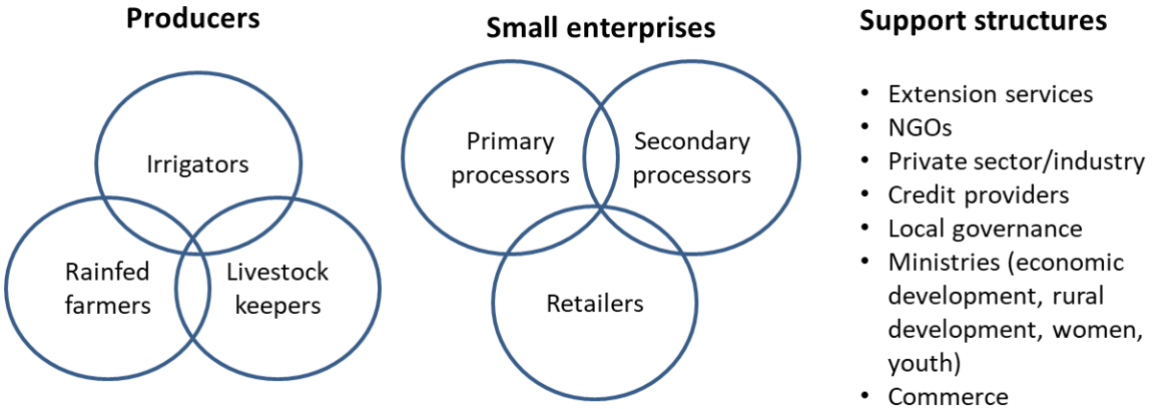

Figure 2: The multi-stakeholder ecosystem of circular food innovation systems.

Based on these insights, the project initiated targeted support to improve circularity and operational efficiency through business management, mentoring, and networking, focusing on business opportunities such as milling, composting, insect farming (black soldier fly, BSF), manure management, and feed production using crop residues. Central to this was a formal co-design process initiated through innovation platforms, which moved from participatory problem analysis and visioning to the conceptualization of "circular ecologies" where production systems are linked directly to small businesses. Irrigation schemes have emerged as foundational hubs for these systems, offering infrastructure, water access, and clustering potential. These early interventions highlight the critical role of local small businesses in advancing circular food systems and underscore the opportunity for scaling impactful, climate-smart, and inclusive business models across the region. In each country, the project identified and supported a diverse set of small agribusinesses. These include youth-led seedling nurseries, dairy and poultry farms in Tanzania, women-led milling and livestock operations in Mozambique, and value-adding enterprises around irrigation schemes in Zimbabwe. The businesses not only generate income and food but also demonstrate how circularity can be practically embedded through composting to generate organic fertilisers, local feed production, waste reuse, and low-input systems.

The development process in Zimbabwe and Tanzania followed a rigorous protocol: after identifying stakeholders, the project facilitated enterprise selection based on agroecological suitability and dual-

priority market analysis (Figure 3). This involved identifying gaps in the local food supply and exploring opportunities for primary and secondary processing, such as turning grain milling by-products into animal feed. Thus, enterprises were selected based on local demand (household food security requirements, replacing inputs and/or processing opportunities) and the demands of external markets beyond the immediate project areas. Through these AIP-initiated participatory processes, communities, extension agents, and value chain actors co-identified opportunities for enterprise development and received support in business planning, financial literacy, packaging & branding, and market engagement**.** This report provides case-based evidence of circular enterprise development in the three countries, capturing lessons on sustainability, inclusion, and community flow-on effect, and the potential for scaling small businesses within circular food systems as engines of rural development, economic empowerment, and climate resilience in Africa

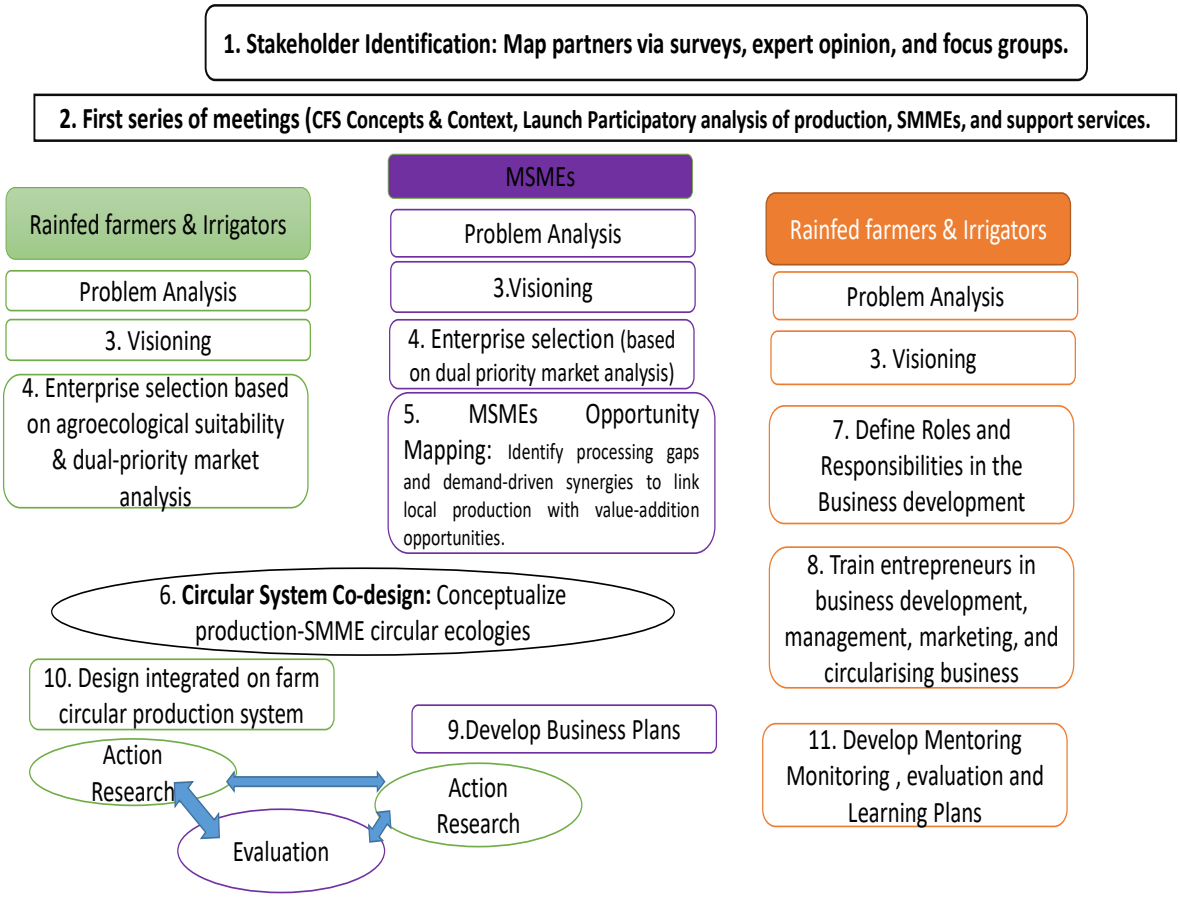

Figure 3:Co-design lifecycle for circular business development.

Methodology

The project employed a robust, multi-country case study methodology to evaluate the operational performance and systemic transformations generated by agribusinesses mentored under the CFS project in Southern and Eastern Africa. Moving beyond conventional agricultural evaluations, the methodology was founded on an action research method designed to examine the integration of circular and agroecological practices between primary production systems and small businesses and work collaboratively with them over time to improve circularity. Based on the AIP processes a total of 12 high-potential case studies were conducted across Zimbabwe (6), Mozambique (3), and Tanzania (3) Data collection took place through interviews with business owners and was governed by a multi-dimensional, standardised evaluative case study template designed to capture business outcomes and circular efficiency by linking products and by-products from farm production to small business as inputs and back to the farm for soil improvement or animal feed. To validate economic viability, the methodology focused on revenue generation, job creation and market demand, analysing how the integration of circular practices such as repurposing milling by-products for feed diversified income streams and enhanced the financial resilience of the enterprises. A critical component was the documentation of inclusive co-design, recording how producers, small businesses, and support structures collaboratively identified systemic barriers, development trajectories, and shared visions for growth. Finally, the framework assessed systemic impact by evaluating food security advantages, social inclusion, and sustainability within the CFS communities. These case studies provide evidence of how agroecological and circular practices lead to increased profitability of small businesses, as well as growth in the rural economy.

Zimbabwe country context

The implementation of business development activities in Zimbabwe followed a rigorous systematic, multi-staged, roadmap designed to transition local agri-food systems from linear production to integrated circular ecologies. This journey began with the Foundation & Diagnostic phase, centred on a comprehensive Business Baseline Survey to benchmark the scale, assets, and resource flows of small businesses. This data-driven start was supported by high-level inception meetings to secure vital district-level institutional buy-in (Figure 4).

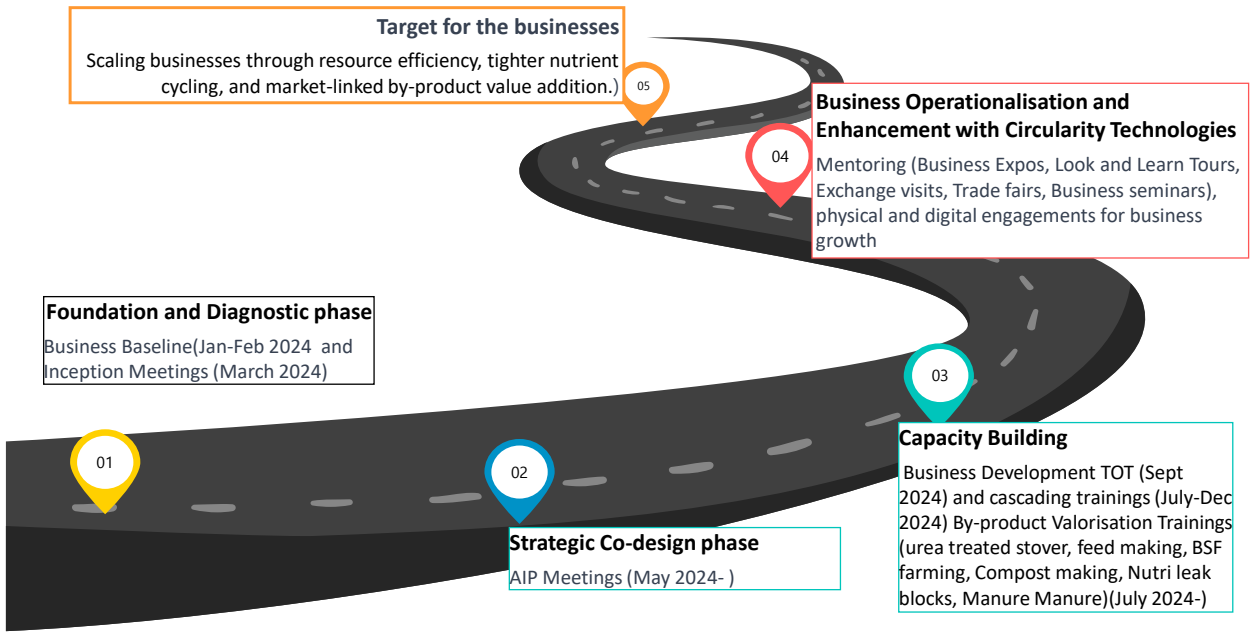

Figure 4: Zimbabwe business development implementation roadmap

Building on this foundation, the project moved into the Strategic Co-Design phase. This was anchored by Agricultural Innovation Platform (AIP) meetings, which facilitated Collaborative Problem Analysis, Visioning, Selection of High-Potential Circular Enterprises, and Circular Business Design. During these sessions, stakeholders co-identified systemic barriers and mapped opportunities to convert by-products, such as grain milling waste, into valuable inputs for poultry or dairy systems. The subsequent capacity building phase translated these co-design outcomes into action through a "Training of Trainers" (ToT) model and cascading business workshops. These sessions focused on formalizing business management and product profiling to ensure the economic resilience of the circular models. Finally, the Business Operationalization and Enhancement with Circularity Technologies phase initiated formal business

registrations and ongoing mentoring activities. This implementation stage utilises Action Research to evaluate circular efficiency by continuously collaborating with the small business owners to trace the flow of products and by-products from small businesses back to the soil or animal feed, regularly looking for further circularity improvements to help ensure the system continuously improves sustainability. Table 1 gives a summary of the activities across the phases.

Table 1:Zimbabwe implementation activity matrix

Phase	Activity	Strategic Purpose
Foundation	Business Baseline Surveys	To establish a data-driven benchmark for revenue, assets, and current resource use.
	Inception Meetings (Project, District level)	To ensure regional policy alignment and stakeholder commitment.
Co-Design	AIP Sessions	To collaboratively identify barriers and design enterprises that close nutrient loops.
Capacity	ToT & Cascading Trainings	To disseminate business knowledge and scale technical business skills across the community.
Action	Mentoring & Registration (Ongoing)	To transition businesses into formal entities while providing longitudinal support to track evolving revenue and nutrient flows.

The Zimbabwean case studies depict an ecosystem of circular small businesses that potentially support one another through exchange of resources, value addition, and integration of local value chains (Figure 5, Table 2). Businesses have different but complementary positions within the wider agri-food system, encompassing input supply, primary production, and secondary or tertiary processing; thereby, creating a closely interconnected network that constitutes the emergence of a local circular food system. For example, Nhlizluc PBC potentially links upstream and downstream operations by producing poultry, providing hatching services, and milling feed, with part of the input being obtained from locally cultivated agricultural products, and delivering the chicks and poultry products to the farmers and restaurants. Freshmark, and Sebenza Sweat for Sweet, are examples of integrated farming systems, with horticulture, livestock, and aquaculture, which utilise the manure and pond effluent to fertilize crops and feed their livestock crop residues, respectively. Likewise, Jathalwasi and Trust and Reuben Threshing offers mobile mechanised processing services, which include milling and threshing, which minimise post-harvest losses, increase the availability of feed, and reduce drudgery among smallholders. Their mobile business allows them to effectively treat heavy residues and grains and turns, what is often considered as waste, into livestock feed. Taking a bigger approach, Hauke Dairy supports the circular food system by developing local demand for livestock feed crops and processing of residues, and by producing quality dairy products, that are an added source of nutrition and income generation in rural areas. These enterprises combined illustrate the potential of a local circular food system, where one business provides inputs to another, enhancing resilience, minimising waste, and advancing

inclusive and climate-wise growth. Figure 5 illustrates how the case study businesses and all the other businesses supported by the CFS project (listed in Table 2) can collectively contribute to a local CFS.

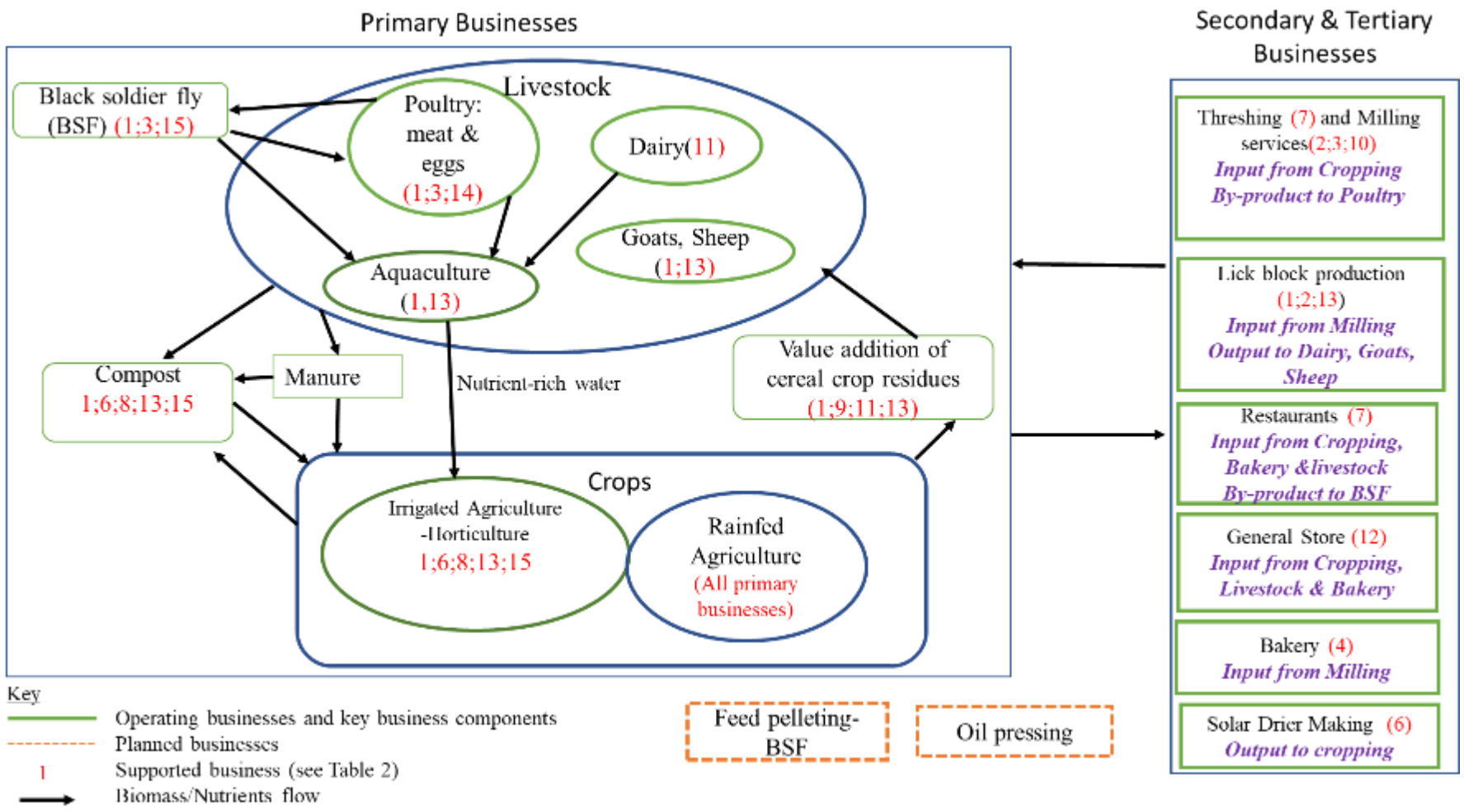

Figure 5: Zimbabwe CFS linkages

Table 2: Summary of new and enhanced CFS-supported businesses in Zimbabwe

#	Business participation	Business focus	Circularity elements added		Funding source for new or enhanced components	Key outcomes for business owners	Flow-on outcomes for community
			New business or new component of existing business	Enhanced component of existing business			
Zimbabwe							
Silalatshani							
1	Freshmark BD; CS; R; LF; M	Aquaculture Horticulture Poultry (eggs)	Goats and the use of lick blocks Broilers	Aquaculture with BSF Horticulture- chemical compost, manure treatment, reuse of aquaculture water, and diversified crops Poultry (eggs) - BSF	Remittances, profit from irrigation (TISA stimulated)	Diversifying income Family nutrition Restored dignity and recognition Regenerative system	Employment (5 permanent; 2-5 part-time) Spreading knowledge Community nutrition
2	Jathwalasi milling BD; CS; R; M	Milling of food and feed Chopping stover	Feed making-urea treatment, mucuna bales Nutri- lick blocks	Mobility of the mill (movable trailer)	NGO matching grant scheme (ZRBF) (30% own funds), CFS project	Income Livestock improvement	Trailer made by the youth training centre Spread of knowledge Accessible milling, Employment (4 part-time) Livestock resilience
3	Nhlizluc BD; CS; R; LF; M	Poultry, Milling & Feed Making	Feed Making	Livestock feed making (hay bales, urea stover treatment, nutritious lick blocks from by-products, wild-collected seeds and fodder production	Retirement Savings	Increased income from egg and bird sales. Revenue from milling services and feed sales	Job creation, hatchery services to expand flocks locally Improved access to nutritional food from diversified protein sources
4	Godlwayo Phakama Bakery BD; R	Baking		Sourcing raw materials (part of the flour) locally Packaging & Branding of products	Savings Income Savings and lending Schemes (ISALS)	Increased sales Increased confidence from business networking events Reducing external inputs	Availability of low-cost bread and confectionaries

#	Business participation	Business focus	Circularity elements added		Funding source for new or enhanced components	Key outcomes for business owners	Flow-on outcomes for community
			New business or new component of existing business	Enhanced component of existing business			
5	General dealer store BD	Selling grocery items	Repackaging produce from scheme Selling solar dried local spices	Linking with surrounding farming households for supply of kitchen "waste, used as livestock and pet feed (poultry, dogs, pigs)	Own savings	Improved profit margins from own packaging of locally sourced products (sugar beans, culinary herbs)	Improved product diversity to achieve food security and improved market access for farm output
6	Silalabuhwa Progressive Youth for Carpentry (SPYC) BD; R	Solar drying equipment	Making solar driers	Reducing waste through preservation (drying)of produce from the scheme Demand creation for solar driers	Government grant (Smallholder Irrigation Revitalization Programme)	Increased Incomes	Quality dried produce
7	Restaurant BD	Preparation of fast food		Linkage to pig businesses for selling "waste" Linkages with irrigators and rain fed farmers delivering vegetables, maize and traditional grains (millets, sorghum) flour	Savings ISALS	Income Reduced transaction costs by procuring locally	Access to convenient food Employment creation for locals
8	Vukani Cooperative BD; R	Horticulture (green mealies, various vegetables) and grain (wheat, sugar beans), Solar drying herbs		Thermal compost making for soil fertility improvement Urea stover (wheat, maize) treatment for livestock feed	Savings from the irrigation scheme	Improved profit margins from reduced bought inputs (use of diverse cropping systems (intercropping and rotation) including nitrogen fixing legumes)	Improved food security from diverse crops in the market locally
9	Abel Mathe Feed Making BD; M	Cattle feed making		Value addition to stover (urea, molasses treatment of irrigated crop residues	Profit from the irrigation plot	Increased income streams	Reduced livestock mortality and poverty
Hauke							

#	Business participation	Business focus	Circularity elements added		Funding source for new or enhanced components	Key outcomes for business owners	Flow-on outcomes for community
			New business or new component of existing business	Enhanced component of existing business			
10	Trust & Reuben BD; CS; R; M	Cereal threshing		Feed formulation from threshing by-products.	Own (irrigation and rain-fed)	Increased revenue from farm threshing services, expanded client base across multiple wards, improved business management and operational skills	Improved grain quality (less spoiled product), Job Creation, Reduced labour burden on processing for local farmers, Time saving, Knowledge sharing
11	Hauke Dairy BD; CS; R; M	Dairy		Livestock feed formulations from by-products (urea-treated stover, nutri-leak blocks)	NGO matching grant scheme (ZRBF) (30% own funds)	Increased milk production and dairy profitability Enhanced skills in business management and market linkages	Sale of processed dairy products Employment for local youth and women Manure for soil fertility management Residues for the dairy business
12	General Dealer BD	Selling groceries and fresh and dried products from the Hauke irrigation scheme	Sourcing some agricultural products locally		Profits from the Hauke irrigation plot	Increased income	-Diverse foods for the community -Job creation
Pollards							
13	Sebenza Sweat for Sweet BD; CS; R; M	Aquaculture Horticulture Goats Sheep		Aquaculture home-made feed from BSF Horticulture-thermal compost Goats & Sheep-Nutri leak blocks, urea-treated stover	Asset liquidation (cattle, goat, and sheep sales)	Enhanced Resource Efficiency from Circularity (reduced input costs), Improved business income	Employment Creation and Youth Engagement, Increased investment readiness and knowledge transfers to neighbouring farmers.

#	Business participation	Business focus	Circularity elements added		Funding source for new or enhanced components	Key outcomes for business owners	Flow-on outcomes for community
			New business or new component of existing business	Enhanced component of existing business			
						Market Linkages with financiers and input suppliers Regenerative systems	Community food and nutrition Security
14	Konyathi Poultry BD; R; M	Broiler production	Broiler	Thermal composting using poultry bedding	Start-up capital gift from parents	Income for the business	Protein source for the community
15	Veggie Vibes BD; R; M	Horticulture Piggery	Thermal compost	BSF Pig manure management for soil fertility enhancement	Own savings from farming in Pollard's irrigation scheme	Improved income Reduced costs of production from reduced bought inputs, i.e. inorganic fertiliser Regenerative systems	Improved nutrition for the community (meat and horticulture sourced locally)
16	Mycology Masters BD	Mushroom		Making substrate from local stover	Own savings	Increased income	Access to good-quality mushroom product locally and throughout the year

Note: BD=business development support, LF=lead farmer; CS=has a case study write-up; R=formally registered; M=received additional mentoring

Case Study 1. Jathalwasi Milling Business

(GPS: 35K 741353 7699663)

Background

Jathalwasi Private Business Corporation (PBC), located in Ntuthuko Village, Ward 3 of Silalatshani, Insiza District, is a milling business established in April 2024 by four local farmers in response to the severe 2023/2024 drought that heightened demand for livestock feed. The business was funded by partner capital, and the CFS project donated the trailer. Using a hammer mill purchased with matching donor funds (70% of cost), Jathalwasi offers milling services for food (mealie meal from cereal) and feed (leaves, twigs, and crop residues). Supported by the Circular Food Systems (CFS) project, Jathalwasi developed a business plan, registered as a Private Business Corporation, and acquired a trailer to transport the hammer mill. This mobility enables the business to adapt to seasonal demands and varying milling requirements. By bringing services directly to the site, bulky residues can be processed efficiently, providing convenience and value to customers. Operating without permanent employees, members rotate shifts to run the business smoothly. Customers comprise local farmers within the Silalatshani irrigation scheme and surrounding rainfed farming households. Plans include expansion into value addition, i.e. milling and packaging livestock feed and mealie meal.

Contribution to circular food systems & agroecology

Jathalwasi Milling Business plays an important role in developing a circular food system in the Silalatshani region since it uses locally grown grains and crop residues to produce useful products such as maize meal flour that people can consume and livestock can use as food (Figure 6). This will reduce wastage, recycle nutrients, and decrease residue burning or selective grazing by livestock. Crop residues are processed (chopped and some value added through urea stover treatment), thus enabling complete residue use to enhance feed intake and resource use efficiency. Residues are also chopped for use in compost making to improve soil fertility and health due to a more nutrient-rich organic manure. By-products such as bran are also produced during the milling process, and they are utilised in making livestock feed such as lick blocks. These activities of Jathalwasi show the usefulness of the principles of circularity and agroecology in practice. The business consumes approximately 20 litres of diesel to process five tonnes of crop residues, and the machinery is serviced regularly to keep it efficient and with minimal emissions. The business is privately owned and collectively operated by the founders and runs a loosely structured labour arrangement, hiring two to four casual workers. The profits are reinvested to increase the capacity of processing through servicing equipment and transporting the machinery to reach more farmers. Last season, Jathalwasi initiated a pilot project to cultivate Mucuna

(velvet bean) as a new very nutritious feed component, increasing the income stream and business sustainability.

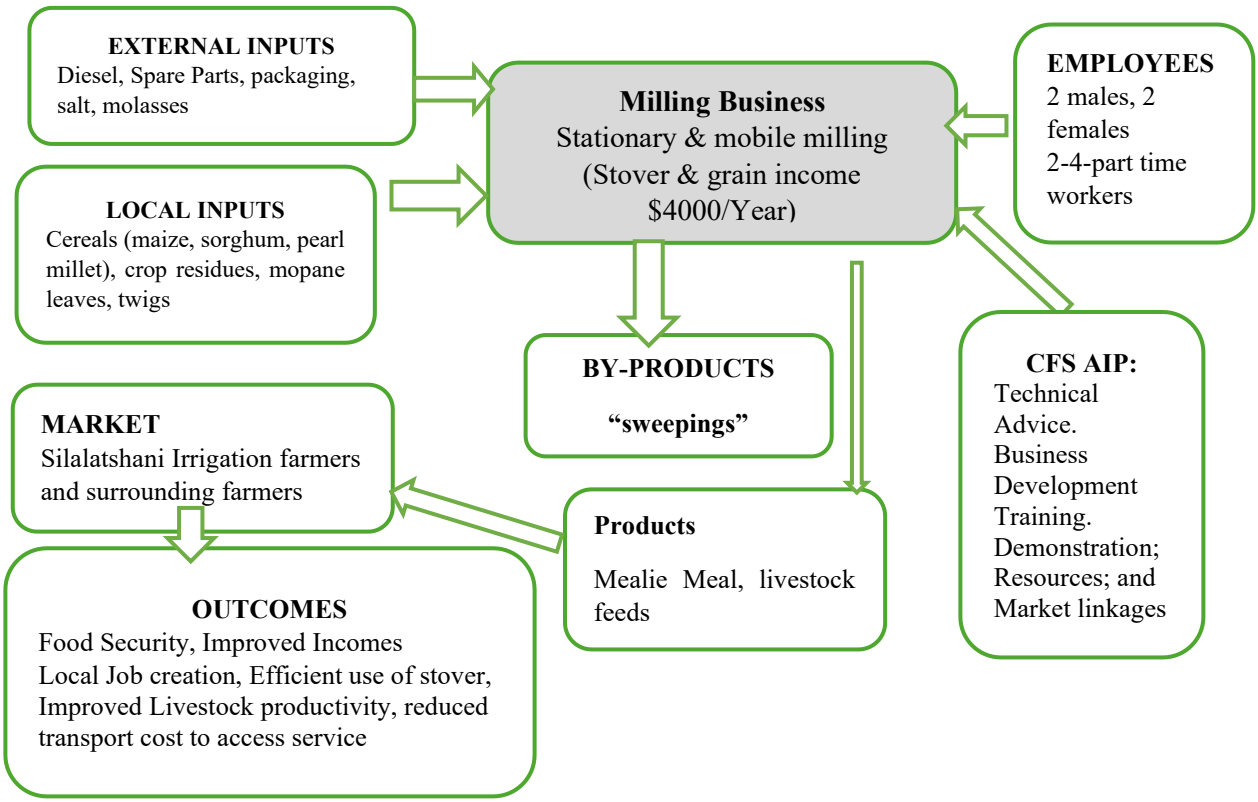

Figure 6: Jathalwasi Milling Circular Business Value Chain

Inclusion

Jathalwasi was established by four local farmers, two men and two women, and intentionally promote gender-balanced ownership and inclusive decision-making. Women in Jathalwasi contribute primarily through marketing and community engagement, while the men focus more on the physical labour involved in milling and processing. This reflects the challenges women face in contributing equal physical labour and balancing their availability with cultural expectations and domestic workloads that limit their mobility. Thus, the women owners of Jathalwasi have strategically assumed roles that play to their social strengths and offer an empowering role in underpinning business development. However, the enterprise's early attempts at youth inclusion revealed systemic barriers. Notably, an 18-year-old male youth living with a disability was initially invited to join the founding team but was excluded from formal company registration due to challenges in raising subscription fees. This underscores the persistent need for targeted support mechanisms to facilitate equitable participation for marginalised groups, particularly young people with disabilities.

Economic, social, and food security benefits of the business

A community-based agribusiness, Jathalwasi, allows its partners in the community to create high-quality and low-cost livestock feed using local by-products and other inputs. In the last year, Jathalwasi produced about seven tonnes of feed using collected leaves, crop residues, and natural grasses (bush meal), which has fed about 2,800 cattle in the community. This initiative has reduced farmers' costs, as supplementary feed purchased from Bulawayo or South Africa is very costly. The business improves the income or the owners and the two to three members of the community who are given part-time jobs. It also enhances food security within households, as it provides cheap milling of staple foods, and reduces households' travel time to have their grain processed. During dry seasons, the increased availability of quality cattle feed improves farmers' climate change resilience and empowers them to save their livestock, which are key smallholder resources. Low-priced milling facilities encourage more farmers to mill their residues, thus producing affordable and nutrient-rich feed. This subsequently increases the productivity of the livestock by increasing their growth rate, weight, milk production, and fertility. This has led to higher-priced farm animals, and farmers can increase their stock numbers faster since they are able to reduce the mortality rate and increase their breeding success. Livestock productivity gains have led to a more consistent supply of animal protein locally, contributing to the community nutrition and food security.

Maize stover loaded in scotch carts awaiting milling (left); and stover processing in progress (right), demonstrating value addition and efficient use of crop residues.

Business sustainability and resilience

Jathalwasi has a high potential for long-term viability with several strategic enhancements that have been supported by the CFS project. This collaboration enabled the enterprise to have a comprehensive business plan that gives a clear road map to expansion, division of responsibility, and sustainability. The

legal and financial positions of Jathalwasi have been boosted by being a registered Private Business Corporation, giving the company access to credit and investment to facilitate the expansion of operations. CFS training also contributed to increasing the team's record keeping, and financial and cost management skills, allowing the business to make decisions based on data and increase its operational efficiency. Further, working relations with the agricultural extension officers and CFS partners have provided technical support, quality control, and linkages to the market that strengthen the competitiveness of the business. As a self-sustaining, organised establishment, run by four dedicated farmer-partners, who also use their own services for their farm operation as well as an income earning activity Jathalwasi is a resilient enterprise with tangible plans to increase its service coverage to two to four wards. This would enhance its contribution as a driver of economic development, food security and local resilience.

The mobile mill offers accessible grain and stover milling services to local farmers, enhancing value addition and reducing post-harvest losses.

Reflections and learning

Key learnings in establishing the Jathalwasi business highlight the value of resilience and adaptability. This is demonstrated by the innovative use of draught power for transporting the hammer mill to customers, which significantly expanded their service reach. Success has also been built upon continuous learning through Business Development and Value Addition training and networking events supported by the CFS project, underpinned by the owners' shared business vision.

Reflections on CFS project mentorship & support

“The trade fair in Bulawayo opened our eyes to see that there is potential for growth and we need to work hard”, says Mr Jabisile Ncube, one of the owners of the business. Notably, the trade fair trips organized by the CFS project opened new avenues for learning, market exploration, and networking. These experiences have transformed the way Jathalwasi approaches its business, instilling a more innovative and entrepreneurial mindset.

Case Study 2. Freshmark Business

(GPS: 35K 735646 7695742)

Background

Freshmark, located in Silalatshani, Insiza District, is a family-run horticulture, poultry, and fish farming enterprise founded in 2020 by Mrs. Dube, a widow, and her three children. It was launched to bridge the gap in reliable vegetable supply and diversify income amid severe droughts. The enterprise transformed a 0.8-hectare homestead into a green oasis using a solar-powered pump to extract water from the Umzingwane River. Sixty percent of the initial capital came from cattle sales, 20% from remittances from a son in South Africa, and 20% from personal savings from farming in the Silalatshani Irrigation Scheme. Freshmark produces vegetables, fish, poultry, goats, and cattle. Its model emphasizes low-cost, high-quality food through low use of external inputs and more organic fertiliser sourced from on-farm livestock and compost. Livestock are fed with supplemental feed mixes made on-farm from crop residues and supported by the CFS project training. Freshmark provides year-round fresh vegetables and poultry to local households, business centres, restaurants, boarding schools and towns.

Contribution to circular food systems & agroecology

Freshmark embraces the key principles of a circular food system and agroecology with its efficient and resource-wise farming (Figure 7). The company obtains 80% of its feed stocks locally, which favours the local economy and minimises reliance on external suppliers. The by-products from poultry are used as fertiliser in vegetable farms and as feed in fish farms, and nutrient-rich water from the fishponds is used to irrigate agricultural produce; thus, recycling nutrients and reducing wastage. To minimise harvesting losses, Freshmark will do market research and take customer orders before harvesting and match the demand with supply. The company has control of the entire production chain, i.e., poultry and fish slaughter, dressing, and storage in deep freezers, to be delivered when required by the company's own transport. Currently, the remaining by-products are feathers, and the team is looking at ways of reusing these, including making pillows. By-products from fish slaughtering (offal, heads) are composted into fertiliser for use in horticulture.

Chickens in a fowl run, where manure is collected and used as organic fertilizer for crops (left); and Mrs. Dube in her horticulture field, where organic manure is used and crop trimmings at harvest feed livestock (right).

The agroecological practices include integrated soil fertility and pest management and crop rotation to improve he soil structure and break the pest cycle and utilise soil moisture monitoring tools (Chameleon and Full Stop) to increase water efficiency. Building on CFS training, Freshmark transforms crop residues, such as green mealie husk and vegetable trimmings, into compost and feeds fresh stover to livestock, enhancing nutrient recycling. Mrs. Dube produces livestock nutrition lick blocks to supplement feeding. The horticultural business component is characterized by a balanced combination of products: staples (green mealies, butternuts), vegetables with a high level of vitamins and minerals (carrots, tomatoes, peppers), and crops containing protein and fibre (fine beans). Thus, the business satisfies both health and environmental needs.

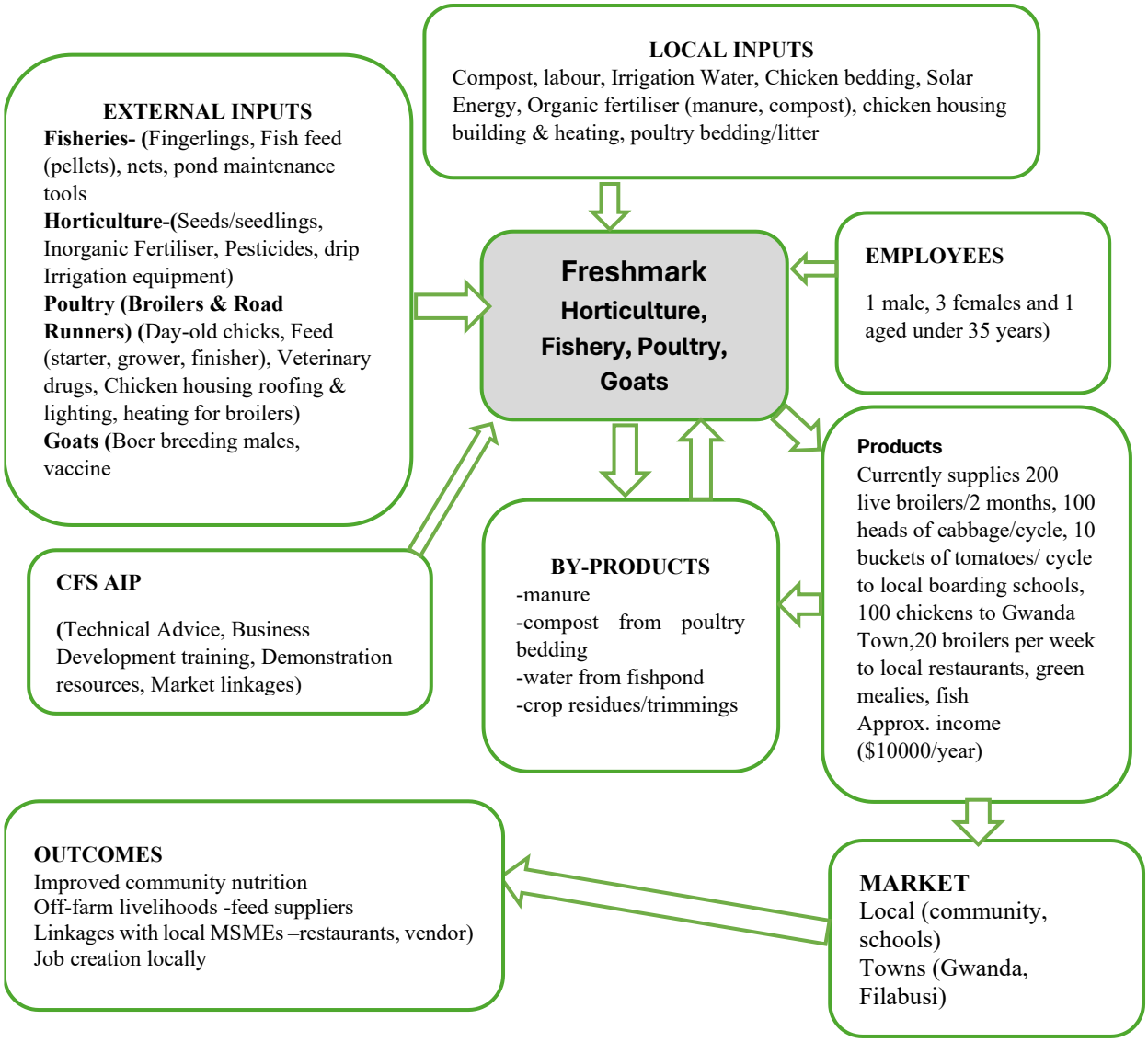

Figure 7: Freshmark Circular Business

Inclusion

The day-to-day running of the business is led by Mrs Dube, assisted by her daughter and daughter-in-law. The business employs one youth on a permanent basis and varying numbers of local women during peak labour demand. The business currently faces an operational bottleneck. Despite owning a truck, the son based in South Africa is the only licensed driver. When he's absent, they rely on hired vehicles, incurring a cost of $30 to $70 per trip. To address this and improve women's empowerment, the business is planning for the women to obtain their driver's licenses, which will reduce reliance on external transport and strengthen internal capacity. The business has been a training centre for good agronomy, livestock husbandry, and circular technologies for other local, upcoming primary businesses, including young female farmers. Ten farmers (5 females, 5 males) have started their own businesses after learning

from her. To address challenges of delayed or non-payment, often linked to a lack of respect for women-led businesses, Freshmark is now shifting to a cash-only payment on delivery policy, minimising and moving towards eliminating credit-based transactions.

Economic, social, and food security benefits of the business

Freshmark has provided a lot of economic, social, and food security advantages for the community. Since 2024, there have been two fish rearing cycles, each earning almost USD 1,000 in revenue, and all the other sales earned around USD 10,000/year. In terms of economics, the business provides two full-time male staff, one being a young person, and two to five local workers who are part-time and paid in cash. This employment leads to better livelihoods of the employees and their families. The innovative application of compost and poultry by-products as manure in the agricultural operations saves cost. The business is benefitting from a symbiotic relationship between aquaculture and horticulture, where water from the ponds, that is rich in nutrients, is used to irrigate the horticultural crop, minimising wastage and optimizing the use of resources.

Visitors participating in a look-and-learn tour at Freshmark fishponds (left); and Freshmark staff harvesting tilapia fish, demonstrating practical aquaculture techniques and knowledge exchange (right).

Notably, approximately 5 scotch carts of manure are utilised in the 0.8-hectare horticulture field, replacing around 80% of synthetic fertiliser, reducing fertiliser costs. The adoption of the solar pump has reduced energy cost, the business avoids using approximately 40 litres of petrol per month, translating to an annual saving of USD 1,000. Social benefits are evident in the improved livelihoods of employees and the local community, who have access to low-cost, high-quality food. Freshmark's operations contribute to local economic growth, as its business model is being adopted by other farming

households that have already invested in water abstraction from the riverbed. In terms of food security, Freshmark provides the local community with access to quality live and frozen chicken meat, fish, and fresh vegetables. This ensures a consistent supply of nutritious food, enhancing the overall well-being of the community and children's nutrition, particularly by supplying schools. By supporting local food systems, Freshmark contributes to a more resilient and sustainable food security framework.

Business sustainability and resilience

Freshmark demonstrates strong evidence of sustainability, ensuring its long-term viability. The business has benefited from various CFS capacity building initiatives including training and workshops, mentoring and networking opportunities. The business now has a well-developed business plan, outlining objectives, financial projections, and growth strategies. Furthermore, Freshmark has established partnerships with local agricultural networks, extension services, and private sector entities that provide mentoring support, technical guidance, and market access. The business has also invested in infrastructure, including two solar-powered fridges and a hatchery, which enhance operational efficiency and capacity. Additionally, Freshmark has a growing customer base, currently serving the local ward, two boarding schools, and Filabusi mobile kitchens, demonstrating increasing local demand and revenue potential. With a clear business plan in place, Freshmark is working towards expansion, targeting new markets (Gwanda town), and solidifying its position as a sustainable and viable business.

Reflection and learning

Key learnings from Freshmark's establishment include the importance of family unity, trust, adaptability to market shifts, and resilience. Critical factors has been access to local markets, solar-powered technology, access to capital, and a solid business plan. Future improvements could focus on expanding value chains and exploring new high-value crops like turmeric.

Reflections on CFS project mentorship & support

The training, knowledge and expanded networking imparted by TISA and the CFS project have been pivotal in Freshmark's success. TISA enhanced the business's primary production capabilities through training on water monitoring tools and improved profitability as a basis for diversification. Additionally, training in feed production, business planning, and record-keeping during CFS provided a clear direction, enabling accurate expense and income tracking. Mrs. Dube has become a champion female farmer, hosting field days, sharing expertise, and empowering other women farmers.

Case Study 3. Sebenza Sweat for Sweet Business

(GPS: 35K 686123 7824802)

Background

Sebenza Sweat for Sweet (hereinafter "Sebenza"), located in Inyathi, Bubi District, Zimbabwe, is a diversified agricultural enterprise, founded in 2023, specialising in integrated horticulture, small-scale livestock, fish farming, and feed supplement production. Led by visionary female entrepreneur Nomuhle Sibanda, the business is expanding with support from the CFS project. Inspired by a friend's successful livestock venture, Nomuhle identified a market gap for fresh, affordable agricultural products for local small-scale miners. She sold cattle, sheep, and goats to fund the construction of fishponds and the installation of a drip irrigation system, utilising water from her borehole. Currently in its growth phase, the business focuses on primary production, processing crop residues into urea-treated stover for livestock feed and selling horticulture and poultry products to the community. It uses livestock manure and compost, and pond water to fertilize crops and employs efficient drip irrigation. Sebenza also produces Mucuna hay, urea-enhanced stover, and rears black soldier flies (BSF) for fish and poultry feed.

Contribution to circular food systems & agroecology

Sebenza demonstrates a strong commitment to integrating the principles of circularity and agroecology into its operations (Figure 8). Notably, the business sources 90% of its feed inputs locally, courtesy of its own inputs and the nearby Inyathi growth point (3km away), which reduces distance and reliance on external resources and promotes local economic development. Additionally, Sebenza has implemented various strategies to close nutrient loops, minimise waste, and promote environmental sustainability. The business utilises poultry, goat, and sheep manure in its horticulture production and produces BSF larvae as a sustainable protein source for chicken and fish feed supplementation. The business has diversified its operations to include hay production from Mucuna (velvet bean), which reduces the need to buy feed. Through a urea treatment process, stover is transformed into a nutritious feed supplement, reducing waste, promoting resource efficiency, and providing essential nutrition to livestock during the winter months. Sebenza 's reliance on solar power for its irrigation system reduces its fossil fuel energy consumption. The business is also using intercropping and crop rotation to enhance soil fertility and break pest and disease cycles.

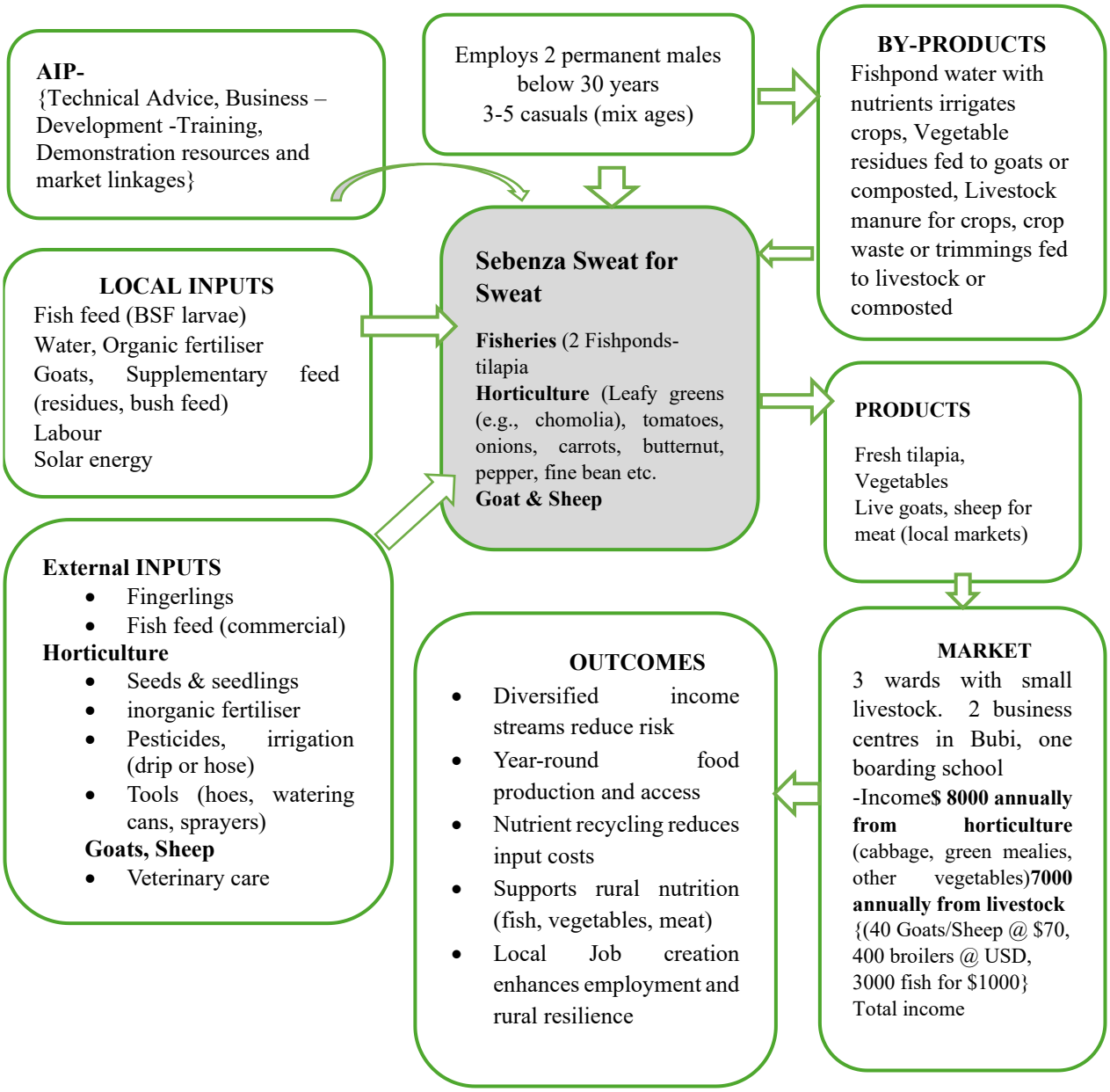

Figure 8: Sebenza Sweat for Sweet

Inclusion

Sebenza was founded by a woman entrepreneur who successfully overcame significant personal challenges, including divorce, to establish the thriving enterprise. The business actively promotes social inclusion and economic opportunity, primarily by employing local youth. It provides permanent employment for two young men and offers casual work to between five to ten young people during peak periods, integrating them into the value chain and providing crucial income. The business also fosters collaborative relationships by engaging local suppliers, distributors, and retailers within the

community. Despite its success, the founder faces operational hurdles, including difficulties collecting payments from some clients (such as small-scale miners) and addressing instances of theft by workers and community members. Her 26-year-old son has provided critical support in overcoming these challenges. Despite these pressures, Sebenza remains committed to creating opportunities for marginalized groups (including women and youth) and has emerged as a champion entrepreneur in her community.

Fishponds (left), where nutrient-rich water is reused to irrigate horticultural crops (2nd and 3rd); livestock such as sheep providing manure for crop fertilization (fourth); and hay stored under shade for feed (right) - demonstrating an integrated circular farming system.

Economic, social, and food security benefits of the business

Sebenza helps to boost the local economy in terms of employment and enhances sustainable and cost-effective farming. The business has two full-time male employees and offers flexible part-time employment to 5-10 persons. Those employed supplement their household earnings and enhance their livelihoods. By being creative in resource utilization, Sebenza has realized significant savings in costs by reducing reliance on commercial fertilisers through targeted application of compost to each plant rather than broadcasting, through incorporation of by-products such as organic poultry manure, and reuse of nutrient-rich fishpond water in irrigation. These practices also increase soil fertility, minimise waste, lower the environmental footprint of the farm, and generate estimated savings of more than US$500 per season in fertiliser cost. In addition to being efficient in production, Sebenza enhances local food security by delivering fresh and affordable vegetables to the community and delivering healthy

produce to schools in the community, providing children with regular and consistent access to healthy food. The business has also established an aggregation model to address increasing market need and to ensure a reliable supply by procuring produce from nearby smallholder farmers. The model, therefore, allows an inclusive market presence and strengthens local value chains.

Business sustainability and resilience

Sebenza demonstrates strong potential, driven by a well-structured business plan and a growing customer base across diverse markets. Experiencing rising demand, particularly for small livestock, the business consistently achieves cost recovery and benefits from robust local networks established through CFS and AIPs, including private sector and extension services. To capitalise on the unmet small livestock demand, Sebenza is planning a new venture into aggregation. This will involve purchasing livestock from neighbouring farmers and adding value through a pen-fattening process to enhance weight and quality, thereby increasing revenue and sustainability.




Black soldier fly production (The cage, inside cage, BSF feeding on waste, BSF larvae for feeding livestock and fish

Reflection and learning

The establishment of Sebenza has yielded valuable insights, particularly by demonstrating that having products that meet community needs is crucial in attracting and retaining customers. Additionally, the business has demonstrated the importance of adaptability, especially when faced with unmet demand, and the value of collaborating with other farmers to bridge supply gaps. These key learnings have been gleaned through participation in expos initiated by the CFS project, which have provided a platform for engagement with customers, understanding of market needs, and networking with fellow farmers. The business has also recognized the value of integrating production processes and is actively exploring ways to reduce input costs while improving resource use efficiency.

Reflections on CFS project mentorship & support

The CFS project's mentoring activities have been instrumental in Sebenza's development, i.e., training, visits, and networking events to meet other businesses. The training received, particularly in agroecological farming practices, business planning, and record-keeping, has equipped the business with strategies to enhance profitability by reducing costs through circular practices.

Case Study 4. Trust & Reuben Threshing Business

(GPS coordinates: 35k 740853 77000)

Background

Located in Hauke, Bubi District, Zimbabwe, Trust & Reuben Threshing is a growing, two-family-owned rural agribusiness run by two men and two women. It was established in 2023 to address the local need for affordable, mechanised post-harvest processing. Recognizing the high labour costs and the limited access to equipment faced by smallholder farmers, the founders pooled resources to purchase a thresher. The business's primary focus is the provision of mobile threshing and dehulling services for maize, sorghum, cowpeas, and millet, positioning it at the processing stage of the local value chain. Trust and Reuben, who each owned successful milling businesses, pooled their profits to jointly finance and establish a new enterprise named Trust & Reuben Threshing. The business was supported and guided by the CFS project through mentoring in business development and business registration processes to help increase their chances of accessing finance to expand operations.

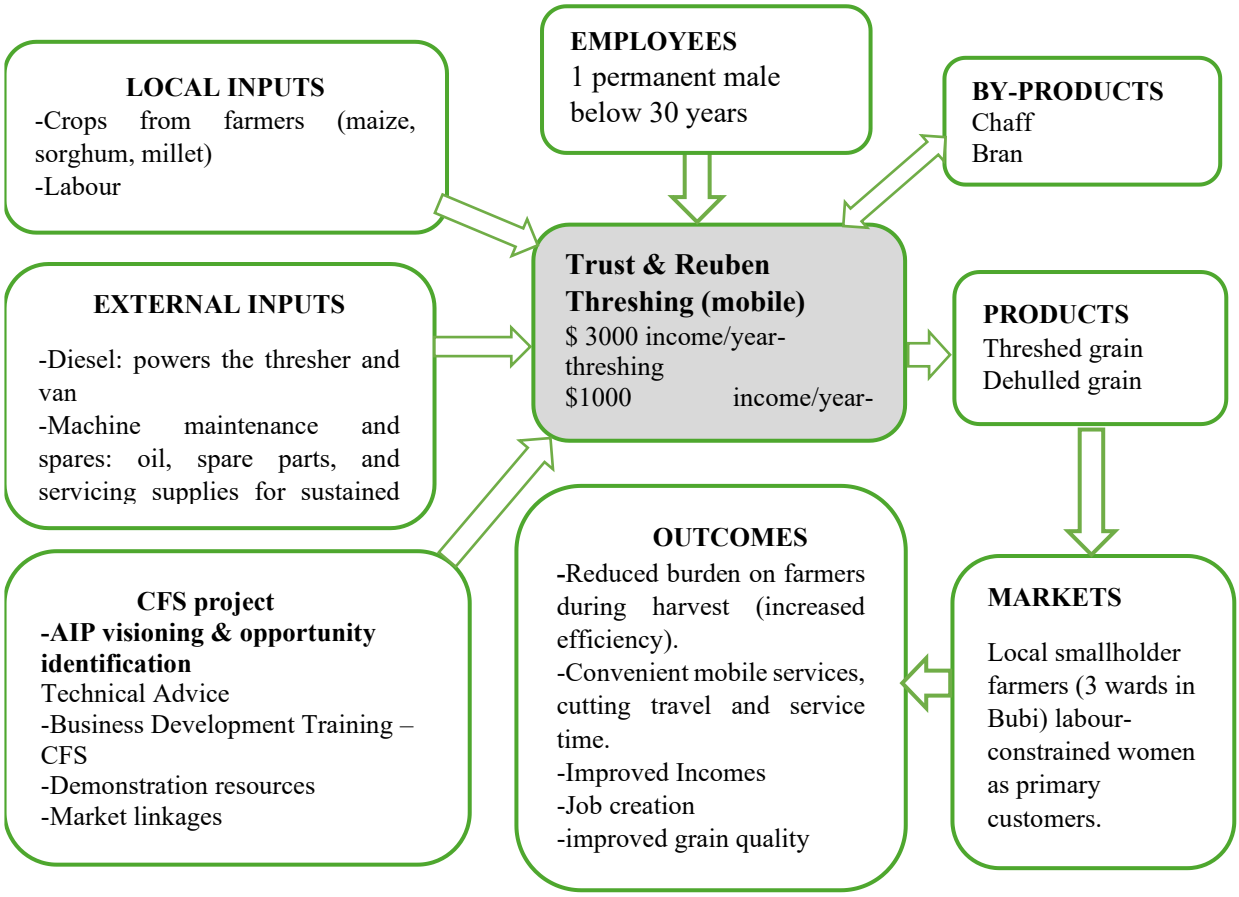

Figure 9:Trust and Reuben mobile threshing

Contribution to circular food systems & agroecology

Trust & Reuben demonstrates early steps toward integrating agroecological and circularity principles within its business model, particularly in resource efficiency and waste repurposing (Figure 9). Currently, the business runs on diesel-powered equipment**,** which supports mobility and flexibility, especially with the recent purchase of a van that allows the thresher to reach distant farming communities. Although fossil-fuel dependent, the business mitigates environmental impact by regularly servicing machines to minimise emissions and maintain energy efficiency. Machinery mobility also negates the need for farmers to independently transport large volumes of raw and processed materials to and from the farm, thus mitigating emissions and saving cost and time. A key circular practice is the threshing and dehulling of by-products**.** Residues such as husks and chaff are collected and reused as livestock and poultry feed**,** effectively reducing waste and closing nutrient loops by retaining organic material in the food system. While the business does not directly produce compost, these by-products support local circularity by supplementing animal-based nutrient cycles.

Regarding local inputs, all raw materials (crops) are sourced from surrounding smallholder farmers, ensuring close integration with the local agri-food system. This reduces transport costs and emissions, while strengthening community-based value chain collaboration. Though the business is not directly involved in primary crop production**,** its services contribute indirectly to reducing post-harvest losses by offering timely, efficient threshing, especially for perishable grains like millet and cowpeas. This reduces spoilage and improves product quality and shelf life, with significant benefits for smallholders. There are opportunities to expand agroecological benefits, such as producing compost from chaff, integrating solar-powered machinery to reduce fossil fuel use, and offering residue collection and redistribution services in partnership with livestock farmers. Overall, while still in its growth phase, Trust & Reuben Threshing shows potential to deepen circular practices and environmental sustainability across its value chain.

Inclusion

The management of Trust and Reuben is based on the principles of inclusive and equal ownership, where two men and two women share an equal portion of the company, hence making it a 50% female-owned business. Although the male partners were the driving force in the initial capital mobilisation, the female co-owners are considered equal stakeholders and decision makers, both in strategic and operational decisions, regarding pricing, scheduling, and service delivery priorities. All co-owners are also involved in the CFS project's capacity-building programs on business registration, record-keeping, and business planning, meaning the female owners have access to key entrepreneurial and management skills. On the social front, the business is critical in empowering labour-constrained and female-headed households, particularly by providing low-cost and convenient mobile threshing services that greatly

reduce women's post-harvest labour and time burden. This mechanisation business dignifies and gives agency to resource- or labour-poor households by significantly reducing strenuous drudgery, freeing up time for economic diversification, and increasing income through improved post-harvest efficiency. Such mechanisation assistance also helps women farmers to better thresh their grain and maximise the production of household food. Trust and Reuben enhance equitable access to mechanization by offering mobile, on-demand services that reduce the logistical and time burdens of processing for women, young households, and resource-poor farmers, positioning the venture as a crucial, community-based, and inclusive business within the local agri-food value chain.

Economic, social, and food security benefits of the business

In the past three years, Trust and Reuben have created economic and social impacts in the local agri-food value chain. The enterprise has reinvested profits in acquiring a company-owned van and introducing dehulling in its service portfolio. This has boosted the enterprise's revenue by approximately 15-20 percent as it saved an estimated US$20-50 per trip by not having to hire transport services to make delivery of services to remote and isolated farming communities. Besides providing full-time paid employment to a 30-year-old worker, the enterprise indirectly benefits several smallholder farmers by reducing the post-harvest processing cost and increasing their opportunities to reach the markets. Socially, Trust and Reuben are improving livelihoods by reducing the time and heavy work traditionally needed for manual threshing, a traditional female job; hence an especially important for women-managed households. The addition of the dehulling service also adds to households' food security as the nutritious Samp (partially processed sorghum and millet) is produced, thus increasing the availability of clean, safe, and energy-rich cereals and reducing the time and effort women need to prepare meals. In addition to the direct operation, the enterprise has some positive economic spillovers by demonstrating the viability and feasibility of the mechanised services in rural settings, which encourages business development and promotes inclusive economic development.

Trust & Reuben business getting ready to thresh sorghum (left), the Shelling machine (middle), Trust and Reuben standing next to their Sheller (far right)

Business sustainability and resilience

Trust & Reuben demonstrates strong potential for long-term sustainability, backed by a well-developed business plan that includes financial statements, a SWOT analysis, and clear objectives. The business currently threshes up to 3 tonnes per day, generating as much as $150 per day during peak periods. This covers all operational costs, including partner salaries, and generates a profit. The enterprise serves four wards in the Bubi district, with solid plans to expand its catchment area. Its ability to adapt to local needs, maintain a steady income, and scale operations reflects strong market responsiveness and growing community demand. Looking ahead, Trust & Reuben plans to further expand by purchasing a tractor and diversifying into livestock feed production, using by-products from the threshing process; thereby, increasing value addition and sustainability.

Reflection and learning

One of the main reasons why Trust and Reuben were successful in their establishment was the high level of mutual trust and financial stability between the owners that allowed them to invest in long-lasting threshing and dehulling machines without having to acquire external debt. Their personal farm businesses (production of high-value irrigation crops in the Hauke scheme, i.e., green mealies, sugarcane, and wheat) offered a regular stream of income, which allowed the partners to invest the business profit in growing the business. During its early stages, the business had to deal with the issues of low pulling power when transporting the machinery and poor presence in the market. These challenges were overcome by word-of-mouth marketing and profit reinvestment in buying a van that increased movement and the delivery of services to isolated communities and lowered operational delays and costs of transport that had previously been experienced by hiring cars.

Reflections on CFS project mentorship & support

Mentoring from the CFS project greatly enhanced the business's capacity in management skills**,** including the development of detailed business plans and proper record-keeping. This support helped secure a business license and improved overall professionalism. The guidance shifted how the business approaches planning and operations, fostering a more strategic and growth-oriented mindset.

Case Study 5. Nhlizluc Poultry, Milling & Feed Making Business

(GPS: 35K 734399 7704956)

Background

Nhlizluc PBC, located in Zhampale, Insiza District, is a woman-owned enterprise established in 2022 that specialises in poultry production, including hatchery and rearing, and milling services. The business was independently funded by the owner, who utilised her retirement savings to purchase core assets, including a hatchery, a hammer mill, and various poultry breeds. The business sells day-old chicks and poultry products, direct to customers and restaurants, while also offering milling services for cereal mealie meal, thereby adding value to local crops. Operating within the local food and agricultural value chains, the owner's experience drives continued growth and efficiency. The CFS project provides crucial support through mentorship and capacity building, especially training in business planning and record-keeping, and assisting the business in adopting circularity practices like producing on-farm feed from integrated crop and livestock enterprises to reduce reliance on purchased inputs.

Contribution to circular food systems & agroecology

Nhlizluc PBC uses circularity and agroecology principles. They make smart use of local inputs to reduce waste and keep nutrients cycling on the farm (Figure 10). About 90% of their poultry feed comes from their own production, meaning they have less reliance on outside suppliers. The CFS project introduced Black Soldier Fly production, which has further reduced poultry feed costs. Poultry manure is fermented in water to extract nutrients, and this liquid is applied as organic fertiliser to horticulture plots, boosting soil fertility. Milling by-products, like maize husks, are used as livestock feed and raw material for compost making. Solar panels run the hatchery, significantly reducing fossil fuel use and cost. Their hatchery management keeps things tight, with hatch rates between 80 and 100%. Nhlizluc grows rainfed sorghum, millet, groundnuts, sunflower, and velvet bean using intercropping, crop rotation, and in-field water harvesting. This all helps regenerate the soil, increase yields, and produce their own feed with home-grown crops. These practices are actively transferred o others by setting up demo plots to show drought-resistant sorghum, intercropping systems, and ways to make sustainable feed like urea-treated hay and lick blocks. Farmers nearby learn from Nhlizluc. Nhlizluc representatives attend Innovation Platform meetings and connects with financiers, companies, and feed suppliers. They are always looking for new ways to earn more from the business.

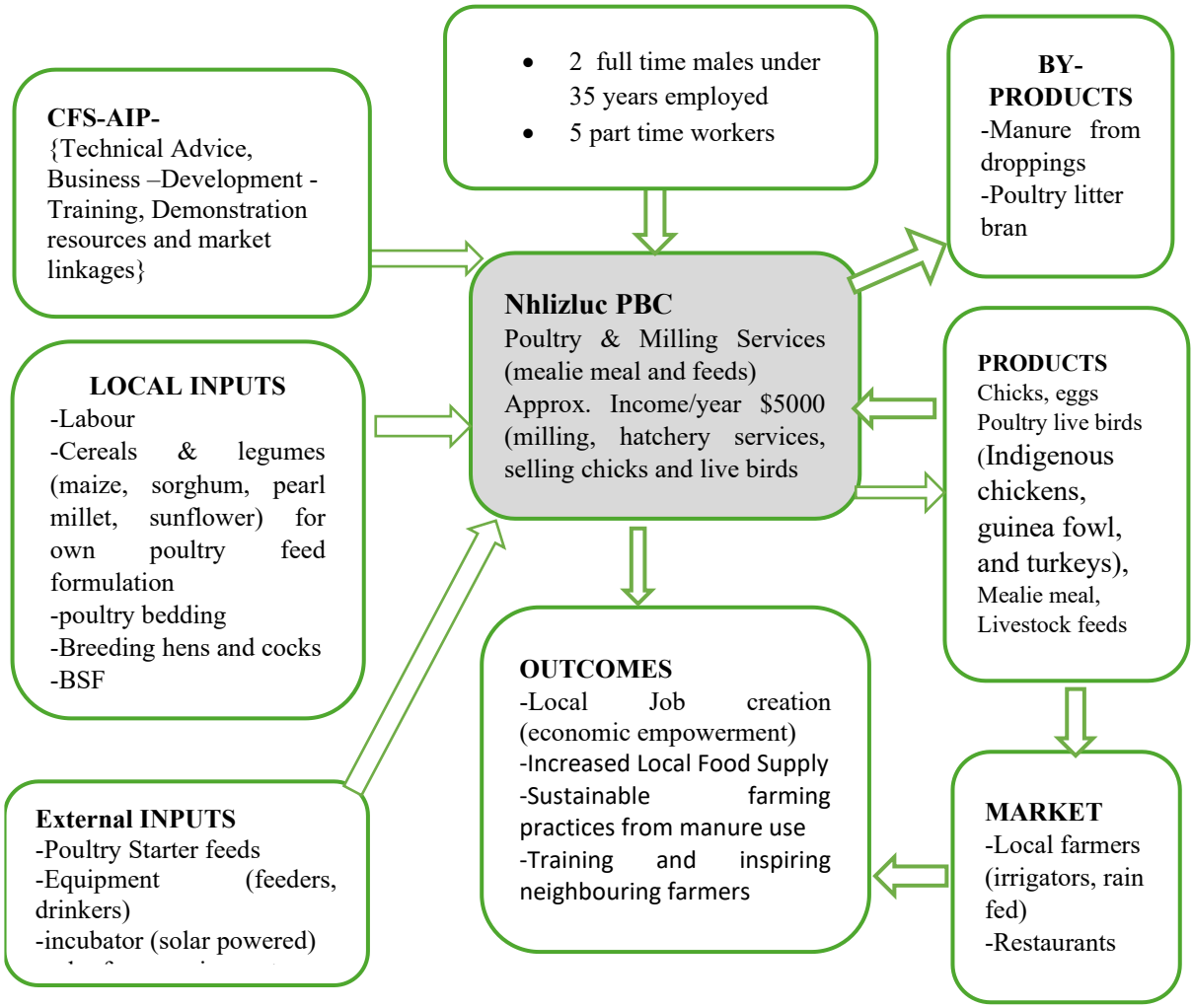

Figure 10. Nhlizluc Poultry, Milling & Feed Making Business

Inclusion

Nhlizluc PBC was founded and is owned by a woman farmer. The owner has become a women champion, a real role model for women in her community, proactively facilitating economic opportunities for other women and youth. The business employs two full-time staff (young men) to support milling and field operations, supplemented by up to five part-time workers (three women, two men) during periods of peak demand. For these local employees, the provision of a dependable, formalised wage represents economic stability. This income enables families, in a vulnerable rural economy, to transition beyond subsistence living and allocate resources toward strategic investments such as education and healthcare. Nhlizluc concurrently functions as a knowledge transfer and resource hub (she is also a lead farmer), actively involving marginalised smallholder farmers with a strong emphasis on women. Participating farmers gain access to essential milling services alongside structured, hands-on technical training in feed production and climate-resilient farming methodologies.

Economic, social, and food security benefits of the business

The business makes a significant contribution to the local economy by creating both full-time and part-time employment. Economically, Nhlizluc fosters local circularity by sourcing approximately 90% of its feed inputs locally. The business minimises operating costs by utilising solar energy and integrating recycled outputs like poultry manure and locally sourced maize stover as inputs into production. This efficient resource use and primary processing (milling) generate approximately $5,000 in annual income through the sale of day-old chicks, eggs, and mature birds, as well as milling and hatchery services. The money is currently being reinvested in the business. Socially, the business significantly enhances livelihoods by providing the local community with an affordable and continuous supply of nutritious food such as eggs and chicken meat (sold as live birds or whole dressed carcasses). This increases food availability and access to essential animal protein, particularly benefiting low-income households, who rely on local markets. The business also creates a positive spill-over effect by sharing knowledge on poultry and feed management with other local farmers, encouraging the replication of sustainable practices.

Nhlizluc Milling grain to produce local chicken feed (left); opening the chick incubator (centre); and feeding growing chickens (right), demonstrating integrated and sustainable poultry production.

Business sustainability and resilience

Nhlizluc PBC shows strong evidence of sustainability, backed by a clear business plan and formal registration. Operations are secure due to a guaranteed water supply from a river and three boreholes, while accurate financial records confirm that the business fully covers operational costs. Crucially, Nhlizluc benefits from strong market demand for its chicks and milled products. The owner is reinvesting profits from poultry and milling into business expansion, which is supported by circularity practices like urea-treated stover and nutrient blocks that reduce external feed reliance. Plans for the future include establishing a vegetable garden using poultry manure, further enhancing resource efficiency, and income diversification.

Reflection and learning

Key factors contributing to the business's success include the availability of the necessary funds to purchase two machines and secure a reliable water supply, complemented by using solar energy for sustainable power. However, challenges such as drought led to livestock destocking and feed shortages, which were addressed by upgrading the water supply system. If given the chance to start again, the business would diversify by incorporating fish production and establishing a fruit orchard to enhance resilience and income streams. Plans focus on expanding production and further strengthening resource sustainability.

Reflections on CFS project mentorship & support

The project provided specialised training in resource-efficient practices, including intercropping, feed crops, feed formulation using urea-treated stover, and nutrient-lick blocks. These alternative feeding techniques reduce reliance on expensive commercial inputs by making locally available materials more digestible and nutritious for livestock. Additionally, training in compost production helps the business recycle organic waste and enhance soil fertility while minimising input costs.

Ms. Lucia in her rainfed sunflower field (left), and her garden irrigated with solar-powered sand abstraction water (right). Sunflower cake from oil pressing and vegetable trimmings are used to feed livestock, while crops are fertilized with manure from poultry and livestock such as cattle and goats - demonstrating a circular and sustainable farming system.

Case Study 6. Hauke Dairy & Mechanisation Services Business

(GPS: 35K 065158 07852958)

Background

Hauke Dairy, located in Hauke Irrigation scheme, Bubi District, was established in 2022 by 78 scheme members to address a severe milk shortage caused by drought and dependence on distant markets. The dairy's formation was strategically supported by an initial asset injection financed through a 30:70 matching grant facility: 30% contributed by the members and 70% secured from a ZRBF NGO project, which funded the purchase of initial stock, coupled with some income generated from tractor tillage services. This provided the necessary financial and infrastructural foundation. The herd, which began with two T-Rex cows (a Viking Red-Tuli cross ideal for harsh conditions) and one bull (Red Dane), now stands at 10 dairy cows. The business currently supplies fresh milk locally and is advancing into primary processing to produce fermented milk (Lacto), focusing on growth and value chain diversification. The CFS project has assisted the business primarily through mentorship and capacity building to enhance both operational and strategic skills. This support includes training in business plan development, financial record keeping, and analysis to help inform better decision-making. Furthermore, the project has actively facilitated attendance at key networking events (such as business expos, trade fairs, and SME conferences) and ensured participation in the Innovation Platform, which enables the business to meet potential partners for finance, market access, and continued growth.

Contribution to circular food systems & agroecology

Hauke Dairy demonstrates strong integration of circularity and agroecology principles through several practical, locally adapted strategies (Figure 11). Over 70% of the feed inputs, such as crop residues from irrigation plots and dryland stover, are sourced locally. This reduces the reliance on commercial feed and minimises trips to procure commercial feed using fossil fuel transport. However, a proportion of commercial feed remains necessary to ensure the animals receive the concentrated protein, minerals, and vitamins required to support high milk production. The efficient use of local resources helps lower input costs and environmental impact. Producing local fresh milk daily eliminates transport-related emissions to bring in milk from outside the community and ensures local food security and reduces the community's dependence on distant towns. The business also supports nutrient cycling by applying cow manure to fertilize irrigation plots, improving soil health and reducing the use of synthetic fertilisers. Some milk is processed into sour milk, reducing waste and spoilage. The dairy currently uses an electric fridge for cooling and storing the milk before selling it. Agroecological practices are evident in the reuse of organic materials (manure used to fertilise crops and the use of crop residues to feed the

cattle), promotion of local employment, and integration of livestock and crop systems. Soil regeneration is supported through the application of manure and compost produced using manure and crop residues, following training provided by the CFS project. Future opportunities to strengthen circularity include expanding into value-added dairy products like yogurt and cheese. Hauke Dairy has functional partnerships with extension services, input suppliers through knowledge exchange facilitated by the Innovation Platform. Through cooperative ownership, local sourcing, and low-waste practices, Hauke Dairy is actively advancing circular agroecological principles.

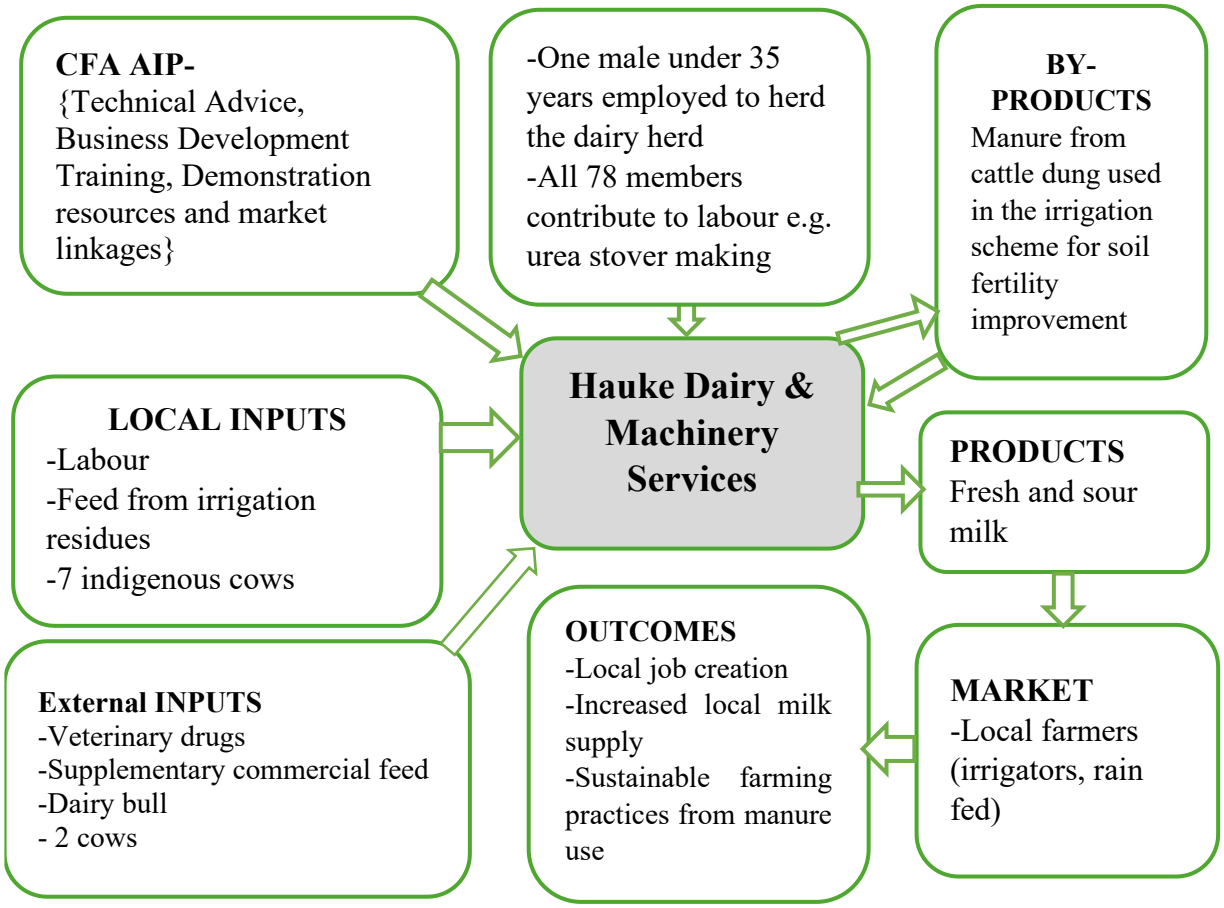

Figure 10:Hauke Dairy & Mechanisation Services

Inclusion

Hauke Dairy is a collectively owned enterprise formed by 78 members of a local irrigation scheme, with approximately 90% men and 10% women. Women members are actively included in leadership roles on the seven-member management committee, which uses consensus-based decision-making, ensuring that women's priorities are part of shaping the cooperative's direction. The enterprise also

includes young members in training, supporting the future sustainability of the business. Inclusion is actively promoted through cooperative employment, which currently includes local youth, with at least one full-time male worker dedicated to herd management. Support from the CFS project has been instrumental in providing all members, particularly women and youth, with the capacity to effectively participate in both operations and governance. Training was provided in business planning, financial record-keeping, and advanced circular agri-business practices, enabling them to manage the cooperative's finances and lead technical decision-making confidently. The collective's success relies on shared ownership and transparent management, which strengthens local economic resilience by equitably distributing profits and risks among all members.

Hauke scheme members preparing urea-treated stover for their dairy cows (left); and milking dairy cows (right). Manure from the dairy is used as Fertiliser in the irrigation scheme, while crop residues are enhanced to feed livestock, illustrating a circular farming system.

Economic, social, and food security benefits of the business

Hauke Dairy contributes to the local economy, social well-being, and food security of its surrounding community. Economically, the business has created at least one full-time job for a local young man to manage and care for the dairy herd. This employment opportunity has positively impacted his livelihood through consistent income. Additionally, the business reinvests its profits into expanding the herd, most recently acquiring two additional cows through proceeds from tractor-hiring services. These investments indicate the business's potential for sustained income generation and growth.

The availability of fresh milk daily has had a direct food security benefit by improving access to affordable, nutritious dairy products within the irrigation community and surrounding households with rainfed-only farming. Earlier, households relied on milk from towns like Bulawayo (185 km away), incurring high transport costs and facing inconsistent supply. Now, locals have convenient access to fresh milk, directly from the irrigator-owned dairy business. Socially, the cooperative model encourages

knowledge sharing among its 78 members, and shared ownership and decision-making, supporting trust and agency and building local economic resilience by ensuring profits are retained and reinvested locally, creating a stable income source, and providing a safety net through collective risk management and purchasing power.

Business sustainability and resilience

Hauke Dairy shows strong potential for long-term sustainability, backed by a detailed business plan, financial projections and profit and loss statements, a break-even analysis, and clear growth objectives. The business has established partnerships with key stakeholders, including local extension officers, veterinary services, and a trained community member who supports herd health and disease control, ensuring both technical guidance and resilience. The business has expanded its milk supply from a single ward to four, with plans to further broaden its catchment area as production increases. The wards include areas with artisanal miners, which helps increase the demand. Currently, demand significantly outstrips supply, with all milk selling out at the farm gate due to low supply, confirming an opportunity for further scaling. Investments, such as the purchase of two pure dairy cows and a bull, demonstrate commitment to scaling operations and strengthening production capacity.

Reflection and learning

The success of Hauke Dairy has been driven by committed leadership, strong government support, and a strategic matching grant from an NGO that provided essential cash flow for start-up. Additional support from TISA, through the provision of water management tools and infrastructure, enabled efficient, year-round crop production and increased profitability by establishing transparent and equitable water allocation, which significantly reduced historic conflicts over sharing and built trust and willingness among scheme members to engage in collective action. The CFS project further strengthened the enterprise's foundation by delivering training in business planning, record-keeping, and alternative livestock feeding techniques. A key lesson from Hauke Dairy's experience is the importance of prioritizing cold chain infrastructure, such as solar-powered refrigeration and proper milking cans, early in the business's development to minimise milk spoilage and maximize profitability.

Reflections on CFS project mentorship & support

The CFS project mentoring has significantly enhanced the Hauke Dairy business, particularly through capacity building in business management, planning, and record-keeping. One of the most impactful areas was the introduction of urea-treated stover as a supplementary feed, which addressed critical feed shortages. The support has reshaped how the business is planned, managed, and scaled.

Tanzania country context

The Tanzanian business approach focused on the identification and development of new businesses through the AIP process (Figure 12). It included two cycles of mobilisation and development. Figure 9 shows the steps in the cycle to identify and then train groups to develop business plans. In Step 2, project staff initiated a participatory process to introduce CFS practices to the community and elicit suggestions of types of new businesses that would have a circularity element and be locally appropriate. The following were identified and confirmed in Step 3: milk collection; poultry; livestock feed; livestock fattening and breed improvement; and rice value addition (Table 3). In the first mobilisation cycle, the emphasis was on identifying people, particularly from underserved groups, to form groups to implement each type of new business. Training, mentoring, business registration and business plan development were then undertaken with the groups.

By Step 9 project staff were sufficiently confident to provide seed-funding to the seedling nursery as this business demonstrated strong viability. This seed-funding was provided as it had been determined that banks would not provide loans for new businesses. Importantly, the pathway to focus on the mobilisation and development of the new seedling business, for example, took approximately 15 months.

The other four business types have undertaken business plan development and received extensive ongoing mentoring. They are at various stages of development with some evolving along a different pathway i.e. as individual rather than group businesses (Table 4). With business plans and improved understanding of what it takes to develop each new business type, the Tanzanian team initiated a second round of mobilisation to identify more people who might engage in the businesses. The development of the dairy business is a point in case. Figure 13 illustrates the complex and challenging process of establishing a milk collection business (see also Table 4). Naserian aimed to secure access to the large ASAS dairy company market by collecting milk locally from community producers and supplying it directly to the company. However, ASAS requires a minimum of 500 litres of milk per delivery to buy the milk and to transport it to the processing plant. Reaching a minimum supply of 1,000 litres, ASAS also installs a cold-storage facility. These requirements formed the basis of the group's initial strategy and influenced their efforts to scale up milk collection. In the process of reaching this threshold the milk market became highly competitive as large-scale buyers purchased most of the available milk. As a result, the individual milk producers became reluctant to commit their milk to Naserian for collectively supply. Consequently, the group decided to temporarily split, with each member working independently to accumulate personal capital.

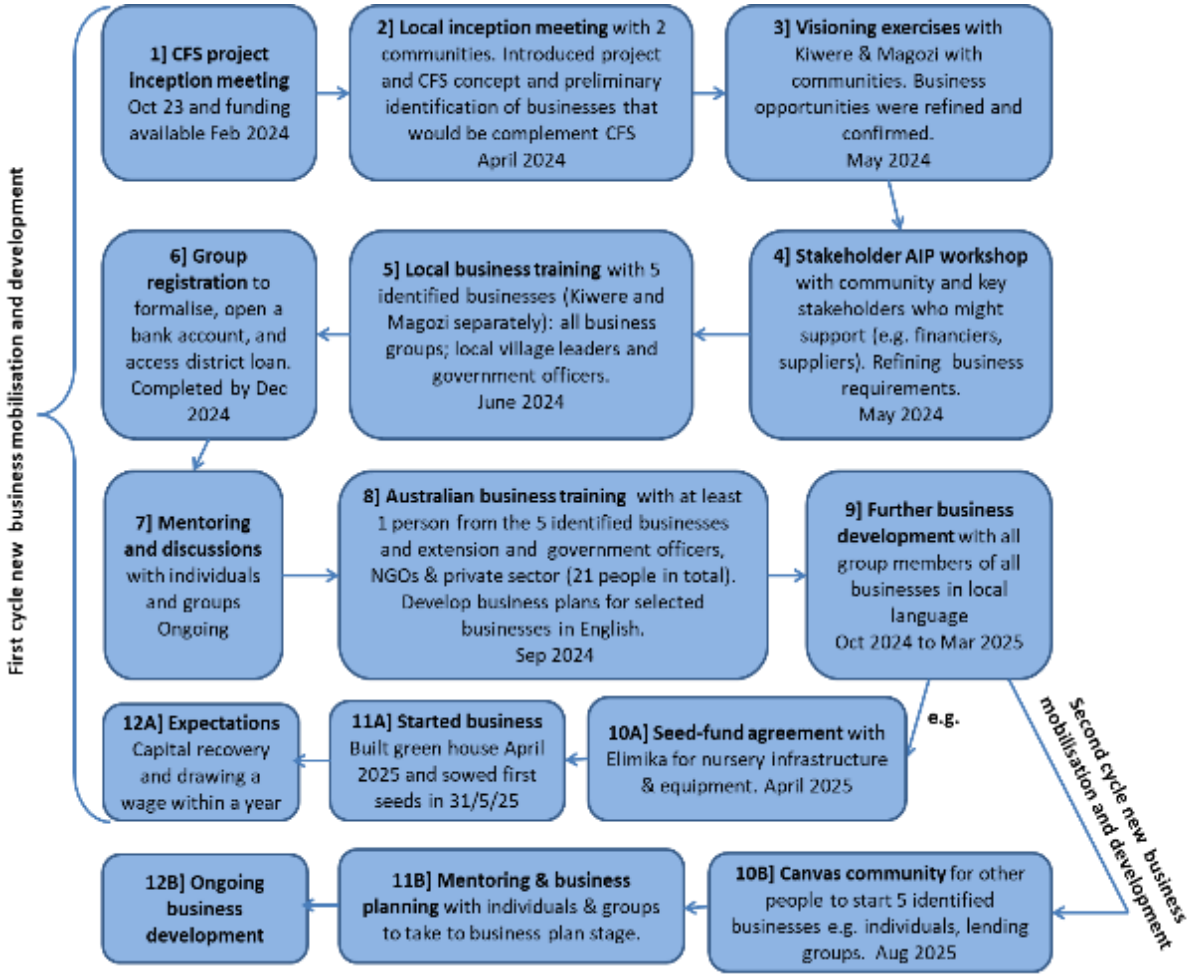

Figure 11: CFS project's process to scope, develop and implement new businesses in Tanzania

The long-term plan, however, remains intact: once members have built sufficient financial capacity, they will regroup and resume the shared goal of reaching the 500-litre threshold through their own cows, while maintaining the CFS principles. Dairy producers have the additional challenge of the development pathway they should follow as they can choose between: focussing on building a herd of local, improved or cross-bred breeds with varying purchase prices and resulting volume and quality; purchasing or collective access to bulls; local taste preferences for milk; and the relative merits of selling direct versus linking with ASAS.

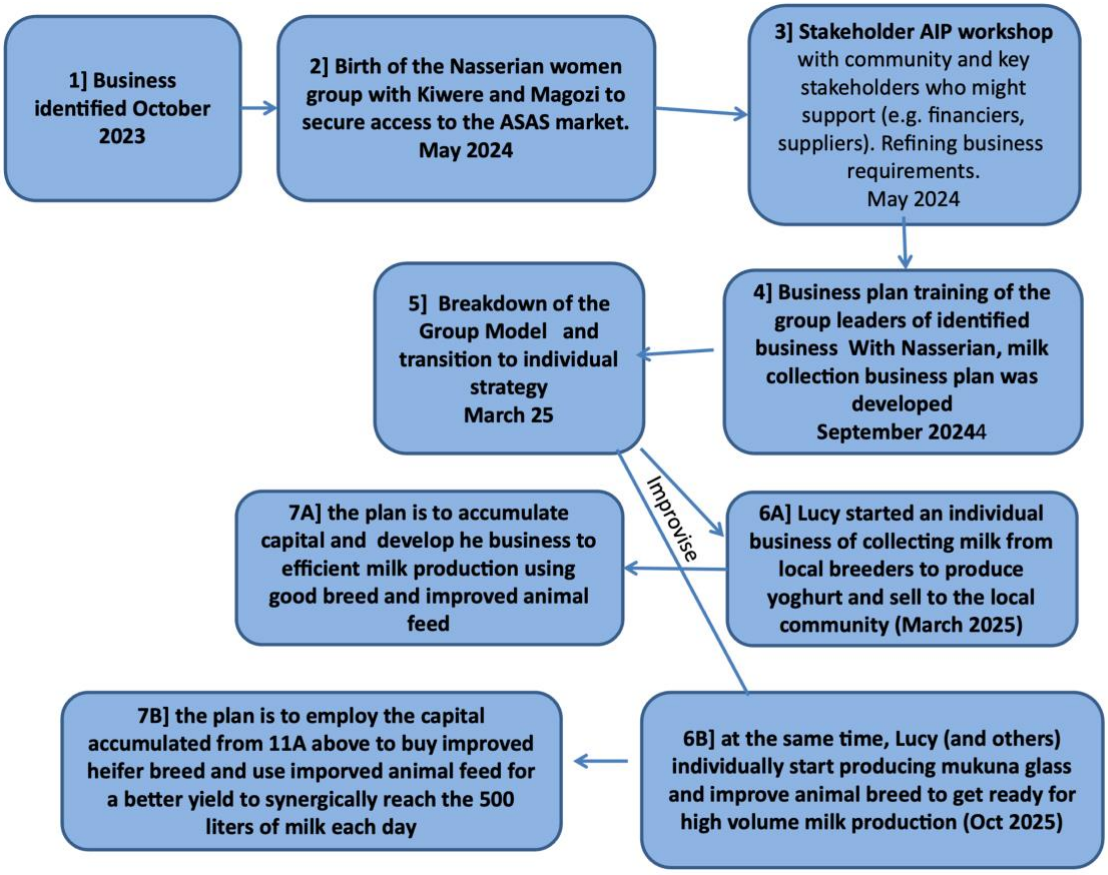

Figure 12:Process of developing the milk business

Considerable learning has been gained in the business development process to date: for example, group formation did not always go as planned; some people expected financial support would be freely given (despite communication otherwise); and some people disengaged. Those engaged has winnowed to those more motivated, likely early adopters, and akin to a process of natural selection. The process illustrates the time frames required to empower a community, build capacity and sufficiently understand the business environment to confidently proceed with implementation

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Table 3:Summary of new and enhanced CFS-supported businesses in Tanzania

#	Business participating	Initial business focus	Circularity elements added		Funding source for new or enhanced components	Key outcomes for business owners	Flow-on outcomes for community
			New business or new component of existing business	Enhanced component of existing business			
Tanzania							
Kiwere & Magozi							
1	Elimika BD; M; CS; R	None	Seedling nursery Demonstration plot for agronomic practices	Transitioning to more local growing medium	Seed-funding for infrastructure and	After 6 months group has saved 70% of seed-funding repayment. New knowledge on seedling production and farming practices. Built good reputation and receiving recognition.	Quality, timely and sufficient seedlings. New agronomic knowledge Group spends in shops in local community and buys inputs locally.
2	Lucy's dairy BD; M; CS	Selling own milk on roadside	Irrigation for improved feed. Pen for improved dairy cow	Milk collection and yoghurt making Sharing a shop to sell milk and yoghurt.	Incremental saving from milk and traditional jewellery businesses	Improved income Empowerment and leadership	Mobilised and encouraged Maasai and other farmers (6) have added on dairy, improved bulls (see table 3)
3	Kapungu BD; M; CS	Poultry (meat) and farming	Diversified into egg production with brown and Sasso layers	70% of feed sourced locally Poultry shed construction uses local materials Manure used on farm	Own funds and NMB Bank (for poultry sheds, fencing, water connection, and employee quarters)	Established a profitable venture backed by partnerships and networking	Employs 2 young people Local supply of quality and cheaper eggs Consistent supply 6 resellers Influenced others to start egg production
4	Hussein BD; M; LF	Maize farming Tri-cycle transporting	Poultry (eggs) Dairy	Manure application on own fields and sells Uses crop residues to feed his dairy cattle and by-products from local	Invests profit from egg production and maize selling into dairy	Increased income from eggs, milk and selling manure. Plans to expand egg and dairy production.	Reliable egg supply for community 4 women and 4 men have adopted milk production, and 4 women have adopted

#	Business participating	Initial business focus	Circularity elements added		Funding source for new or enhanced components	Key outcomes for business owners	Flow-on outcomes for community
			New business or new component of existing business	Enhanced component of existing business			
				maize milling and oil pressing to mix feed for his layers		Increasing maize area farmed to provide more feed for poultry	egg production after seeing Hussein's progress. 20 youth visit him for farming advice

Notes: BD=participation in CFS project business development; M=recovered CFS project mentoring; CS=case study in this or lead farmer report; LF=participated in lead farmer CFS intervention.

Table 4 Summary of how five business types evolved

#	Business participating	Number	Initial business focus	Originated from	Funding sources	Outcomes	Challenges
	Dairy: CFS project intent is to support dairy producers to grow towards sufficient volume to give local producers the opportunity to interact with ASAS as a leading dairy brand in Tanzania. ASAS require 500L/day for ASAS to have a collection point and 1000L/day to establish a staffed collection centre to manage quality. Selling milk to ASAS is not the best return but it provides additional opportunities e.g. access to improved breeds.						
5	Group of individual dairy producers BD; M	15 (includes #2 above) 5 women 2 Maasai 3 aged < 35	3 of the group had local cattle breeds and remainder were not doing dairy.	Informal group with mutual need to share technologies, learn dairy keeping and achieve increased milk volume to improve sales opportunities.	Mostly from irrigated & rainfed farming, government wage (nurse, teacher)	Everyone in the group now has improved breeds and majority have 1-3 cows. In the top season, 11 producers are averaging 10L/day, and 4 are averaging 40-80L/day each. Most producers have engaged: 1 young person to care for cows; young people to cut stover and cart residues; and young milk transporters. Other in the community are closely observing the new group of dairy farmers to see their outcomes, particularly the market for milk, management of improved breeds such as	Takes time and significant investment to build milk volume Complex dairy improvement pathways with various risks and outcomes Securing customers until goal volume is attained

#	Business participating	Number	Initial business focus	Originated from	Funding sources	Outcomes	Challenges
						shedding and high-quality feed and the best production pathway. Anticipated longer term outcomes: secure and stable supply of milk and secure income	
	Poultry: CFS project intent is to build poultry production with locally sourced and mixed feed that is supplemented with Black Soldier Flies (BSF)						
6	Kuku ni mali	Women's group of 8 7 aged <35	Not engaged in poultry at beginning of project. Business plan developed for incubator and chick production.	Identified in AIP process and group were part of business planning and mentoring	Individual contributions but insufficient to buy incubator. Ineligible for a district loan as some group members had previously received a loan	Group experienced challenges and are re-grouping and reassessing. They will start with buying chicks to grow on and then move into selling chicks. Project has subsequently identified an incubator lying idle that could be leased.	Chair had employment opportunities elsewhere (people with education can be less reliable as they have more options and are not settled). Need to re-work leadership structure. Need to find a new area for poultry sheds independent of Chair. Money management a challenge and now pushing group to open mobile money.
7	Upendo Magozi savings and lending group (SLG) (higher end of savings)	12 1 aged <35 11 aged 36-40	Not engaged in poultry at beginning of project.	Identified during 2nd cycle of mobilisation Identified an area, have cost breakdown (mentored by Kapunga) mobilised half capital required	Through individual contributions through SLG group have raised half the capital required. CFS project will provide supplementary seed-fund when	Initial raising of capital and mentoring from Kapunga (#3 above, 1st cycle of mobilisation) Anticipated outcomes: Group registration to enable opening bank account and applying for district loans Will have training on BSF, poultry management & feed production. Will first grow on chicks and move into egg production	Will lease a shed but as they grow will need to find another arrangement An area needs to be secure, small to start with, solid shed for poultry

#	Business participating	Number	Initial business focus	Originated from	Funding sources	Outcomes	Challenges
					confident group is ready. Will apply for district loan in the future	Egg production will be from Sasso chickens (eggs command higher prices, big size for meat, range outside, cross easily with local breeds).	
8	Black soldier fly	6/7 SLGs per community plus selected individuals	Groups not previously engaged in BSF Individuals selected are already doing poultry)	Identified during 2nd cycle of mobilisation	2 groups will get BSF equipment for ongoing Note: SLGs are medium-range savings contribution groups	Anticipated outcomes: Mentor from Iringa will provide initial equipment (basic equipment using local materials) Mentor will provide training on BSF and feed mix, set up BSF demonstration spaces in Kiwere (Upendo) and Magozi, and demonstrate pellet making (Dec 25)	Needs attention and need to be committed
	Rice CFS project intent was to support processing, packaging and branding of rice. After protracted feasibility assessment it was found that competition from other rice buyers who were packaging rice and limited local demand for packaged rice (in Iringa customers can choose to buy loose rice at a lower price) meant the intended value adding was not feasible.						
	Livestock feed: This business was originally conceived as group business for youth to process feed for poultry from milling and oil pressing by-products. Also, processing stover as silage (wrapped in small bales for easy handling) or chopped material. However, the equipment costs were prohibitive. Further, the demand for feed was very high and big buyers from Iringa purchased all available stower. The project pivoted to instead mobilise individuals with livestock, as would have the most incentive to produce improved feed.						
9	Individual livestock keepers	Lead farmers (20 across K& M) plus other individuals (80) Plus from nearby area (~40)	Demo plots (each community) with super Napier Mucuna, urea treated stover, lick blocks	Business identified through AIP	Individual savings, income from farming and selling cattle, goats and sheep	2 people have started 4-acre plots of super Napier for silage production. Seed multiplication for Mucuna – 210kg of seed were produced in the 2024/25 farming season. One needs 40kg/ha Found better to be done by individuals as its need patience and time to realize the profit	

#	Business participating	Number	Initial business focus	Originated from	Funding sources	Outcomes	Challenges
	Livestock fattening and breed improvement:						
10	Lead farmer intervention		Livestock fattening & improvements (AIP)	Business identified in AIP	Individual savings from farming income	Instead of waiting for group funding from financial institutions, individuals' farmers are now mobilizing their resources to implement the business at a low scale. Example individual farmers have started to make changes by buying improved bulls to introduce in their herds to improve their local cattle breeds (more meat and milk).	Other farmers have added on to their farming It takes approximately 4 years to get improved breeds from local breeds

Note: BD=business development support, LF=lead farmer; CS=has a case study write-up; R=formally registered; M=received additional mentoring.

The Tanzania case studies indicate that the elements of an interactive network of related businesses exists (Figure 14) that provides an overall boost to localised circular food systems through complementary input-output associations, knowledge sharing, and ecosystem management. The use of local resources (crops, by-products and waste) as the basis for sustainable agribusinesses is shown through the example of the poultry business of Innocent Kapungu. His mixing of maize, rice, and sunflower residues in poultry food, as well as recycling of manure to fertilize crops, forms a self-sustaining cycle of nutrient and materials. Sharing manure with neighbours can address two problems, the farmer needs to get rid of surplus manure, and the neighbour has a problem accessing manure to improve his soil structure.

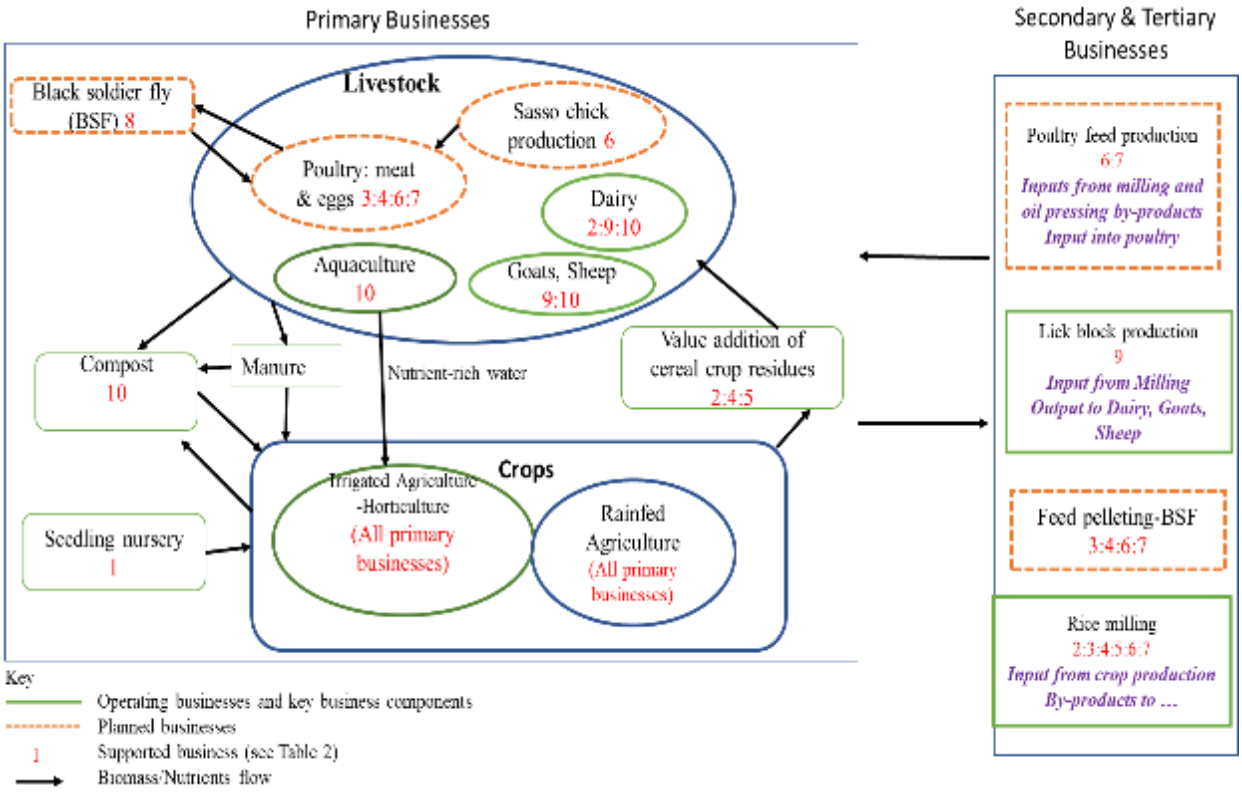

Figure 13:The Tanzania CFS System

Elimika youth seedling nursery supplements livestock-crop linkages, for example, through increasing the input efficiency and lowering risk through the entire horticulture value chain. Their nursery delivers locally grown seedlings of the farmers' preferred varieties at the farmers' estimated planting date. This maximises seedling transplantation success and improves crop productivity. Their growing media is locally produced, and the seed trays are reused, which reduces wastage. Agroecological knowledge flows and collective resilience are enhanced by the cooperation between the surrounding farmers and Elimika, including training, demonstration plots, as well as shared problem-solving.

The dairy business by Lucy Majele has even more aspects of circularity, as it connects the nutrient streams of livestock with value addition on a community level. Her cattle manure is used as supplemental fertiliser in her maize plots and as a building material. That locally grown calabash containers, reused bottles, and shared transportation networks are used underscores the fact that the system is low-waste and resource-efficient. The business model of Lucy, which is based on local inputs, cooperation of women, and step-by-step value addition, exemplifies the way dairy can be both an economic and a social bridge to the rural food systems.

Combined, these enterprises make up a network of processes that potentially complement each other: poultry and dairy enterprises supply manure and organic matter to crops, the nursery guarantees a constant supply and high-quality seedlings for crop production, and crop residues feed poultry and livestock. Simultaneously, the exchange of knowledge and material between farmers, with the help of the CFS project, improves the adaptive capacity, financial inclusion, networking, and social cohesion. This interdependence results in a localised circular economy, where waste is a source of input, competition is replaced by cooperation, and productivity takes the form of ecological balance and common innovation.

Case Study 7. Lucy's Dairy Business

(Latitude: 7°37'24" S, Longitude: 35°34'23" E)

Background

Lucy Majele operates a dairy business 25 km west of Kiwere Village, Iringa District, where her herd of five Zebu cows graze across the gently undulating rangelands surrounding her Maasai homestead. The business currently comprises milk collection and the sale of fresh milk and yoghurt, which she either sells in Kiwere or directly to customers, who buy directly from her homestead. Lucy is the sole business owner and was inspired to start her business after participating in an Agricultural Innovation Platform (AIP) visioning exercise as part of the CFS project. From this, she saw an opportunity for her community to switch from local women selling separately, through time-consuming roadside sales, to purchasing milk from neighbours and value adding. Lucy has not received funding for her business, but is expanding through practical, realistic, and incremental change. The motivation, business knowledge, mentoring, and new networks she gained through the CFS project have underpinned her progress.

Contribution to circular food systems & agroecology

Naturally and by necessity, Lucy's business incorporates many circularity and agroecological principles (Figure 15). The main input, livestock feed, is locally sourced, and milk is transported by Maasai neighbours in locally grown calabash or sold in reused plastic bottles. The penning of cattle allows manure to be collected and used to improve soil fertility for the maize crop. The manure is also used as material for housing and other small buildings, such as livestock pens, with maize crop residues used to supplement feed for the herd.

After learning from CFS project workshops and receiving mentoring from project staff, she developed a business mindset, initiated yoghurt processing, expanded milk sales, created a business plan, and identified further opportunities. Lucy plans to diversify her livestock feed and buy a dairy cow of an improved breed, but she must first provide the extra care that improved breeds require by building a shed and producing Super Napier grass. To do that, she plans to rent a one-acre plot at low cost from a relative on a nearby irrigation scheme. Lucy will be the first Maasai in her community to engage in irrigated cropping.

Lucy maintains regular contact with CFS project mentors, establishing a valuable two-way knowledge exchange on opportunities and challenges associated with dairy development in a Maasai community. Through the development of a milk collection business plan, Lucy established a network of like-minded dairy producers to do milk collection; currently, about six families are making and selling yogurt. She

also collaborates along the value chain, creating or maintaining relationships with neighbours supplying milk, transporters, and on sellers of her products, and direct customers. She plans to hire a sale space in Kiwere jointly with another business owner. These positive, and reinforcing networks, are vital for motivation, when her own community says that her ideas are too difficult.

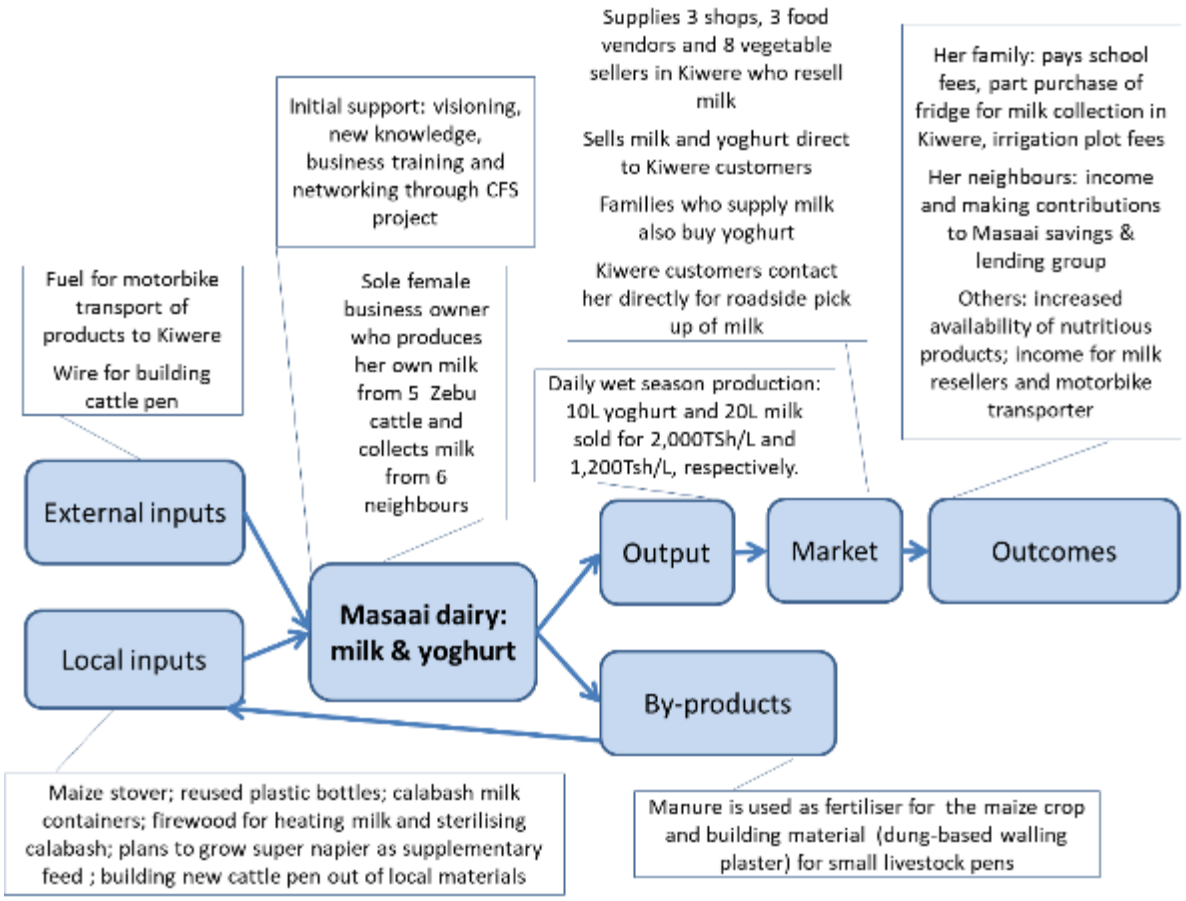

Figure 14:Maasai dairy value chain

Energy sources include petrol for motorbike transport and firewood, which is plentiful in the Maasai landscape and serves as fuel to heat the milk, with charcoal ground inside the calabash acting as a sterilising agent.

Inclusion

Lucy does not believe that being a woman is a barrier per se, but participation in CFS activities has not been without challenge. On the one hand, it is the role of men in her community to make decisions about cattle, such as adding on dairying or introducing new breeds, with many men preferring their livestock “not be touched”. On the other hand, the power is with women for change and improvement, and milk is women’s business.

Lucy explained that she had many ideas "inside her" before joining the project, and that her community trusted her judgment, believing that if Lucy was involved, any decision would be the right one. The CFS project gave her a platform to put her ideas into practice and seize opportunities. Presenting in focus group discussions was an empowering experience. Previously, she would not have stood up in front of people, but she now says she would stand up in front of 100 Maasai. Since this time and with additional knowledge from the CFS project, she is confident to practice what she has learnt, happy to mobilise her community, and her ideas are usually received positively. However, putting ideas into practice successfully remains the key, and it is not always assured.

Economic, social, and food security benefits of the business

Lucy's dairy business started in March 2025. At that time, she was selling an average of 5L of milk per day to passer-byes on the roadside. The volume of milk grew to 10L and then 30L in the wet season. She gets milk from five cows she owns (together with her husband) and supplements this by collecting additional milk from neighbours in the community. She buys milk for 1,000 Tsh/L, which she sells for 1,200 Tsh/L and 2,000 Tsh/L for yoghurt. Financially, she makes a profit.

The profit has allowed her to build a washroom, purchase a goat, and meet family needs, such as paying school fees and buying household utensils. Like other women in her community, she is also part of a Maasai savings and lending group. As such, her profit allows her to make savings contributions, so that she can take a small loan to support either her dairy or Maasai jewellery businesses.

Her community mobilisation has included encouraging her women neighbours to sell to her, rather than them competing and selling separately on the roadside. She recognises that she needs to buy every day, so they don't sell elsewhere. Her neighbours realise similar household improvements and invest in savings and lending groups. Lucy is encouraging them to consider poultry as additional income. Her value chain also includes extra work for a young male motorbike transporter and a reselling opportunity for at least eight women in Kiwere. Food security benefits are two-fold: a direct benefit in terms of greater availability of milk and yogurt in the Kiwere community, and the less direct benefit of increased income for households along Lucy's value chain.

Sterilising the calabash (left), Pouring milk from the calabash (middle), and Lucy marketing her products at an event in the village (right)

Business sustainability and resilience

The plan for a 500L milk collection centre has not come to fruition, as there is insufficient local milk. Motivation from fellow CFS project participants advising her "it is you who decides if you make a profit", has helped her realise that small, realistic steps can support sustainable expansion and diversification. Customers enjoy local milk; it has good taste and is undiluted and safer and demand for her products is often unmet. She is halfway through buying a fridge for collecting milk, and by growing supplementary feed, the milk volume will increase. To have a visible location, she is co-leasing space in Kiwere with a honey business owner.

Reflection and learning

The heartbreaking words Lucy sometimes receives from her local community that her ideas are impossible have spurred her to pursue her business with passion. She realises she could have made more yoghurt sooner to avoid milk spoilage. Further, she now knows she can start with just a few suppliers, inspiring others over time.

Reflections on CFS project mentorship & support

Lucy will grow Super Napier grass after seeing the CFS demonstration plots. Business planning, entrepreneurship guidance, and mentoring have given her confidence, helped her solve problems, and opened doors. She knows change starts from the heart, and she is ready to "dare to do".

Case Study 8. Elimika Seedling Nursery Business

(Latitude: 7°40'57" S, Longitude: 35°36'14" E)

Background

The Elimika Seedling Nursery, located in Mgera Village, Kiwere Ward, Iringa District, was established in April 2025 by a youth group named *Elimika*, meaning "be educated." This opportunity surfaced through the CFS project's AIP visioning, as local farmers were sourcing seedlings from Iringa. Young AIP-attendees selected this business, formed a group, and received business training. To establish their enterprise and build a greenhouse with basic equipment, the group accessed a seed funding from the CFS project (about 5 million Tsh), a Starter Seed Kit from Bayer Crop Science (valued at about 2 million Tsh), and mentorship from an agri-consultant on raising healthy seedlings After refining their business plan, the group registered with the District Council, at their own cost. In their first 3 months, Elimika sold 98,200 seedlings, valued at 9,820,000 Tsh, equivalent to 4.9 hectares of planting, and has established a demonstration plot and made continuous improvements. The business has plans to expand the nursery as demand is high from surrounding scheme farmers. Their success so far is to be commended, as youth group projects in rural areas face many challenges and often fail.

Contribution to circular food systems & agroecology

By necessity, the nursery started with many external inputs, but it is gradually reducing this dependence, which reflects a shift towards local resource use (Figure 16). Seeds, pesticides, and fertiliser are now sourced from local agro-dealers, supporting local supply chains and enabling credit purchases. Having a quality, disease-free growing medium is vital for seedling production. The group is transitioning from an Israeli product to a locally adapted Tanzanian mix, carefully maintaining high seedling quality. The new mix is processed locally and with training, the group could produce a mix themselves. There are currently no by-products, as under-par seedlings are planted by the group, and trays are reused in production.

Seedling quality is superior to what farmers can grow themselves or source from Iringa, which significantly reduces farmers' risk. Seedlings can be ordered to suit specific planting days; they have strong root growth, and transplant more successfully. Unlike in the past, farmers can be assured of having enough seedlings to fill their plot, using resources more efficiently. The nursery business has strong collaboration and knowledge exchange with farmers: Elimika members are farmers themselves; local farmers have recognised the quality of the product; extension officers bring people to learn from Elimika; and everyone is learning from the demonstration plot. The plot was established to showcase seedlings and educate on varieties, spacing, row distance, manure and mulch use (from local sources),

crop support structures, and pest management. One of the early buyers of many seedlings is now using manure in his plots, and Elimika has seen changes in practices among other farmers.

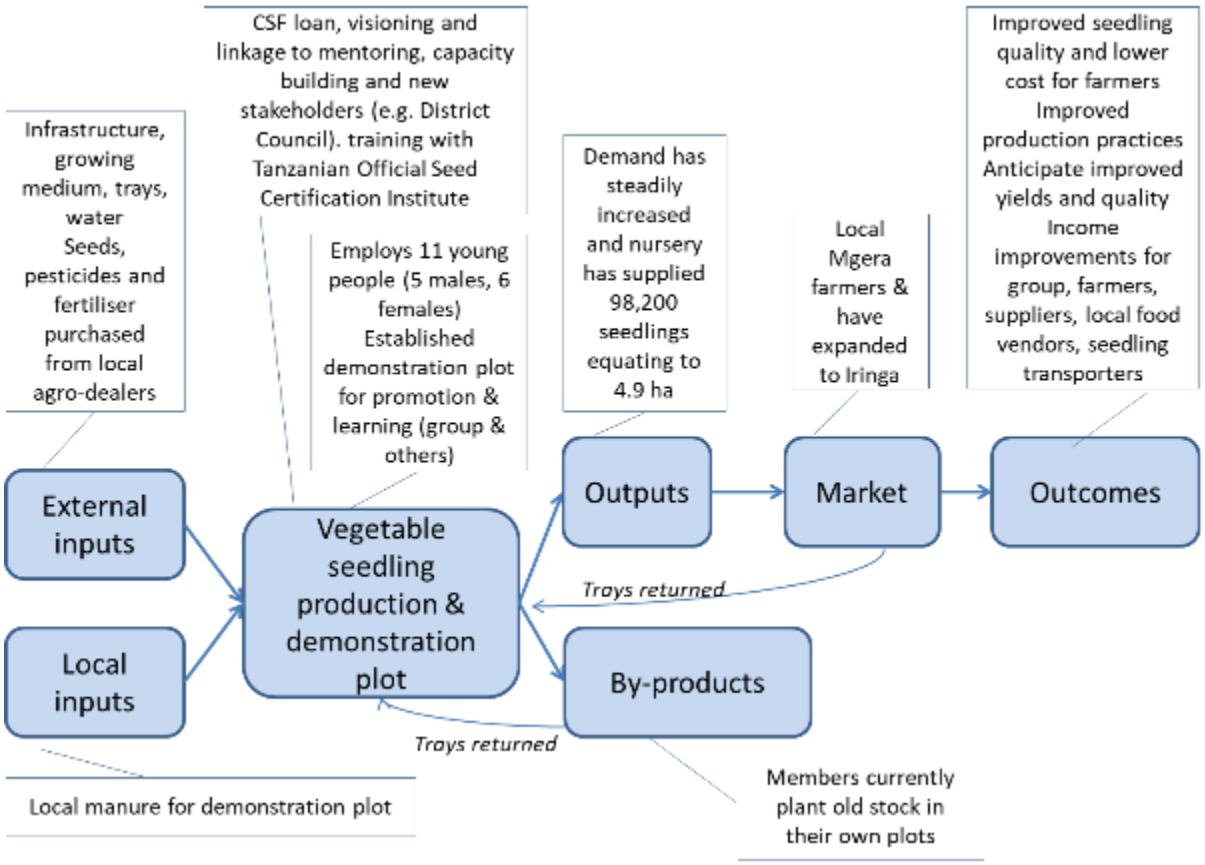

Figure 15: Seedling nursery value chain

Inclusion

Elimika includes 11 young farmers, comprising 5 females and 6 males. The nursery was considered a good match for a youth group, as land access for new businesses can be difficult. While some members, particularly the women, have struggled to make monetary contributions, the group has a mindset to help each other and find solutions to challenges. Group cohesion is not something they take for granted, with unity and mutual social support vital for effective group management. Further, the business needs to benefit them all as it expands, and they plan to help each other have their own individual income-generating businesses.

Group members have experienced many positive changes: participation in seminars that they would not otherwise have attended; confidence to produce quality seedlings, surpassing the need for mentoring; and connections to a wider range of stakeholders, who provide new ideas and knowledge. The group members, who are also farming, now have quality seedlings that they can buy on credit, are more confident, and have improved production on their own plots, which is beneficial for their families. One

young woman explained that she could now do something beneficial for herself and her family rather than being 'idle' and doing only family duties.

The group is now recognised by the district council, and members feel proud to be managing a business that some people thought was not possible.

Economic, social, and food security benefits of the business

Elimika is making a profit, helped by their dual price structure: 20,000Tsh/tray using purchased seeds and 5,000Tsh/tray using farmers' own seeds. Many farmers prefer the latter, as it is more affordable and they get their preferred varieties. Recognising space limitations and the importance of maintaining sufficient income, 75% is allocated to growing purchased seed and 25% for farmers' own seeds. Input supply changes have yielded several economic benefits. Buying locally rather than from Iringa has reduced farmers' seedling transportation costs from 30,000 to 5,000 Tsh. The lower cost of the new growing medium increases the profits to 430,000Tsh from 360,000 Tsh. Visually, the new mix is darker, potentially indicating higher organic matter, and seedlings grow faster. A small downside is that water retention is lower, though this may be an advantage in cooler months.

In addition to group sales, group members realise individual economic gain through improved production on their own plots and greater ability to support their own families. This will be further increased when they support each other to start new individual business activities. Surplus tomatoes from the demonstration plot have created an opportunity for value adding and producing sweet chilli sauce, which will further increase income.

Farmers praise Elimika's business as it provides them with strong seedlings of their preferred varieties, delivered at the scheme at their optimal stage and at their planned planting dates. In addition, Elimika has a demonstration plot and offers supportive services that include in-field visits. In the past, farmers were growing twice as many seedlings to have sufficient healthy plants. The convenient location of the nursery offers economic benefits: farmers can easily drop in to pick up seedlings and look at the demonstration plot, and transport to the farm is shorter and, therefore, produces less damage. Elimika benefits local businesses when they buy from agro-dealers and purchase from food vendors near the nursery. Farmers also pay young motorcycle transporters to carry their seedlings to their farm.

Business sustainability and resilience

Elimika has key management processes in place: a business plan; registration with the District Council to access loans; a constitution guiding group operation; and a bank account with savings of 550,000Tsh. Demand for seedlings exceeds what the nursery can supply, with 5,700 and 61,400 sold in May and

August, respectively, and the peak season yet to arrive. Their customer base has expanded from local Kiwere farmers to supplying seedlings to Iringa. Elimika is on track to refund the CFS project loan, and they have plans to expand the nursery, diversify products, install a watering system, and purchase their own site within 3 years.

A full greenhouse with seedlings in August 2025 and prior to the peak season (left); filling trays and sowing seeds (centre); and watering tomatoes at the demonstration plot (right).

Reflection and learning

- Capital from the CFS project and registration with the District Council to access district loans for expansion.
- Demand for seedlings, AIP participation, and a range of capacity-building activities.
- Group trust, working rules and unity, not being discouraged, and having a 'dare to try' mindset; and
- Looking back, they would build a bigger greenhouse and a smaller demonstration plot.

Reflections on CFS project mentorship & support

Capital, business planning, and networking initiated through the CFS project have underpinned progress. From this, mentoring on seedling production and group management has ensured they produce quality seedlings and know the importance of saving and keeping records. Monitoring by the CFS project has helped keep them on track.

Case Study 9. Kapungu Poultry Business

(Latitude: 7°27'14" S, Longitude: 35°28'43" E)

Background

Located in Ilolo Mpya Ward, Iringa District, this poultry business, owned by 39-year-old Innocent Kapungu, specialises in raising brown and Sasso layers for commercial egg production and sales of off-layer birds. Innocent's participation in TISA's AIP and CFS business training highlighted new opportunities and established networks with financial institutions. Seeing persistent egg shortages in the community, he capitalised on a gap in local egg production from improved breeds. In 2016, Innocent received training, 20 one-day-old chicks, and feed through an NGO livelihood initiative, and he diversified to add egg production to his farming and extension officer work.

After expanding production, he obtained a loan from NMB Bank, which covered the construction of poultry sheds, fencing, water connection, and employee quarters. Building on TISA, CFS, and earlier college training, Innocent now has 400 layers producing approximately 290 eggs daily. There is strong customer confidence in the product and demand consistently exceeds supply.

Contribution to circular food systems & agroecology

The business integrates several circular practices that align with agroecological principles and contributes to a more sustainable local food system (Figure 17). A key feature is the reuse of agricultural by-products with more than 70% of feed sourced locally: sunflower cake, and rice, and maize residues are repurposed as poultry feed, while rice straw and husks are used for roofing and bedding material in the poultry houses. Use of these materials, together with locally available timber, has reduced construction costs to 1.34 million Tsh, compared to 6 million Tsh using bricks and iron sheets. These adaptations reduce waste, lower production costs, and improve the durability and thermal insulation of the housing, while rooting the enterprise within the local agricultural economy.

Poultry manure is applied directly to the farmers' own field for maize and vegetables and supplied free to neighbours as part of maintaining good relations. This practice improves soil health and reduces dependence on synthetic fertilisers; thereby enhancing nutrient cycling and supporting long-term soil fertility. Other inputs are externally sourced from Iringa, such as chicks from a certified supplier, mineral supplements, veterinary products, supplementary feed, and feeders.

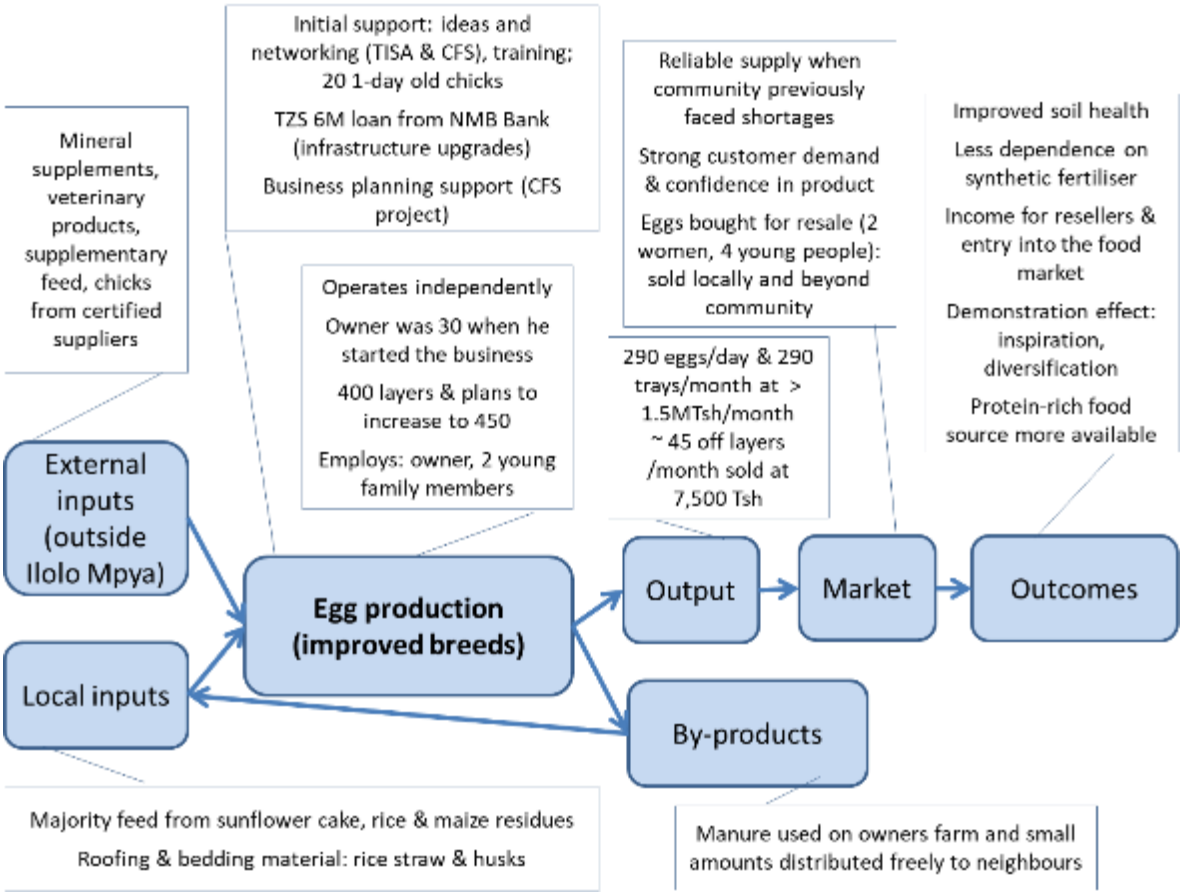

Figure 16:Egg production value chain

In this business, Innocent realizes environmental benefits through reduced waste, lower chemical inputs, and improved soil structure. Innocent and his neighbours benefit from organic fertilisers, which contributes to broader landscape-level soil improvement. This collaboration reinforces linkages within the local food system and builds trust among farmers. The business model reflects a closed-loop approach in which crop residues feed poultry, poultry waste enriches soils, and locally sourced materials are continually cycled back into production. Through these practices, the enterprise contributes to sustainable resource use and enhances climate resilience, particularly by reducing external input reliance and promoting low-waste, adaptive farming strategies tailored to the region's agroecological context.

Inclusion

The business plays a role in supporting inclusion and informal economic participation, particularly among youth and women from the adjacent Magozi village. Innocent is an example of a successful young entrepreneur, employing two young male family members. Two women and four young people regularly buy most of Innocent's eggs for 8,000 Tsh a tray, which they resell in the local market for 9,000 Tsh per tray. This arrangement provides them with a consistent product to trade and an entry

point into local food markets, which contributes to their economic independence. The resale activity has strengthened their agency within their household and in community-level economic interactions. Some have expanded their market outside the Ward, further increasing their income-generating potential.

At a broader level, the visibility of the business has sparked interest among other youth and women's groups in the community, some of whom are now considering starting similar ventures. This is particularly promising as Innocent provides free extension services to youth and women, demonstrating the potential for small-scale enterprises to serve as informal models of livelihood diversification and social inspiration within the community.

Economic, social, and food security benefits

The poultry business has grown into a profitable venture, producing 190 trays of eggs/month, which sell for 8,000 Tsh/tray. By supplying eggs locally, there is less reliance on imports from Iringa, cutting transport costs and minimising losses from breakage. This sustains the business directly and offers better quality and cheaper egg supply for local resellers and community members. The business also provides employment for two young family members, supporting job creation and youth engagement in agriculture.

Socially, the business generates income opportunities and improves access to agricultural inputs. Poultry manure is used on the business owner's own field and is shared with local vegetable farmers, enhancing soil fertility and indirectly improving household food production. The business generates $24m^3$ of bedding manure annually, which is valued at 900,000 Tsh. When applied to the farmer's one-acre maize plot, this organic input reduces fertiliser requirements by 50%, saving 70,000 Tsh. Surplus will be sold in the future.

The initiative has also had a demonstration effect, encouraging a group of community members to consider a layer poultry enterprise and indicating the business's wider influence on local entrepreneurial aspirations and skill development. In terms of food security, the business has improved access to affordable, protein-rich food in Ilolo Mpya and the surrounding areas. Daily egg production contributes to households' dietary diversity, making a nutrient-rich food consistently more accessible and affordable to low-income households.

Feeding the layers (left); collecting eggs (centre); and poultry housing thatched with rice straw (right).

Business sustainability and resilience

A business plan is being implemented, which was developed through the CFS project and will guide future growth and diversification in the value chain. Strategies include increasing production to 450 layers, securing reliable labour, adding maize production to provide more feed, and investing in improved infrastructure to reduce pest and disease risks.

The business uses local feed ingredients to reduce risk from supply chain disruptions. The enterprise has consistent output and availability, has consumer confidence, is financially viable, and all production is sold, indicating untapped demand. While initial support includes training and start-up inputs, the loan has been repaid, and business profits have been reinvested in infrastructure upgrades and positioning the business for self-sustained expansion.

Reflections and learnings

Innocent reflects: “Success stemmed from my passion, access to financial support through a loan, technical knowledge, and partnerships with various organizations.” Responding to a clear local demand for eggs was key to establishing the business. Starting over, Innocent would improve the chicken housing and have a clearer strategy to expand the business and employ more youth.

Reflections on CFS project mentorship & support

The TISA and CFS projects helped identify opportunities and provided diverse networking, including with financial institutions. Further mentoring highlighted the critical role of consistent record keeping for tracking performance, demonstrating viability, and, thereby, accessing future support. Admitting that he stopped record-keeping after receiving the loan, this guidance has reshaped his approach, and he now takes a more structured and informed path toward sustainable business growth.

Circular Business Case Studies from Mozambique

Mozambique country context

Implementation of the CFS project in Mozambique commenced later than in the other two countries; however, most activities have been completed. Circular food system principles are being practiced by farmers in the target communities, although their implementation is still limited. There is strong potential to enhance current practices, such as producing compost and vermicompost, using poultry and pig manure more intensively, and promoting crop residues as animal feed. These activities showcase opportunities for circularity and value addition across agricultural production and small-scale livestock processing, where by-products are transformed into inputs or marketable goods that reinforce sustainability and diversify income streams.

The three case studies in this report demonstrate how smallholder-based enterprises in Mozambique are embracing the principles of circularity and agroecology (Figure 18, Table 5). These businesses illustrate how combining production, processing, and value addition can generate self-reinforcing cycles of resource efficiency and environmental renewal. Examples include Farmer X's diversified agribusiness that integrates maize, poultry, pigs, and goats with processing and retailing of mealie meal, peanut products, and poultry meat. Milling by-products and livestock manure fertilize soils, while animals are partially fed from on farm food, creating an internal cyclical system that minimizes waste and maximizes output. Mr Julio's horticulture and piggery enterprise combines crop and livestock production, where crop residues and kitchen scraps feed pigs, and pig manure supports cabbage production and potential biogas generation. This reduces feed costs, manages nutrients, and creates sustainable energy options. Also, Daniel Mathe's horticulture and apiary business integrates pollination services with organic honey production. His bees rely on flowering crops in irrigated plots, boosting horticultural yields and biodiversity. By products such as wax are reused or sold, strengthening circularity and economic diversification. Furthermore, Table 6 presents a total of 39 additional business plans developed by the project, with the majority focused on crop production (23), followed by chicken and ducks (11), fishery (3), and pork (2). These small businesses are being supported by the CFS project in the process of accessing finance and to operationalizing their plans.

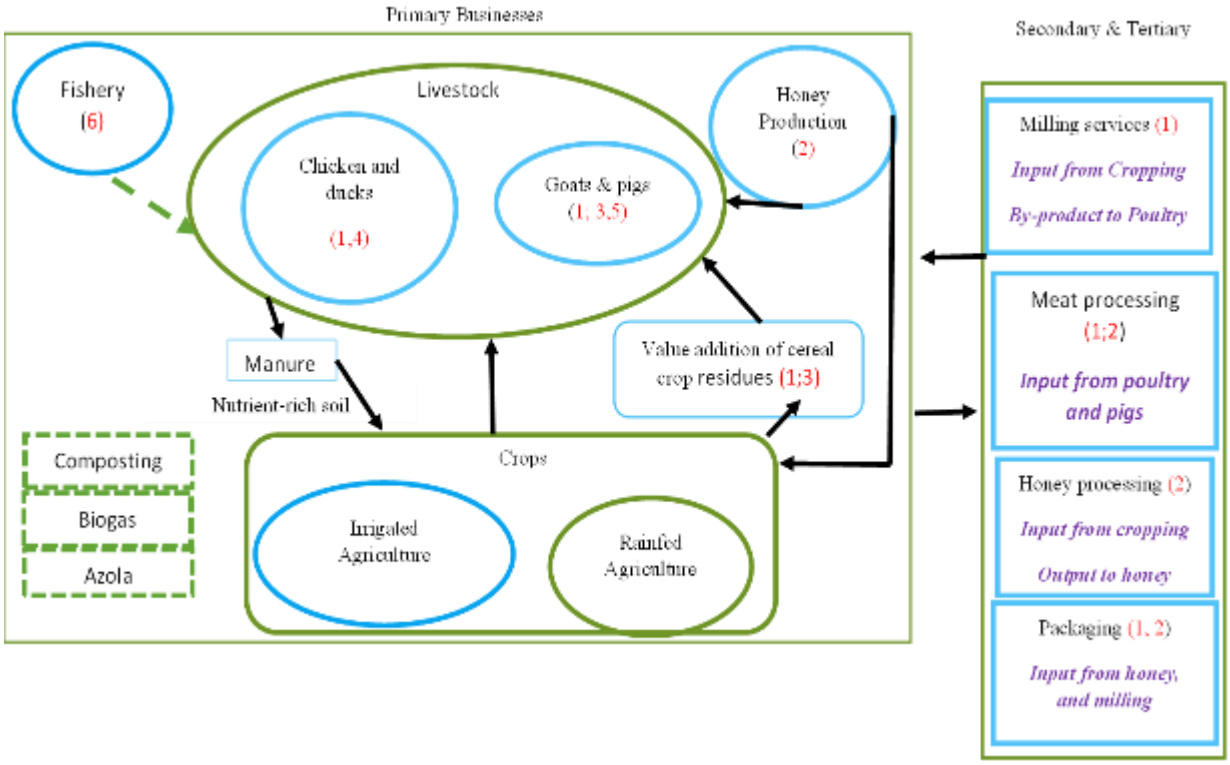

Figure 17:Mozambique CFS

The CFS project assisted farmers and entrepreneurs in applying for finance under two programs (Table 6). Gapi is a financial institution that provides finance for agricultural programs, including training and business management. Originally, farmers could apply for a standard line of credit for farm inputs, while a new three-year financing line is open to both individual entrepreneurs and collective entities engaged in production, processing, storage, transport, marketing, and agricultural services. Gapi became part of the Agricultural Innovation Platform (AIP) in August 2025, which provided close collaboration between producers and the institution and an ongoing process of sharing information about other programs. Producers now use the business plan model introduced during CFS training sessions. Another financing mechanism is the Local Development Fund (FDL), a nationwide government initiative. For the FDL, CFS assisted four producers with applications, encouraging them to train others. Similar support was provided for applications to the three-year Gapi program, including help with completing Google Forms.

Table 5: Summary of new and enhanced CFS-supported businesses in Mozambique

Code	Business Participation	Initial Business Focus	Potential Circularity Elements to be added	Potential Interventions	Anticipated Outcomes for Business Owners	Anticipated Flow-on Outcomes for Community
1	Mamaã Farmer X (25 de Setembro)	- Crop production - Processing (peanuts, maize) - Animal breeding (piggery, goats, chickens, ducks)	- Biogas digester - Composting - Vermicomposting	- Strategic planning - Bookkeeping - Staff mentoring - Market finance - Market linkages - Training in climate-smart agriculture - Improved storage facilities	- Improved income - Self-sufficiency - Improved livelihood - Enhanced food security - Diversified revenue streams - Stronger resilience to floods	- Employment creation for women and youth - Major buyer of waste from other farmers - Providing milling services (reducing travel distances for locals) - Women's champion - Reduced environmental pollution
2	Sr. Daniel	- Honey production	- Modern hives - More hives - Beeswax - Hive design to prevent honey badger - Modern smoker	- External funding (NGOs) - Training in apiculture - Branding and packaging for premium markets - Cooperative formation for bulk sales - Access to regional honey markets	- Increased incomes - Self-sufficiency - Improved livelihood - Entry into niche organic honey markets - Enhanced household resilience	- Employment creation - Farmer training in beekeeping - Provision of organic honey - Biodiversity conservation through pollination - Strengthened community networks
3	Sr. Julio	- Crop production - Piggery production	- Feed recycling - Manure use	- Own funds - Access to microcredit - Veterinary support - Improved housing for pigs - Training in feed formulation - Market linkages for pig products	- Higher income - Self-sufficiency - Improved livelihood - Reduced feed costs - Enhanced food security	- Employment creation - Breeding services for pigs - Farmer training - Improved soil fertility from manure - Local protein supply - Reduced waste

Table 6: Summary of new and enhanced CFS-supported businesses in Mozambique

Code	Business Type	Total # Business Plans	Number of Businesses	General Description (Range of Production)	Loan Amounts Sought (MT)	Owners' Investment (MT)	Circularity Components (New/Enhanced)	Anticipated Outcomes for Business Owners	Flow-on Outcomes for Community
4	Chicken and Ducks	11	– New: 7 – Expanded/enhanced: 4	– Poultry farming – Egg and meat production	15,000 – 160,000	– Small to medium household investment	– Manure recycling – Integrated poultry–crop systems	– Improved income – Self-sufficiency – Enhanced food security – Diversified products (eggs, meat, manure)	– Employment creation – Local protein supply – Organic fertilizer for crops – Reduced waste through manure use
5	Pork	2	– New: 2 – Expanded/enhanced: 0	– Pig farming – Meat production	100,000 – 1,115,300	– Medium to large household investment	– Manure recycling – Feed optimization	– Higher income – Self-sufficiency – Improved livelihood – Entry into local meat markets	– Employment creation – Local protein supply – Soil fertility improvement through manure – Training opportunities for piggery management
6	Fishery	3	– New: 0 – Expanded/enhanced: 3	– Fishing – Meat production	40,000 – 50,000	– Small household investment	– Fish heads, bones, and offal can be processed into fishmeal, animal feed, or organic fertilizer.	– Increased income – Diversified livelihoods – Improved nutrition	– Employment creation – Efficient waste recycling – Strengthened food security

Code	Business Type	Total # Business Plans	Number of Businesses	General Description (Range of Production)	Loan Amounts Sought (MT)	Owners' Investment (MT)	Circularity Components (New/Enhanced)	Anticipated Outcomes for Business Owners	Flow-on Outcomes for Community
7	Crop Production	23	– New: 0 – Expanded/enhanced: 23	– Crop farming – Residue utilization – Composting and biochar	11,270 – 90,900	– Small to medium household investment	– Manure usage – Feed from crop stover – Composting – Biochar production	– Improved yields – Higher income – Self-sufficiency – Enhanced soil fertility	– Employment creation – Reduced waste – Organic fertilizer availability – Climate resilience through soil improvement

Case Study 10. Mr Julio's integrated horticulture and piggery business

(Latitude: −26.0470, Longitude: 32.3340)

Background

In Boane, Maputo District, Mr. Julio began his pig farming journey in 2007 when, intending to buy a boar for slaughter at his wedding, he was persuaded by the seller to purchase a sow for breeding instead. The sow produced nine piglets, sparking his interest in pig farming. With prior experience from his parents' home and challenges in his poultry layer project, he shifted his focus to pigs. Operating in a rural setting, the self-financed enterprise initially grew rapidly but now faces feed shortages, reducing the herd to two sows and two boars. Production currently involves breeding, rearing, and direct marketing of live and slaughtered pigs through informal local market channels. Currently, he runs an integrated horticulture and piggery enterprise where the four pigs are partly fed on cabbage trimmings. Mr Julio has participated in the CFS project business planning, and this has provided a solid foundation for future growth. With this strategic technical support, the business is poised to expand into formal markets.

Contribution to circular food systems & agroecology

The piggery business demonstrates the application of CFS principles through efficient resource use, waste minimisation, and ecosystem-aware management (Figure 19). About half of the animal feed comes from on-farm crop residues, such as cabbage trimmings and locally sourced kitchen waste, while the other half is purchased weaner, boar, sow, and grower feed. By-product, in the form of pig manure, is applied as organic fertiliser on the farm's one-hectare irrigated cabbage plot. Around 17 fifty-kilogram bags are used per cropping cycle, producing an estimated 30–35 tons of cabbage per harvest. Plans to install a biogas system will enhance circularity by converting manure into clean energy for lighting and heating of the pigsties, and refrigerating slaughtered pigs, reducing winter mortality and electricity costs. The nutrient-rich biogas slurry will be used as fertiliser, closing the nutrient loop and reducing dependence on synthetic inputs. The business maintains informal partnerships with nearby farmers and traders, fostering local knowledge exchange and resilience, such as lending boars for breeding to strengthen local genetics. Post-production losses are minimised through direct live sales or in-house slaughtering and refrigeration before delivery to butchers. Overall, this integrated model effectively links crop and livestock systems to maximise resource efficiency, reduce waste, and boost farm productivity.

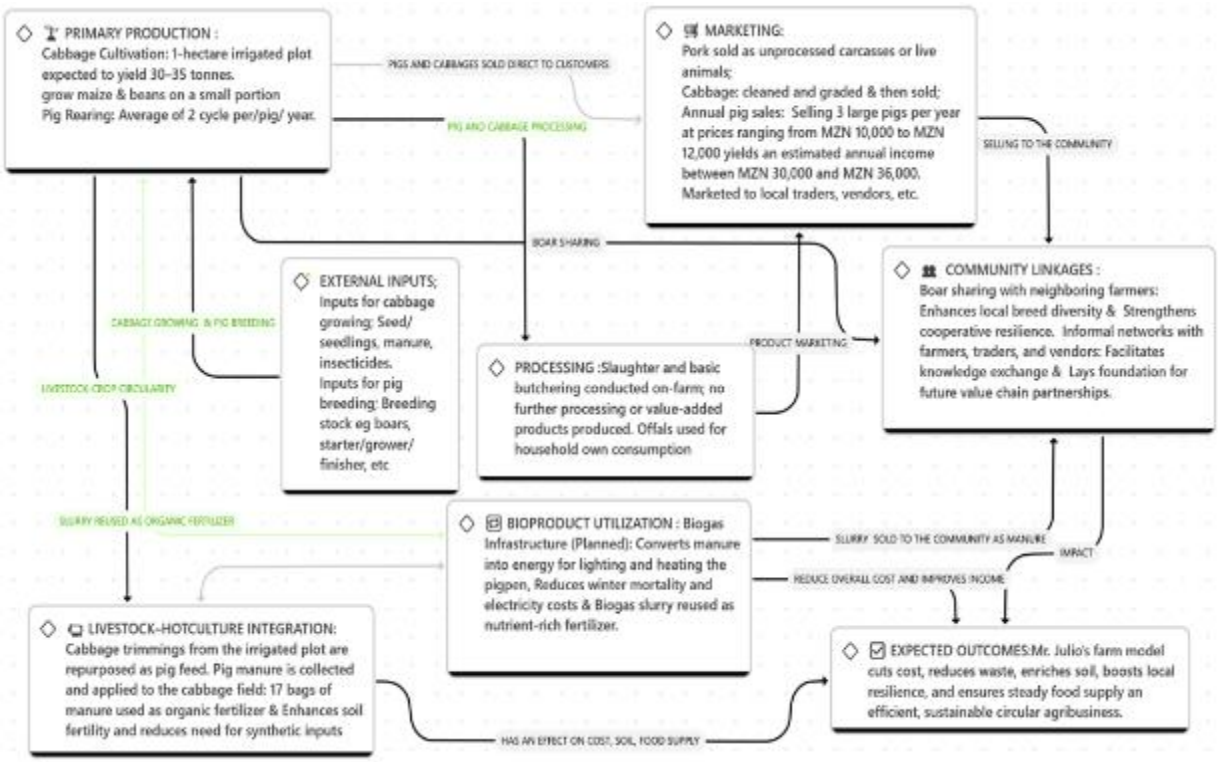

Figure 18: Integrated circular value chain: Julio's integrated horticulture-piggery business

Inclusion

The business integrates social and gender inclusion by engaging a small number of people in the community in its piggery and cabbage operations. Approximately half of the enterprise's workforce consists of women and youth from surrounding communities. In terms of the customer base, many buyers are also women and youth from nearby communities. The enterprise sells slaughtered pork carcasses (rather than processed or ready-to-cook products), which are accessible to these groups. This form of sales reduces some of the barriers women often face due to time and labour constraints. Julio employs two permanent workers (one male, one female) and four seasonal workers, who support operations on his one-hectare plot producing cabbage. A few of these workers are involved in cleaning, feeding, and slaughtering pigs, as well as working on the one-hectare plot. Women primarily handle cleaning services, while youth contribute to feed sourcing and slaughtering tasks. This gender and youth-sensitive hiring approach ensures inclusive participation and equitable income opportunities by balancing representation across age and gender groups. Through embedding inclusion into its labour practices and supply relationships, the enterprise not only strengthens its operational resilience but also uplifts the economic well-being of its surrounding communities. Its integrated model demonstrates how small agribusinesses can drive meaningful social impact, while maintaining efficiency and sustainability.

Economic, social, and food security benefits of the business

This business does more than just raise pigs; it weaves together economic, social, and food security benefits that help rural communities grow. It gives the owner a steady income and employs six people directly. Buying feed keeps costs down and helps local supply chains stay strong. Pig manure doesn't go to waste as it is used as organic fertiliser, which saves money on farm inputs. If there's any left, it is sold for 15 meticais per 50-kilo bag, providing a little extra cash for the business. The pigs themselves sell for about 300 meticais per kilo. Every year, they sell more than 40 pigs, each weighing between 50 and 80 kilos, all from just two sows and two boars.

Inside sections of the main pigsty: a sow with piglets (left), two sows in another pen (centre), and the exterior view of the pigsty (right).

There's more to the business than just profit; it engages the community by creating steady jobs and providing training in animal care and how to run a business. The farm shares boars with neighbours for free, which has improved the local breeds and helped other farmers with fewer resources to start their own pig projects. This facilitates more business, know-how, jobs, and opportunities in the village and improves food security. The pigs provide affordable protein, so families improve their diet. With the money from sales, the farmer's family can afford a better life, a bigger house, higher living standards, and a stronger safety net for difficult times. What really ties it all together is how the farm mixes pig and cabbage production. They feed cabbage waste to the pigs, which is efficient and cuts waste. This circular, local approach not only helps the environment but also makes the whole community more resilient during difficult times. It's a simple system, but it works and can be sustained, year after year.

Business sustainability and resilience

This horticulture and piggery business is holding its own, even during difficult times. The team works closely with partners like Serviço Distrital de Actividades Económicas (SDAE), Instituto de Investigação Agrária de Moçambique (IIAM), Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance (ACDI/VOCA), and Solidaridad. These connections help to sustain the business. The business pays its bills and, with only three other pig

producers nearby, faces limited competition. More recently, they have taken part in CFS training in business planning and recordkeeping, which has boosted their confidence to grow, reach more customers, and value-add and maximize return. Looking ahead, Mr Julio wants to tighten biosecurity so fewer piglets die, which means more profit and a chance to invest in something big: a biogas digester for clean energy. All these moves put the business at a competitive edge for steady, climate-smart growth.

Mr. Julio is in his cabbage plot at the 25 de Setembro scheme, where trimmings are used as pig feed.

Reflection and learning

- Improved technical support and market access.
- Recordkeeping and a clear business plan ensure financial discipline.
- Diversification and training emerged as key factors facilitating long-term sustainability and enterprise growth.

Reflections on CFS project mentorship & support

While the business had some planning in place, the CFS project is supporting the full integration of biogas infrastructure, effective planning, and the entry into formal value chains to boost business growth and create lasting benefits for the business and community.

Case Study 11. Farmer X's integrated crop, livestock, and milling business

(Lat: −26.0470, Long: 32.3340)

Background

Located in the Boane District, Farmer X, a retired educator, turned to farming after 17 years in Sofala, relocating permanently to Boane following severe flooding. In 2016, she sold her Beira residence and used the proceeds to invest in key agribusiness infrastructure, including a maize mill, peanut mill, pigsty, poultry units, and delivery equipment to support operations in Boane. Her children and a savings and lending group of 40 members provided further support for expansion. By 2022, she was processing up to 1250 kg of maize weekly and selling directly to consumers. She rents a 0.25-hectare irrigated plot. Her enterprise spans production (maize, poultry, goats, pigs), processing (mealie meal, peanut butter, poultry cuts), and retail. She manages 9 pigs, 4 goats, 5 ducks, broilers, and road runners across a value chain, including input sourcing, rearing, milling, and sales. With structured business planning support from the CFS project, the enterprise is positioned for sustained growth.

Contribution to circular food systems & agroecology

The agribusiness integrates agroecological principles into a circular food system through efficient resource use, community-based input sourcing, and nutrient recycling (Fig. 20). Approximately 70% of inputs (maize, crop residues, and livestock feed) are sourced locally, which reduces transport costs and emissions, while supporting local communities. Maize is processed into made-to-order mealie meal using a hydroelectric-powered mill and huller. The business sells directly to customers and small supermarkets in Maputo. The peanut mill produces peanut powder and paste. The mills provide processing services for at least four communities. Residues from green maize, mealie meal, and peanut powder are used as poultry feed and bedding. Livestock manure is used as organic fertiliser, minimising the dependence on synthetic input and enriching soil health, with surplus sold within the community. Intercropping beans and maize improves soil fertility, decreases pests, and adds crop diversity. The agribusiness includes chickens housed in a poultry unit with a 300-bird capacity, pigs kept in a masonry pigsty and fed on cabbage residues from the vegetable plot, and goats are maintained in a fenced yard bedded with maize stubble and fibrous material. The goats are fed on corn stubble and benefit from a year-round supply of maize residues. In this way, each livestock enterprise is integrated into the cropping system: poultry utilise grain by-products, pigs recycle vegetable residues, and goats convert maize stubble into meat and milk, while their bedding and manure contribute organic matter back to the fields.

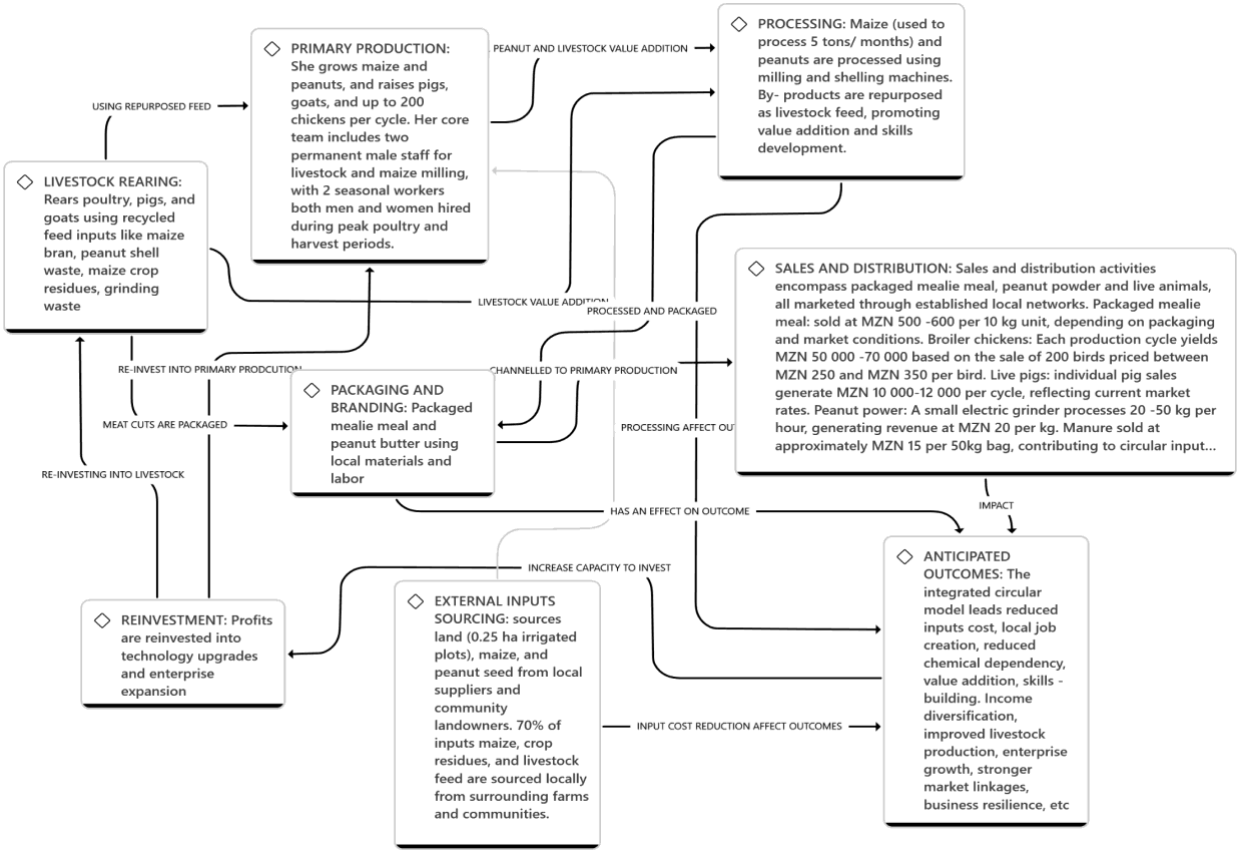

Figure 19: Integrated Circular Value Chain: Farmer X's Enterprise

Inclusion

The agribusiness incorporates inclusion across gender, youth, and socio-economic lines. Farmer X employs two permanent male youths, one handling livestock and one operating the maize mill. In addition, she employs one male and one female seasonal labourer during the peak poultry processing and crop harvesting periods. The female worker's roles include both animal husbandry and crop tasks. While small livestock are often managed by women, their involvement in broader farm work suggests a shift in local practice and may indicate efforts to expand skills across gendered roles. Today, over half of the client base comes from the local community, benefiting from affordable food products, maize grinding services, and customised peanut processing. Women's leadership is central: Farmer X manages operations, finances, and market engagement. Her visible role as a successful businesswoman positions her as a potential role model and champion for other women farmers in the community.

The poultry house with a capacity for 300 chickens (left); ducks feeding on stubble purchased from community farms (centre); and pigs housed in a section of the pigsty (right), all part of Farmer X's integrated business.

Economic, social, and food security benefits of the business

The agribusiness plays a critical role in Boane by enhancing rural livelihoods, local food systems, and inclusive economic growth. The enterprise helps to meet year-round demand by processing up to 5 tons of maize meal monthly (MZN 500–600 per 10 kg) and selling ~200 broilers per cycle (MZN 250–350 each) from at least four cycles annually. The business not only lowers transport and milling costs for community members through providing milling services and doorstep delivery but also bolsters nutritional diversity through pig and goat sales. Crop residues are reused for livestock feed and soil enrichment, showcasing strong circularity practices. Approximately 70% of operational inputs are locally sourced, ranging from maize grain to livestock feed, retaining value within the district. The four employed workers earn steady incomes that support their households, enhance local economic resilience, and build valuable skills in livestock management, crop production, and processing. Continued reinvestment of profits into infrastructure and livestock acquisition ensures operational continuity and growth. Through embracing resource-efficient methods and promoting inclusive practices, the agribusiness reduces waste, stimulates micro-economic activities, and enhances localised food systems. Anchored in sustainability and inclusion, this integrated value chain showcases how women-led enterprises can drive circular growth and community transformation under climate-smart development.

Business sustainability and resilience

The enterprise demonstrates strong sustainability through diversified income streams with profits reinvested into infrastructure, preventive maintenance, veterinary care, and staff oversight to reduce operational risks such as breakdowns and theft. Local sourcing lowers costs and strengthens supply links. With the ongoing CFS business planning support, the business is expected to improve financial management and market strategy. This can further enhance sustainability by formalising record

keeping, advising on cost-effective feed formulations, facilitating access to financing options that grow with enterprise needs, and linking the business to buyers.

The facilities where the community grain mill operates (left), and Farmer X standing beside the milling machine she manages, showcasing local enterprise and women's leadership in value addition (right).

Reflection and learning

- The value of peer support, especially local farmer advice, boosts poultry outcomes.
- Security gaps and equipment breakdowns reveal operational vulnerabilities.
- Future efforts could prioritise business planning, stronger marketing, and distribution to reduce risks and expand resilience.
- Access to finance from a variety of sources, supplemented by personal funds, was critical

Impact of the CFS project mentoring on the business

Farmer X's enterprise faces constraints: limited formal business planning, inconsistent bookkeeping, and restricted access to finance. With targeted CFS support on strategic planning, bookkeeping, mentoring of permanent staff, and market and finance linkages, the business can become more resilient and scalable.

Case Study 12. Daniel's integrated horticulture and apiculture business

Latitude: −26.0470 Longitude: 32.3340)

Background

Mr. Daniel Mathe runs an integrated horticulture and apiculture business in the 25 de Setembro Irrigation Scheme in the Boane District. He grows fruits and owns five beehives located around his irrigated land. Daniel started keeping bees when he was 13 years old and was taught the ancient way by the elders. His structured training started in 1999, and with his effort and encouragement of organizations such as the International Union for Conservation of Nature, he increased his activities to 56 traditional hives by 2012. He manages honey production, processing, and packaging together with his wife. Although Daniel used to run many colonies, due to continuous troubles, including honey badger attacks and losses caused by agrochemicals, he has drastically decreased his production to five colonies, and has seen a 30-member processing centre fail as market constraints forced many to exit the sector. Nevertheless, Daniel is a firm supporter of the idea of keeping bees as he understands that the sustainability of his business and the agricultural ecosystem in his area relies on pollination by bees. This belief is what drives him to create a critical mass of local skilled producers. He uses his experience to mentor new beekeepers in Maputo and Gaza, which will help the local production to remain sustainable and to make the sector resilient. Today, the CFS project provides him with training in business planning, which prepares his business for a sustainable future.

Contribution to circular food systems & agroecology

The apiary business enhances CFS by promoting ecological interlinkages (Figure 21). The bees gather nectar from the irrigated crops, trees, and riverside flowers, providing vital pollination services and strengthening both biodiversity and crop productivity. Honey production also yields bee pollen, propolis, and beeswax as valuable by-products. This symbiotic relationship forms a closed-loop system: the bees benefit from the local biodiversity, produce honey and wax, and the wax is reused to attract new colonies, enabling hive expansion without external inputs. This practice not only reduces waste but also lowers input costs, reinforcing the circularity of the enterprise. Daniel avoids agrochemicals and relies on traditional bee management techniques passed down from elders, preserving biodiversity and ensuring the production of high-quality, organic honey. The business reflects agroecological values such as respect for local ecosystems, reliance on indigenous knowledge, and minimal resource extraction. Opportunities exist to deepen these principles further.

Propolis can serve as an organic antibiotic for livestock. Flowering crops feed bees that produce honey and propolis. This creates a circular system where bees, crops, and livestock sustain each other,

enhancing productivity, soil health, and income. Further, diversifying apiary locations could enhance resilience to environmental shocks and expand pollination coverage. Strengthening collaboration with other beekeepers and farmers may foster cooperative marketing, shared learning, and value chain integration. Daniel's experience as a trainer positions him to scale agroecological practices across communities, promoting social inclusion and ecological stewardship.

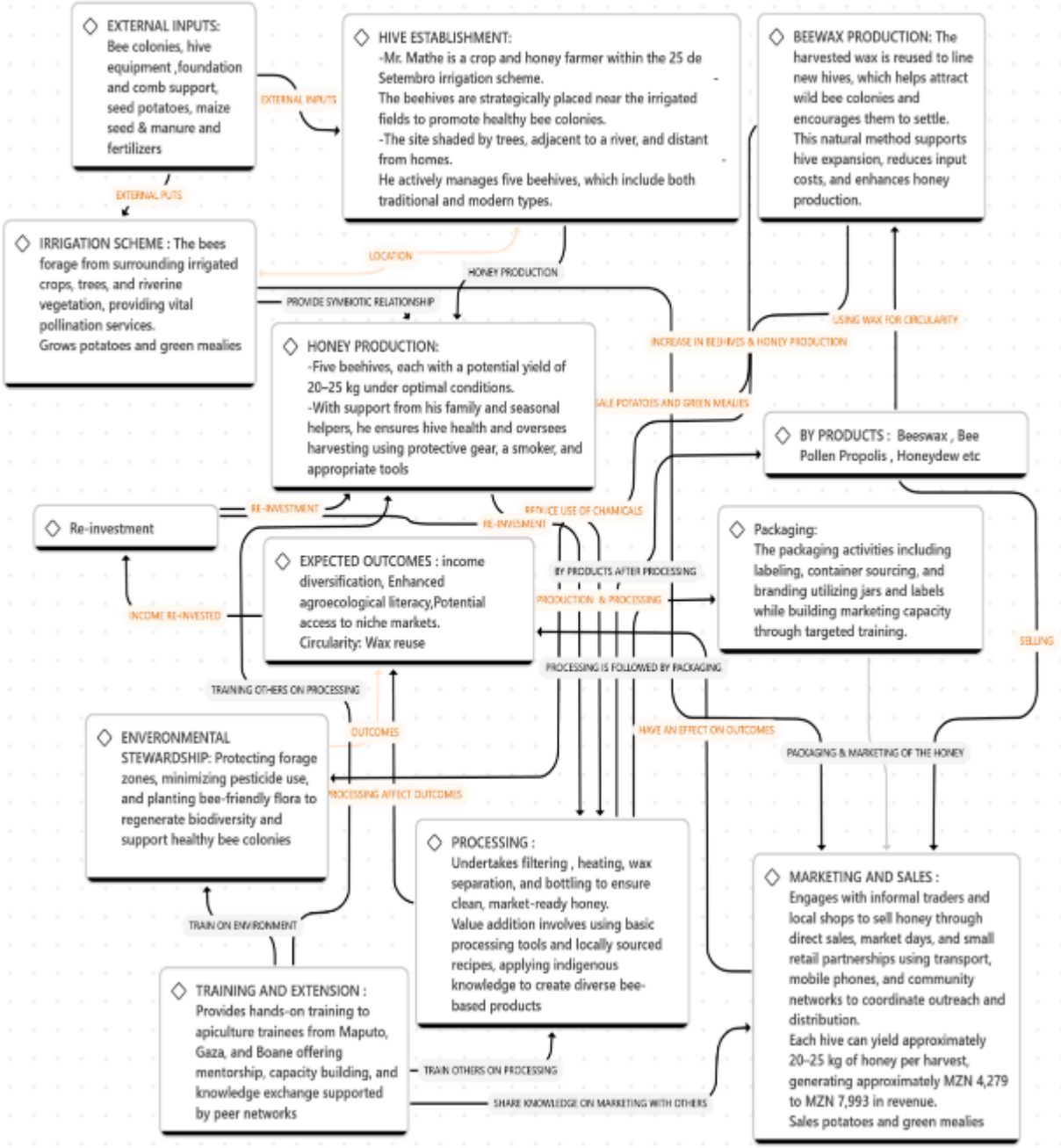

Figure 20:Value chain linkages Daniel's Integrated Horticulture & Apiculture in business

Inclusion

The apiary business integrates inclusion through family collaboration, gender balance, and community empowerment. The business is jointly managed by Daniel and his wife, with both actively involved in honey production and sales. This shared leadership reflects gender inclusion and highlights the role of women in agribusiness. Beyond household participation, Daniel is a committed trainer who mentors fellow beekeepers and plans to establish a youth beekeeping association. His goal is to train at least 20 young men and women in Boane, providing them with practical skills and fostering entrepreneurship. This initiative promotes social inclusion by engaging youth in sustainable livelihoods and encouraging knowledge transfer across generations.

Although small and family-run, the apiary maintains commercial relationships with intermediaries and local stakeholders, creating space for broader community involvement. Daniel's inclusive approach positions the business as a hub for cooperative learning and rural development. Through avoiding agrochemicals and embracing indigenous practices, the enterprise also supports ecological inclusion, ensuring that environmental stewardship benefits all. His training efforts make the model replicable across the district, amplifying its impact. The business commitment to circularity, resilience, and shared growth makes the apiary a living example of how inclusive practices strengthen community ties and sustainable food systems.

Mr. Mathe and his wife are at their irrigation plot, where they combine horticulture production with beekeeping as part of an integrated horticulture enterprise. In the photo is a potato crop.

Economic, social, and food security benefits of the business

The honey business offers clear economic, social, and food security benefits. Although current earnings are constrained by low production, the enterprise remains profitable. Each beehive can yield 20 to 25 kg of honey, generating approximately MZN 6,000 to MZN 7,500 per hive, based on a market price of MZN 300 per kilogram. The beekeeper employs cost-effective practices, such as simple packaging and labels, and plans to expand transitional hives to eliminate centrifuge costs, further improving margins. The bees also provide essential pollination service, supporting local farmers' incomes and community food security. Socially, the business has transformed the beekeeper's livelihood. Income from honey enabled him to build a modern house and marry, while also investing in livestock farming in another province. This secondary venture covers salaries for a herder and veterinary expenses, creating employment and supporting rural economies. The beekeeper's reputation as a local expert and trainer fosters community knowledge-sharing and youth engagement. Food security is reinforced through diversified income streams. While irrigated agriculture supports household earnings, honey production further adds a revenue stream. The bees benefit from a rich foraging environment supported by nearby irrigated crops and a river, ensuring consistent nectar flow and healthy colonies. Clean hive management and strategic placement away from homes reduce conflict and support long-term productivity.

Beehives managed by Mr. Daniel Mathe in Boane's 25 de Setembro irrigation community (left); and Mr. Mathe inspecting hive conditions to monitor colony health and activity (right).

Business sustainability and resilience

The apiary enterprise demonstrates resilience through its interdependence with irrigated crop production: bees enhance pollination and yields, while flowering crops sustain honey and propolis production. Daniel's strategic management and advocacy further secure the beekeeping business. The apiary enterprise is underpinned by Daniel's strategic management and his advocacy within the sector. Although the agrochemical drift and the honey badger attacks were constant dangers to his colonies in the past, Daniel was able to manage these dangers by relocating some hives to a safe, abundant foraging

habitat without houses and liaising with farmers to help increase the awareness of pesticides. He has properly kept beehives that are full of bees, giving good honey and healthy bee colonies. Although the production has decreased after the destruction of his previous colonies, the present sale of honey continues to help the business support his income earned through irrigated crops, and this is an illustration of the core stability of the business. The long-term objective of Daniel is to expand his apiculture, formalize his branding, and empower the local sector by mentoring young people using a beekeeping association. He is also backed by technical training from the CFS project, a pool of loyal customers, and equipment support from the Italian Development Agency, which strengthens his future operational capacity. Earlier concerns about the limit of the market linked to risks of market collapse have been mitigated through stable demand and diversified customer connections, ensuring that this is no longer a constraint on the enterprise's sustainability.

Reflection and learning

- Lifelong familiarity with beekeeping and support from projects strengthened the business setup.
- Personal resilience helped overcome market access issues and honey badger threats.
- Investing the profit from his farming operation in equipment reduced external dependency.
- Plans include a processing centre, branded sales points, a youth association (15–20 members), and inoculation measures.

Reflections on CFS project mentorship & support

With strategic business-planning support from the CFS project, the honey enterprise is well-positioned to scale colony numbers and honey production. The CFS support is specifically strengthening market linkages through the AIP, developing a formalized branding strategy, and structuring the necessary reinvestment to procure new, resilient hives, which will directly enable the increase in colony numbers and production volume. Furthermore, the project is guiding the farmer to circularize the business so that high-value by-products such as beeswax and propolis can be repurposed to support colony health and growth and serve as natural antibiotics for livestock.

Conclusion and key lessons from the CFS Project's business development interventions

The key lessons from the CFS project's business development interventions are synthesised in Table 7. These lessons can guide the implementation of circularity in rural smallholder communities in southern Africa.

Table 7: Lessons for scaling circular food systems

Lesson	Evidence from the Field	Strategic Impact
1] Strategic integration produces quick gains	Replacing external inputs with local alternatives immediately lowers costs for business owners and the community.	Leverage off existing local entrepreneurs and local priorities with demonstrated demand. Quick gains via import Substitution
2] Business planning to identify by-products builds economic resilience	Strategic business planning identifies by-products Milling residues for feed increased drought resilience and livestock survival. Organic fertiliser from livestock by-products reduces bought fertilisers.	Use of by-products produces financial gain Resource decoupling
3] Establishing, strengthening and extending business network synergies accelerates business development	Business-to-business exchanges enabled poultry producers to optimise water abstraction.	Knowledge-driven innovation
4] Leverage off capital diversity and agility is critical under current formal lending constraints	Diverse forms of capital are used: seed funding from donors, selling livestock, remittances, retirement savings, two or more households pooling resources, investing profit from existing business or from other income-generating activities, local savings and lending groups, and small incremental savings.	Self-funded resilience Entrepreneurs used farm profits and other forms of capital to bypass rigid bank barriers.
5] Scale-appropriate infrastructure and technology are critical enablers of new businesses	Solar adoption saved up to $1,000/year in fuel while reducing the carbon footprint. Improved milling accessibility supports household's efficiency, income and food security.	Operational cost-reduction Technology can have significant benefits for customers
6] Mentorship and business planning have multiplier effects on business development	Entrepreneurs with practical skills in financial management, record keeping, branding, and market engagement. Mentees becoming mentors created a self-sustaining knowledge ecosystem.	Long-term business resilience Scaling out of businesses
7] Empowering champions for inclusion produce social returns	Inclusion of underserved in business development and new job opportunities. "Cash-only" policies and youth nurseries circumvented long-standing gender/age biases.	Inspiring and supporting underserved groups. Social barrier disruption
8] Creating businesses generates flow-on prosperity	Local poultry, egg, and horticulture businesses improved community nutrition and job access.	Mushrooming opportunities

Lesson	Evidence from the Field	Strategic Impact
9] Building capacity and CFS scope requires incremental processes	Significant capacity building preceded CFS project Meaningful change requires a pace that matches community capacity. Agriculture is and will remain a critical component of CFS development	Staged development for lasting CFS change

Together, these lessons illustrate a successful strategy for how the decoupling of rural economic growth and environmental degradation can be stimulated. While the CFS project established a high-trust foundation through an earlier project, diverse forms of capital generation and circular efficiencies, scaling these operations to a regional level will necessitate the injection of formal financial capital. To overcome the current risk-aversion of banks and potential lenders, a strategic next step needs to involve piloting de-risking finance models such as a grant-funded revolving loan facility. This would allow for a controlled demonstration of the small businesses' repayment capacity, building the confidence required to unlock formal al lending for long-term impacts.

The CFS project has successfully substantiated the hypothesis that functional irrigation schemes can serve as economic engines for their surrounding rainfed and livestock communities. By strategically integrating agroecological and circular practices through Agricultural Innovation Platforms, the project has successfully established a network of profitable small businesses across Zimbabwe and Tanzania, and this is commencing in Mozambique. These enterprises have demonstrated that circularity is a practical mechanism for local value addition, job creation, and significant cost reduction through the valorisation of by-products.

However, a critical insight emerged regarding the scalability of these models. While the project fostered a high-trust foundation through the activation of internal capital and circular efficiencies, the transition to more diverse and expanded operations, covering larger trading areas, remains constrained by the lack of functional formal finance. The deep-seated risk aversion between traditional banks and rural small businesses creates a barrier that internal profits alone cannot bridge. To unlock the next level of growth, a second phase (CFS II) would be essential. We recommend the implementation of innovative, de-risked financing pilots where grant capital is utilised as seed funding. Such a mechanism would serve as a confidence-building bridge, allowing entrepreneurs to establish a formal repayment track record while demonstrating the bankability of circular business models to sceptical lenders.

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