

Agroecological Business Model Diagnostics and Upgrading Plan for Sorghum Contract Farming in Mbire District, Zimbabwe.



INITIATIVE ON
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Abstract

This report synthesizes the processes followed to identify potential agroecology business models, the business model diagnostics, financial and viability analyses conducted, and business support and upgrading for a Sorghum contract farming out-grower scheme in Mbire District in Zimbabwe. Centered on agroecological principles, the report synthesizes findings from the Value Chain Analysis, Business Model Canvas, and Agroecology assessments, alongside a SWOT analysis and lessons from implementation challenges. Key findings from the existing business model revealed partial alignment with agroecological principles, achieving a B-ACT score of 52%, highlighting significant room for improvement in biodiversity, resource efficiency, and social equity. The SWOT analysis underscored strengths like high demand for drought-tolerant sorghum and robust market linkages. However, weaknesses include dependency on rainfed agriculture and limited access to financial and technical resources. Challenges such as climate variability, especially drought, and gaps in participatory governance emerged as critical barriers to success. To address these, there is a need to deepen agroecological integration by promoting crop diversification, organic inputs, and synergies between crop and livestock systems, reducing environmental impact while enhancing resilience; and strengthening farmer capacity through participatory training in Integrated Pest Management (IPM) and conservation practices, alongside embedding indigenous knowledge systems. Moreover, financial accessibility should be improved through climate-resilient financial products and market innovations like price stabilization mechanisms. Investments in infrastructure, including irrigation and processing facilities, are vital for reducing climate vulnerabilities and post-harvest losses. By implementing these strategies, the model can transform into a scalable, resilient framework for agroecological and economic progress

Introduction

The CGIAR's Transformational Agroecology across Food, Land, and Water Systems Initiative, or Agroecology Initiative, is designed to catalyze systemic changes toward resilient, sustainable, and inclusive agricultural and food systems. The Initiative aims to address the pressing environmental, social, and economic challenges facing global agriculture, focusing on how agroecology can transform the interactions between food production, land use, and water management. By employing agroecological principles—like circularity, co-creation and inclusivity, and diversity—the initiative seeks to promote environmentally regenerative and socially equitable agricultural practices that contribute to improved ecosystem health, food security, and community resilience, particularly within low-income rural settings.

Work Package 3 (WP3) is key in this initiative by bridging agroecological transitions with viable business models that provide meaningful economic opportunities for smallholder farmers and low-income rural communities. The core objective of WP3 is to ensure that communities equitably benefit from emerging and existing agroecological business opportunities within their regions. In addition, WP3 facilitates the enhancement of existing producer-market linkages and fosters innovative financial mechanisms to support inclusive, profitable business models based on agroecological principles. This is done through collaborations with trading partners, public and private investors, and local stakeholders to co-design business models that can integrate new agroecological innovations or upgrade or strengthen existing ones. In essence, WP3 and its innovative business models serve as instruments to upscale agroecological innovations by building a bridge between theory and practical, scalable solutions that can empower smallholder farmers and rural communities to thrive in agroecological economies. This ensures that the incremental changes required for a successful transformation are financially feasible and socially inclusive, fostering resilient, profitable, and sustainable agricultural systems.

Objectives of this study

This study synthesises the processes followed to identify potential agroecology business models, the business model diagnostics, financial and viability analyses conducted and business support and upgrading for a Sorghum contract farming out grower scheme in Mbire District in Zimbabwe.

Study Location

Mbire District, located in Mashonaland Central Province in Zimbabwe's lower Zambezi Valley, spans approximately 4,696 km² and encompasses 17 wards with a population of 83,724 across 19,915 households (ZIMSTATS, 2022). This sparsely populated district falls under Agroecological Region IV, characterized by arid conditions with annual temperatures ranging from 15°C to over 30°C and low rainfall averaging between 450 and 650 mm. Its location within the floodplains of the Zambezi River basin exposes it to frequent hydrometeorological threats, particularly droughts, impacting local livelihoods. The district's soil, derived from sandstone and lime-rich sedimentary formations is variable, but often lacks organic matter, making it poor quality, posing additional challenges to crop production. The land tenure has influenced landholding in the district and each household owns an average of 3 hectares. Despite these conditions, agriculture remains central to Mbire's economy, with prevalent mixed crop and livestock systems adapted to the region's climatic constraints.

Agriculture revolves around staple crops (maize and sorghum), with other cash crops (cotton, sesame, and rosella), and nutrient-dense legumes such as groundnuts, and cowpea common. Due to climate and soil conditions, farmers in Mbire are adopting drought-resistant crop varieties, livestock breeds, and rotational crop-livestock systems to maximize productivity and sustain livelihoods. Livestock production is the main source of income and livelihood especially cattle and goat production supplemented by poultry and apiculture production. The district receives external support from the Government, NGOs such as Action Aid, the Adventist Development and Relief Agency (ADRA), and the African Wildlife Foundation (AWF) to strengthen agricultural practices, and market access, and address human-wildlife conflict, a common challenge in Mbire district. The fact that part of the district is a wildlife conservation area worsens the incidences of human-wildlife conflict. Most cash crops in the district are produced under contract farming arrangements with the private sector, such as brewing companies, like Delta Corporation. NGOs provide critical support to enhance livestock and crop production, with programs on sustainable beekeeping, poultry, and market access. The Government parastatal, Grain Marketing Board (GMB) is the main buyer of cereal crops while Cotton Company (Cottco) and Cargill are the main buyers of Cotton.

Sorghum is a staple crop in the Mbire district produced by almost all farm households for home consumption and sale. Aside from contract farming, farmers access inputs through the presidential input support program. Several local traders buy bulk sorghum at the village level and later sell it to GMB depots at Mushumbi. Most of the sorghum grain purchased by GMB is transferred to the Food Grain Reserve, and some of it is sold to different processing industries for feed and beverages. There are several actors involved in the sorghum value chain, from agro-dealers who supply inputs, farmers engaged in primary production, traders, transporters, and processors. While the bulk of the sorghum is sold locally in Zimbabwe, informal exports to neighboring countries are common. Its drought tolerance and availability of a large local market with active contract farming arrangements make the sorghum value chain attractive for upgrading.

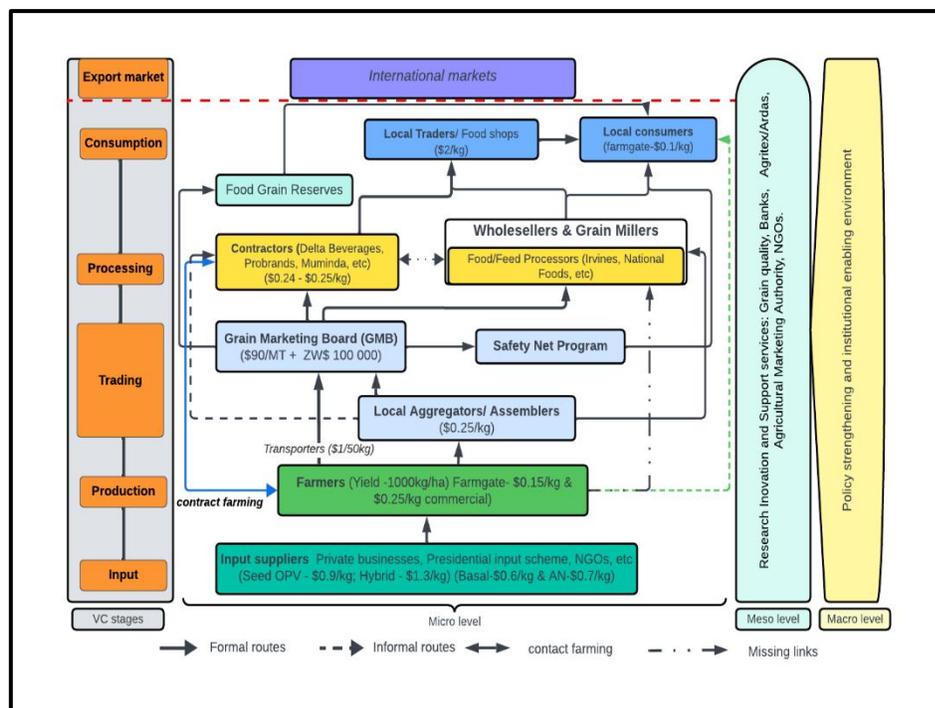


Figure 1. The Sorghum Value Chain Map in Mbire district

Methodology

Our approach followed a participatory and consultative process to inform the business enterprise model development and selection. All the identified business models were selected based on their interest and willingness to align or implement the new or re-designed model in line with the 13 agroecology (AE) principles. At the ward level, we conducted key informant interviews with key food system actors (FSAs) for the Rapid Value Chain Analysis, business model identification, and business canvas development. For the Rapid Agroecology Value Chain Analysis (RAVCA), semi-structured questions were framed around four modules (i) General information of the actor, (ii) value chain characterization, and (iii) value chain diagnostics, and (iv) agroecological assessment.

In terms of the process, the following steps were followed:

- Several value chains aligned to agroecology were assessed to identify challenges and opportunities for developing or upgrading business models.
- Value chains were prioritized to identify potential business models and financial modalities to upgrade.
- The business models and financial modalities were classified according to how they perform on agroecological principles (e.g., according to the Agroecology Check for Enterprises (ACE) and Business-Agroecology Criteria Tool (B-ACT), social equity, and economic viability.
- Business model canvases were developed for selected existing business models, including the identification of challenges and opportunities for the trading partners.
- Cost-benefit analyses (CBAs) to assess the profitability of innovative business models (i.e., applying agroecological principles) versus business as usual were carried out, for short- and long-term periods.

Identification and assessment of the business models

We used a two-step process for preliminary screening to identify and assess inspiring and promising business enterprises' alignment to agroecology. We utilized the Agroecology Check for Enterprises (ACE) tool and the "dry test" assessment of the enterprise business model. We assessed whether the existing enterprise business model, value-generating activities, or strategy/scalability are, to some extent, aligned with agroecology and the potential of the current model to incorporate some of the principles based on the developed business model canvases. The ACE tool was applied to assess business enterprises aligned with agroecological principles and areas with potential for improvement or activities that conflict with agroecology. The assessment is classified into three grades - "pass", "partial pass", or "no pass" per each focus area [Regenerative, Diversified, Healthy, Fair and connected, and overarching] and develops an overall assessment grade. *Figure 2* below shows an overview of the business enterprises for which value chain analyses were done and business model canvases developed. From a preliminary assessment of an enterprise's alignment with the 13 principles using the ACE tool, it was discovered that all the identified models partially aligned with the principles of agroecology. However, from an initial list of six value chains, seven business model canvases were developed, and three business model were prioritized. In the end, only one business model, Sorghum contract at farming with PHI Agrowth was implemented in Mbire district.

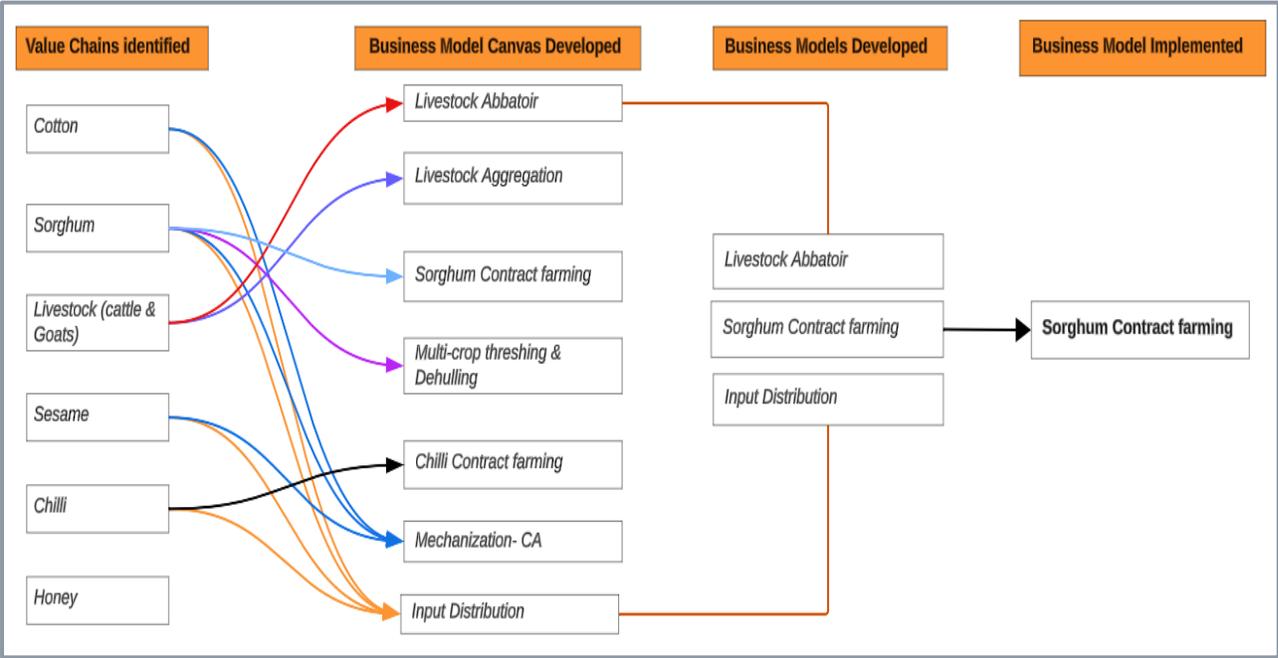


Figure 2. Identified Value Chains for Actors Mapping and Business Model Development.

In Mbire district, 6 Value chains were mapped and business models were identified. We conducted the preliminary assessment on the functionality and inclusivity of the identified business models and identified the existing financial mechanisms and investment cases for supporting agroecological transitions. 7 Business model canvases were developed based on the identified value chains. After developing the BM canvases, we engaged all the potential partners and investors who might be interested in implementing the business models co developed. Three proposals were submitted for Mbire by PHI Agrowth sorghum contract farming, PHI livestock Abattoir and Farmshop Input distribution. We assessed each of the proposal using the ACE tool to select the best business model to support and also their capability to drive the transition process. The livestock abattoir business model was affected by the bureaucratic processes within the Government to offer an agreement to use the existing council infrastructure already established at Mushumbi. Finally, we had PHI Agrowth as the final partner to support sorghum contract farming in Mbire district.

Business model diagnostics

Description of the relevant stakeholders

PHI Agrowth aims to secure Inncor Africa investments in Zimbabwe by ensuring that raw material requirements are met while contributing to national food security. The Inncor Africa group, which includes National Foods, Stock Feeds Division and Profeeds, Probrands, Irvine’s, and Buffalo Brewing Company- produces sorghum beer and feed processing. The Company is linked to sister companies like Nutri-Master which specializes in soil testing and manufacturing of synthetic fertilizers. Agrowth provides small-scale farmers crop production finance, market linkages, and agronomy support services for a maximum of 1 hectare. From the survey of 50 farmers in Mbire district who are on contract farming, the results indicated that on average, households operate on 2.3 hectares of land with one hectare allocated to sorghum contract farming (Table 1). The demographic characteristics of these contracted farmers show that most of the households are male headed (86.7%) and have an average of six household members. Most of the household heads are middle-aged, between 33 and 66 years old, and have attained up to secondary-level education. Most household heads (91.1%) are married, and farming is the main occupation for 91.1%, emphasizing the reliance on agriculture. These findings underscore the need for targeted agricultural support, gender-inclusive policies, and capacity-building initiatives.

Table 1. Summary statistics for 50 Contracted Agrowth farmers in Mbire.

Variable	mean	minimum	maximum
land area (ha)	2.3	1	5
household size	6	2	15
Hhead age (yrs)	48	31	66
Hhead gender (male==1)	86.7		
Hhead education: (none=0)	4.4		
Primary	40		
Secondary	53.3		
Tertiary	2.2		
Married (1= yes)	91.1		
Main occupation (farmer=1)	91.1		

Note: N=50 farmers who are on contract farming with PHI.



Figure 3. Sorghum production under contract farming in Mbire ward 3.

The key actors in the sorghum value chain comprise the producers, processors, contractors, and the technical, financial, and input providers who work directly or indirectly with Agrowth. These actors play a significant role in the sorghum value chain. *Table 2* details the actors' roles of the key actors who are supporting the sorghum contract farming business in the Mbire district.

Table 2. Actors mapping in the sorghum business model.

Actor	Role(s)
PHI Agrowth	<p>PHI/Agrowth serves as a contractor, providing critical support to small-scale sorghum farmers through its contract farming model. The company's main responsibilities include:</p> <ul style="list-style-type: none"> - Providing Inputs and Financing: PHI/Agrowth offers production financing and essential inputs (such as seeds, fertilizers, and pesticides) to farmers, allowing them to grow sorghum without the need to front the initial capital. - Technical and Agronomy Support: The company provides ongoing agronomy support, including crop management advice and crop monitoring via satellite imagery, to improve productivity and ensure sustainable practices. - Guaranteed Market Access: By securing offtake agreements with buyers, PHI/Agrowth guarantees a market for farmers' produce at premium prices, reducing the farmers' market risks.
Farmers	<p>Smallholder farmers are the primary producers and beneficiaries receiving inputs, technical support, and access to markets through the contract farming arrangement.</p>
Other actors	<p>Financial Institutions: to secure funding, which is used to finance inputs and operational costs for contract farming.</p> <p>CIMMYT: provide mechanized multigrain threshers to improve the quality of harvested sorghum and offer local employment opportunities, technical backstopping demand, and awareness creation and capacity development training.</p> <p>Local Service Providers: such as transporters and threshing operators, support logistics and processing, enabling efficient production and distribution.</p> <p>ARDAS /AGRITEX and Local Authorities: provide technical assistance, compliance, and coordination with the farming community.</p> <p>Processors: Buffalo Breweries is the beer processing firm that demands the highest percentage of grain. Profeeds and National Foods Pvt Ltd are also into food and feed for animal processing..</p> <p>Nutrimaster- the supplier of synthetic fertilizers and soil testing services to farmers under contract farming.</p>

Results of the assessment ACE and the B-ACT

The Agroecology Check for Enterprises (ACE) and the Business Agroecology Criteria Tool (B-ACT) exercises were conducted to evaluate the agroecological alignment and sustainability of the sorghum business model. This process involved assessing the business against key 13 agroecological principles classified into three operational principles – improve resource efficiency, strengthen resilience, and secure social equity/responsibility. The exercise utilized participatory approaches, engaging stakeholders including farmers, agribusiness representatives, and researchers to co-create an understanding of the model's strengths and gaps in agroecological performance. Data were gathered through structured discussions, and field observations, which provided insights into the integration of ecological practices and socio-economic benefits. This data was collected using the Biovision toolkit which was filled together with the private business enterprises.

Firstly, we carried out a preliminary assessment of how agroecological the business enterprise was using the ACE tool. This was used as a screening method against all potential business enterprises that the AEI would prioritize. The ACE result measures an enterprise's practices and operations against a set of criteria rooted in the 13 principles of agroecology. The sorghum contract framing model assessed achieved a *'partial pass'* result indicating that the enterprise meets some, but not all, agroecological standards and practices. Apart from that, the *'partial pass'* implies

room for improvement, particularly in areas like deepening ecological sustainability, enhancing social equity, or adopting more regenerative practices. In an in-depth assessment of the model, the business model Agroecology Score was 52% (Figure 3). Similarly, the score suggests that the evaluated business is partially aligned with agroecological principles but has significant room for improvement. Achieving a score just above 50% indicates a moderate level of adherence to agroecological standards, implying that while some practices align with agroecology, further efforts are needed to fully integrate these principles.

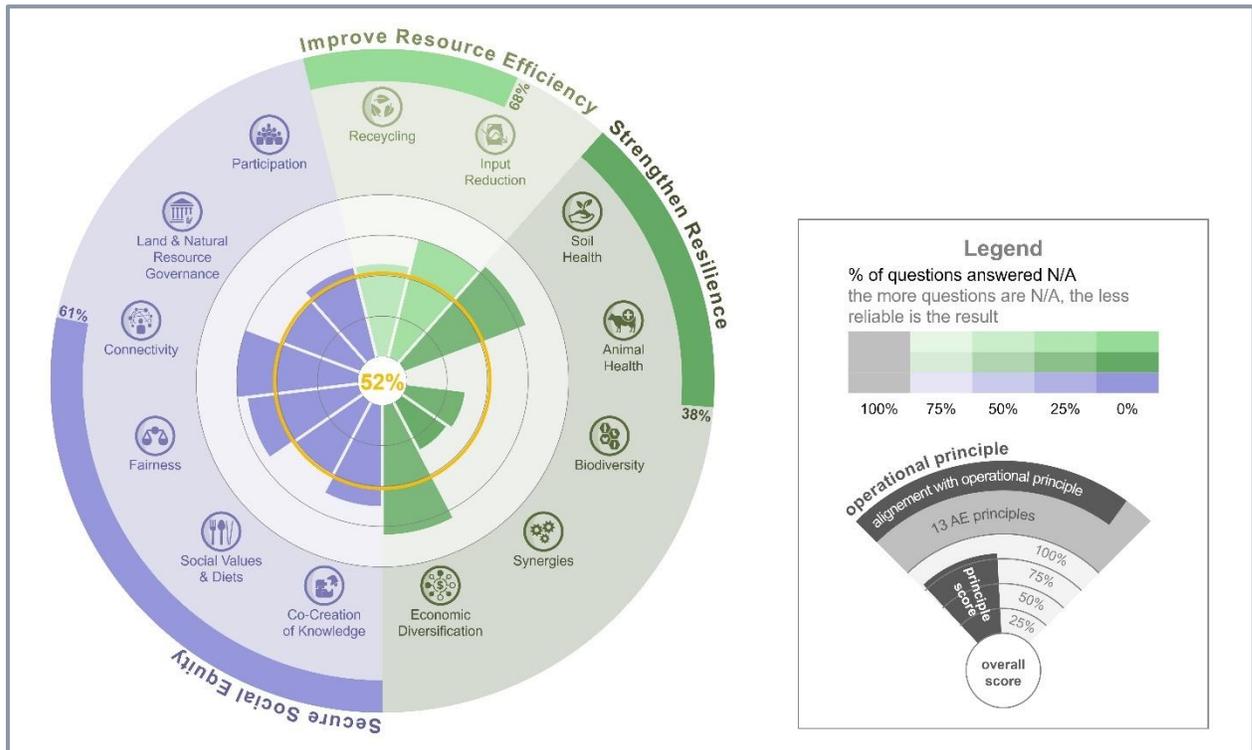


Figure 4. B-ACT results for the sorghum business model.

The B-ACT assessment indicates a stronger performance in areas that contribute to resource efficiency (68%), particularly Input Reduction (75%), where the business is actively minimizing external inputs and promoting circularity in the farming system. In the social equity dimension, the business achieves 61% in Land and Natural Resource Governance, demonstrating efforts to involve stakeholders in decision-making and ensure equitable resource management. Participation, Economic Diversification, and Social Values & Diets are also relatively well-integrated, indicating moderate efforts to involve smallholder farmers and promote diverse livelihoods. The business is putting more effort in creating links between producers and other value chain actors as highlighted by a 75% score on the principle of connectivity.

However, critical weaknesses are observed in principles that are key to Strengthening Resilience with a low score of 38%. These include Soil Health, Animal Health, and Biodiversity, areas essential for building adaptive capacity and ecological stability in farming systems. However, there is a strong emphasis on soil health and economic diversification which had a score 80% compared to other principles below 50%. There was no direct link of the business model to animal health (0%) except through fodder making by some farmers. Additionally, Synergies, which involve optimizing interactions between various components of the agroecosystem, also require improvement. Social principles such as Fairness and Co-creation of Knowledge, while present, need further

enhancement to ensure equitable benefit-sharing and a stronger inclusion of local and indigenous knowledge systems in the business model.

To improve its agroecological alignment, the business should invest in practices that enhance soil fertility, support biodiversity (e.g., through crop diversification, agroforestry, or conservation efforts), and integrate livestock health into the farming system. Further strengthening participation, connectivity, and fairness can also contribute to making the business more inclusive and sustainable while building resilience against climate and market shocks.

Results of the Business Model Canvas and the SWOT analysis.

The Business Model Canvas development

The business model canvas for the sorghum contract farming business was developed using participatory methods to ensure all aspects of the model were comprehensively addressed. Stakeholders were engaged through structured brainstorming sessions, focus group discussions, and iterative feedback loops to identify and refine key components. The process relied on qualitative data collection methods such as stakeholder interviews to gather insights on operational challenges, opportunities, and the relationships between various actors in the value chain. Secondary research and data analysis supported the identification of market trends, resource requirements, and cost structures. Visualization tools, such as charts and diagrams, were employed to map interconnections between activities, resources, and revenue streams, creating a coherent and actionable framework.

As highlighted in [Table 3](#), the enterprise proposed the establishment of a red sorghum contract farming operation in Mbire district, and the open market procurement of white sorghum. The value proposition for the business model was the offer of a guaranteed sorghum market as a new market channel for small grain producers in the Mbire district. The company offered better payment terms than GMB and farmers accessed improved quality seeds. Key customers for PHI commodities are the Inncor Group - National Foods, Irvines, Buffalo Brewery, and others. The company reached farmers through its field staff and buyers. Various communication methods were used to reach farmer suppliers and customers. The company has considerable experience in commodity broking and used its existing systems in its operations in Mbire. Key activities included district engagement to get an understanding of highly productive farmers, farmer selection and field assessments, farmer training, seed and input distributions, and procurement of grain. The key costs and resources needed included staff, trucks for grain transportation, vehicles for monitoring and supporting contract farmers, and smartphones for communication and logistics. Key partners for the success of the business model are the farmers, banks and input providers, development partners and Agritex who are key in training farmers on production, contract farming, and other related topics. Other key partners are grain threshing service providers who provide the much-needed services to reduce labor associated with grain processing.

Table 3. Business Model Canvas for sorghum contract farming.

Business Model Canvas- Agrowth				
Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
Farmers Finance Institutions Input providers AGRITEX RDC Transporters Grain threshing groups CIMMYT	District engagements Awareness meetings Farmer selection and field assessments Farmer training Seed and input distributions Procurement of output	Guaranteed market for sorghum farmers Improved incomes for the farmers Better payment terms after delivery of crop Access to quality seeds	Good communication including WhatsApp groups Placement of field officer Training of businesses and farmers Regular meetings with farmers and stakeholders like NGOs, Agritex Fulfillment of contract agreement	Breweries Grain Millers (sorghum and Millets) Beer customers (wholesaler to consumers) Feed Companies
	Key Resources		Channels	
	Human resources officer Grain Threshers Motorbike Smartphone Cash		Contract farming Physical meetings Virtual communication through WhatsApp and calls Communication through Agritex and the project	
Cost Structure			Revenue Streams	
Logistics Salaries Communication Sorghum and inputs Cash for sorghum procurement			Sorghum sales to breweries Sale of sorghum dregs to livestock farmers Charging for threshing services Sale of white sorghum	

Based on the developed model, it was suggested that to strengthen the business model canvas for agroecological transitions, the focus should be on integrating sustainability and resilience into every aspect of the model. This would include enhancing the value propositions by offering incentives like green subsidies or premium pricing for eco-certified sorghum and embedding agroecological training into farmer programs to promote practices such as soil health management, crop diversification, and natural pest control. Key resources should be diversified to include tools and inputs that support agroecology, such as biofertilizers, composting equipment, and drought-tolerant seed varieties. At the same time, there was scope to expand partnerships to include agroecological experts, NGOs, and government bodies advocating for sustainable farming policies. The model could also target eco-conscious consumer segments and niche markets with marketing campaigns emphasizing the environmental and health benefits of agroecologically grown sorghum, supported by certifications and traceability systems. Additionally, investments in digital platforms and small-scale processing infrastructure could streamline operations, reduce post-harvest losses, and open new revenue opportunities through value-added products, ecosystem service payments, and carbon credits. These adjustments would align the business model with agroecological principles, ensuring sustainability, profitability, and resilience for smallholder farmers and their communities.

The SWOT Analysis

The SWOT analysis was conducted as part of a strategic evaluation of the proposed agroecological sorghum contract farming business model, aiming to enhance smallholder farmers' livelihoods while promoting sustainable agriculture. The process involved an in-depth consultation between the implementing partner and focus group discussions with farmers to identify key internal and external factors influencing the business model's success. In summary, the results indicated strengths such as the high demand for sorghum, its drought resilience, and alignment with agroecological principles were highlighted, while weaknesses like limited access to quality seeds and training were identified.

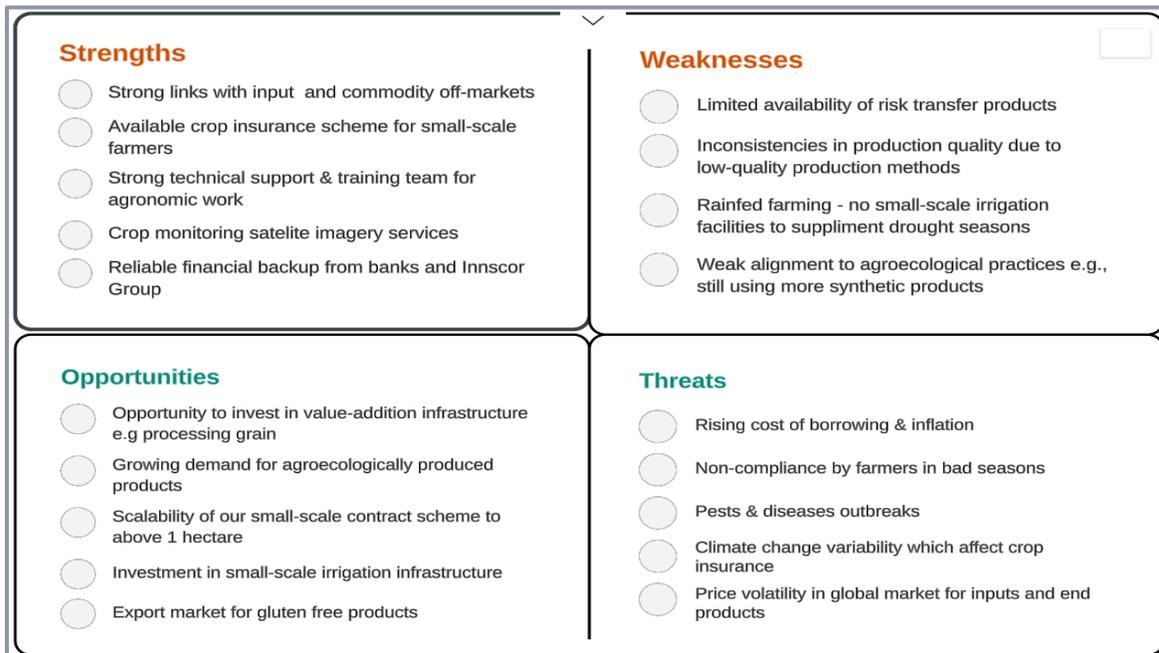


Figure 5. The SWOT Analysis of Agrowth contract farming enterprise.

From the SWOT results, Agrowth can tap into opportunities like value-added processing and the rising demand for agroecologically produced products, potentially expanding into gluten-free and premium export markets. Scaling the contract farming model to cover more land per farmer and improving infrastructure would boost productivity and income. To prepare for economic challenges, Agrowth should implement risk management and compliance programs, incentivize adherence to contracts, and offer financial literacy support to farmers. Building a branding strategy around agroecology can also attract eco-conscious consumers, creating a loyal market for sustainably produced products. These steps will help Agrowth support both the livelihoods of Zimbabwean farmers and agroecological transformation in the region.

Agrowth's contract farming enterprise has a robust foundation strengthened by leveraging its strengths such as strong market and input linkages, crop insurance schemes and technical expertise, and financial backing. However, addressing internal weaknesses like limited risk transfer products, production inconsistencies, reliance on rainfed agriculture, and the need for more sustainable practices, while capitalizing on market opportunities and managing threats, will be crucial for long-term success and agroecological transformation. In addition, the field officer in the field have limited report writing skills and are incapacitated technologically. To strengthen the contract farming

model, the company should capitalize on its established partnerships with input suppliers, access to crop monitoring technology, and crop insurance schemes to enhance farmer productivity and trust. Formalizing these partnerships and utilizing monitoring data to guide best practices can reinforce Agrowth's position and provide stability for farmers.



Figure 6. Effects of El Nino on conventional (right) and conservation sorghum plots in Mbire district.

Addressing weaknesses like the reliance on rainfed farming by investing in small-scale irrigation infrastructure and transitioning towards agroecological practices can reduce vulnerability to drought and improve production quality. Capacity building and knowledge transfer to improve production in organic alternatives and sustainable practices would align Agrowth's operations more closely with agroecological principles, enhancing resilience and soil health.

To seize opportunities and mitigate threats, the model should focus on value addition through local processing facilities, scaling land use for production, and tapping into export markets for gluten-free and agroecologically certified products. This export market is unlocked when there is access supply of sorghum to processors. Risk management measures, including price stabilization mechanisms and pest monitoring systems, are critical to address market volatility and environmental challenges. Additionally, fostering climate resilience through drought-tolerant crop varieties and farmer adaptation training will ensure long-term sustainability. By addressing systemic gaps and aligning incentives across stakeholders, the model can create a scalable and resilient framework for smallholder farmers to thrive while promoting sustainable agricultural practices.

Contribution of current business model

The PHI business model contributes to agroecological principles within territorial food systems as follows:

1. Fair Employment and Income Opportunities for Women, Youth, and Vulnerable Community Members

- Inclusivity in Farmer Selection: Agrowth ensures that women and youth are well-represented in its grower base, providing them with access to production financing, technical training, and guaranteed markets. This approach creates sustainable income opportunities for these often-marginalized groups, helping to improve their economic resilience.
- Employment through Mechanized Operations: Agrowth partnered with CIMMYT to introduce multigrain threshers, which will not only improve the quality of threshed sorghum but also create job opportunities for local farmers who operate the machinery. This employment model provides an additional income stream for local communities while reducing labor-intensive hand threshing.
- Equality of work- through the introduction of multi-crop threshers, men are now able to engage in threshing activities which were regarded as women's and children's tasks.
- Agrowth is an equal opportunity employer which fosters a multicultural work environment with clear values for gender equality.



Figure 7. Sorghum threshing and packaging by men and women farmers in Mbire ward 2 during the 2023/24 season.

2. Local Governance of Resources

- Community-Based Value Addition and Resource Management: Agrowth plans to establish value-addition hubs where farmer produce can be processed locally. This approach will strengthen local governance by keeping more value within the community and creating local market linkages, which enhances economic resilience and control over resources (Arowth Business Invest...).
- Risk Management and Crop Monitoring: The use of weather-indexed insurance and satellite imagery for monitoring crop health fosters a structured approach to risk management. This system enables Agrowth to proactively address crop distress and reduce risks for farmers, which enhances local governance by providing farmers with tools to manage environmental risks effectively.

3. Support for Agroecological Practices

- Reduced Input Dependency and Sustainable Farming Practices: Agrowth supplies seeds and promotes minimal chemical use, encouraging practices that align with agroecological principles like biodiversity and soil health. Sorghum, a climate-resilient crop, also supports the ecological stability of farming regions by withstanding dry conditions and reducing dependency on water-intensive crops like maize.
- Recycling and Synergies within Crop-Livestock Systems: The company encourages farmers to use sorghum stalks for livestock feed or mulching, creating synergies between crop and livestock farming and enhancing soil health through organic matter recycling. This approach aligns with agroecological principles by promoting circular resource use and reducing waste.

Highlights and recommendations

There are some key implications for a stronger agroecological approach for the business enterprise which include:

- **Enhance Biodiversity and Crop Diversity:** Integrate crop diversification strategies beyond sorghum, encouraging mixed cropping or agroforestry to improve ecosystem resilience and provide additional income streams for farmers.
- **Promote Organic Inputs and Reduce Chemical Dependence:** Transition further towards organic pest management and soil fertility practices, reducing any residual reliance on synthetic inputs to align more closely with agroecological principles e.g., cattle manure or compost manure or biochar.
- **Expand Local Governance and Farmer Autonomy:** Strengthen participatory governance by involving farmers more deeply in decision-making and planning to empower them within the contract farming framework, fostering a sense of ownership and adaptive management.
- **Inclusion of Indigenous Knowledge systems:** Create space for Indigenous knowledge from the farming communities to supplement the promoted practices, especially in pests and diseases control, IPM, and post-harvest control.

While the model supports key principles, deeper integration of biodiversity and social values & diets is needed by promoting traditional crops and fostering knowledge sharing on indigenous practices. The current model could also be improved by increasing investments in irrigation infrastructure to reduce climate vulnerability. Addressing these areas would make the contract farming model more agroecological and better suited to sustainable transitions among smallholders.

Business Upgrading Plan

The upgrading plan for Sorghum contract farming aims to improve the resilience and profitability of sorghum production through a focus on farmer productivity, market access, and sustainable practices. Financial mechanisms are tailored to reduce farmer risk and promote inclusive economic growth. Key strategies include providing improved seeds, enhancing access to markets through workshops, and introducing crop insurance to mitigate risks. Village-level mechanization will improve efficiency, while training programs will build farmer capacity in sustainable practices. These measures aim to create a resilient and profitable sorghum farming ecosystem, supporting agroecological transitions and economic diversification.

The upgrading plan for the sorghum contract farming business model is designed to address systemic challenges while fostering agroecological principles to build resilience, improve profitability, and enable sustainable transitions in the sorghum value chain. Farmers require flexible and accessible financial mechanisms tailored to their varying capacities and risk profiles. Most farmers are risk-averse and lack access to formal financial systems due to limited collateral or negative past experiences. Integrating support from Internal Savings and Lending (ISAL) groups and partnerships with microfinance institutions can bridge the gap in production financing. These mechanisms should be designed to cater to smallholder needs, such as input loans with manageable repayment terms. Additionally, leveraging remittances and group-based credit approaches can enhance financial inclusivity. Innovative tools, such as mobile-based platforms, can facilitate transparency and efficiency in managing financial transactions between farmers, financiers, and contractors.

This upgrading plan aims to enhance resilience and profitability of sorghum farming, increase market access, develop farmer capacities on agroecology, increase access to financial services and improve labor productivity. Ultimately, the plan aims to empower smallholder farmers with knowledge, resources, and market opportunities, ensuring their full participation in the value chain. As such, it not only addresses immediate production and profitability goals but also lays the foundation for long-term sustainability and transformation of the sorghum value chain in Mbire district. Table 4 provides the details indicators, time frame, and associated budgets.

Table 4. Upgrading Plan for PHI Agrowth Sorghum Contract Farming.

Objective	Goal	Activity	Indicator	Current Status	Target	Responsible Actors	Supporting Actors	Timeframe	Estimated Costs	Relevant AE Principles
Improve resilience and profitability of sorghum production	Enhance farmer productivity and income from sorghum farming	Provide improved seed and fertilizers to farmers	Number of farmers receiving inputs	50 farmers contracted in 2023/24 season	Double to 100 farmers in 2024/25	Agrowth (Lead)	AARDS, Farmer cooperatives, AEI	Sep 2024 - Mar 2025	\$30,000	Input reduction, co-creation of knowledge
Enhance access to markets for sorghum	Develop and strengthen market linkages with processors like Buffalo Breweries	Conduct farmer-market engagement workshops	Number of workshops held	Minimal engagement with buyers	Conduct 3 workshops by 2025	Agrowth, Buffalo Breweries	Farmer groups, NGOs, AARDS	Oct 2024 - Jan 2025	\$5,000	Connectivity, fairness
Capacity building on AE practices	Build farmer capacity in sustainable sorghum practices	Train farmers on agroecological practices like composting and manure application	Number of training sessions conducted	Basic training in the previous season	Conduct 5 training sessions in 2024/25	Agrowth, AARDS	NGOs, AE-I	Sep 2024 - Feb 2025	\$10,000	Recycling, responsible governance
Improve access to financial services	Reduce risk and financial burden for farmers	Introduce crop insurance and revise repayment models	Percentage of farmers covered by insurance	No insurance in the 2023/24 season	100% coverage for 2024/25	Agrowth	Insurance companies, AE-I	Nov 2024 - Jan 2025	\$15,000	Fairness, resilience
Improve labor efficiency of existing farming methods	Increase mechanization to improve production efficiency	Establish village-level threshing services/business	Number of threshing units operational	No operational units	5 units by 2025	Agrowth	Farmer groups, NGOs	Oct 2024 - Mar 2025	\$20,000	Economic diversification

New business model configuration

Based on the upgrading plan, a new business model canvas for sorghum contract farming was designed bringing in new innovations and practices that foster agroecology transformation at the farm level. Although the newly designed business model canvas is not completely different from the previous one, it aligns well with the 13 agroecological principles, emphasizing sustainability, inclusivity, and resilience within agricultural systems. The model prioritizes connectivity by ensuring inclusive participation, particularly among women and youth, and establishing fair trade relationships supported by guaranteed off-take contracts. Through economic diversification, the model expands market channels to offer diverse income opportunities and includes plans for value-addition facilities that increase local economic participation.

Fairness is embedded in the structure, fostering equity and transparency in decision-making processes. Animal health is supported by utilizing crop by-products as sustainable livestock feed and integrating crop-livestock systems for mutual benefit. Similarly, recycling is incorporated by using sorghum stalks as compost and livestock bedding, which enhances soil organic matter and biodiversity. Biodiversity is promoted through the use of drought-resistant crops and weather-indexed insurance, offering climate resilience and protection against risks.

The model encourages soil health by integrating conservation practices such as minimum tillage and reducing chemical usage to protect soil biodiversity and quality. It supports input reduction by advocating low-input sorghum varieties and encouraging sustainable practices that conserve soil and water. Social values and diets are addressed by promoting culturally significant sorghum, strengthening local food traditions, and integrating markets to support these traditions.

Through the co-creation of knowledge, the model provides agroecological training and knowledge-sharing sessions, incorporating indigenous knowledge on Integrated Pest Management (IPM) and innovations in sorghum production. Land and natural resource governance is emphasized by maintaining accountability to social and environmental standards while operating through collaborative partnerships like contract farming.

Lastly, synergies are created by integrating sorghum by-products as livestock feed and mulch, while also crowding in local service providers to enhance conservation agriculture practices. Participation is a core principle, ensuring equal participation in decision-making, with a focus on empowering women and youth to take adaptive roles in managing food systems. This holistic alignment with agroecological principles demonstrates a robust framework for sustainable, inclusive, and resilient agricultural development.

Table 5. The re-designed business model canvas for sorghum contract farming.

Re-designed Business Model Canvas- Agrowth				
Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
Farmers Finance Institutions Input providers AGRITEX RDC Transporters Grain threshing groups CIMMYT Processors Breweries	Biochar formulations Service providers trainings Farmer selection and monitoring Farmer Capacity Building Input distribution Procurement of output Conservation farming	Guaranteed market for sorghum farmers Improved incomes for the farmers Better payment terms after delivery of crop Access to quality seeds	Good communication including WhatsApp groups Placement of field officer Training of businesses and farmers Regular meetings with farmers and stakeholders like NGOs, Agritex Fulfillment of contract agreement	Breweries Grain Millers (sorghum and Millets) Beer customers (wholesaler to consumers) Feed Companies
	Key Resources		Channels	
	Human resources officer Grain Threshers Motorbike Smartphone Cash		Contract farming Physical meetings Virtual communication through WhatsApp and calls Communication through Agritex and field officers	
Cost Structure			Revenue Streams	
Logistics and distribution Field officers Salaries Cash for sorghum procurement			Sorghum sales to breweries Sale of sorghum dregs to livestock farmers Charging for threshing services Sale of white sorghum	

Cost Benefit Analysis

Cost-benefit analysis was conducted for evaluating the financial and economic viability of Agrowth’s contract farming business model and the farming system proposed by Agrowth PHI. It involved identifying all production and operational costs, including inputs like seeds, fertilizers, and labor, alongside post-harvest processing and transport expenses. Revenue was estimated based on the yield per hectare and agreed prices under contract terms. The analysis accounted for risks such as weather variability and market fluctuations, while benefits were measured in terms of profitability, risk reduction through guaranteed offtake, and economic gains for both farmers and buyers. Sensitivity analysis was conducted to assess the impact of price and yield variations, providing a comprehensive understanding of the model’s sustainability and scalability.

Net Present Value Test

To analyze the Agrowth sorghum contract farming, a discount rate of 15% was used to discount the cashflows – to match current lending rates in Zimbabwe. The results of the Net Present Value (NPV) tests for the Agrowth Farming model are summarised in Table 6. The results of the NPV tests showed positive values, despite a negative net cash flow in year one due to the El Nino-induced drought. This indicates the business model's financial viability over the project lifecycle. However, the NPV method has limitations, including reliance on input parameters like future cash flows, timing, project duration, initial investment, and discount rates. It fails to reflect variations in risk over time, excludes non-financial metrics like social and environmental impacts, and does not consider project size or hidden costs.

Table 6. NPV Test for the Sorghum Contract Farming Business Model.

Agrowth Sorghum Contract Farming Model		
Period/Year	Cashflow	NPV
1	(\$27,938.00)	(\$24,293.91)
2	\$2,168.00	\$1,639.32
3	\$8,058.00	\$5,298.27
4	\$35,826.00	\$20,483.63
5	\$63,238.00	\$31,440.46
Total		\$34,567.77
Initial Investment		\$8,825.00
NPV of Sorghum CF Business Model		\$25,742.77

Gross Margin Analyses and Cashflow Projection

Farmer Gross Margin Analysis Comparison

We calculated the Gross Margin Analysis (GMA) for an Agrowth-supported farmer with a Mbire farmer continuing with the status quo on a 1-ha plot. With Agrowth support, the farmer will receive improved seed, input support, and insurance cover and will be able to attain a high yield of 2.5 MT/ha. If a farmer continues with the status quo, it is assumed that retained seed will be used with no applied fertilizer, resulting in low yields of 0.8 MT/ha. The GMA summarized results (Table 7) show that the Agrowth-supported contract farming model significantly improves farmers' profitability, increasing their gross margin to **USD 226/ha**, compared to **USD 31/ha** under the status quo. Full GMA results in Annex 1.

Table 7. Sorghum Production Gross Margin Analysis (GMA) Comparison.

Scenario	Yield (MT/ha)	Revenue (USD/ha)	Cost (USD/ha)	Gross Margin (USD/ha)
Agrowth-supported Farmer	2.5	375	149	226
Farmer with Traditional Practices	0.8	120	89	31

Cash flow projections

The Agrowth sorghum contract farming model, assessed over five years, demonstrated increasing profitability despite an initial shortfall due to high start-up costs and low yields (0.08 MT/ha in Year 1) (Table 8). Production scaled from 50 hectares in Year 1 to 500 hectares in Year 5, with yields improving to 4 MT/ha. Total output rose from 4 tons in Year 1 to 2,875 tons in Year 5, generating a cumulative income of \$1,362,450. Net sales income steadily increased from \$3,700 in Year 1 to \$577,500 in Year 5, with cumulative net sales of \$1,173,450.

Expenditures included input loans, farmer profit payouts, capital investments (e.g., threshers, storage, and knapsacks), and administrative costs such as staffing and logistics. While significant capital expenditures occurred in the early years, operating costs remained relatively stable, contributing to a cumulative operating net cash excess of \$47,987. After accounting for CAPEX and administrative costs, the Agrowth crop margin net of expenditures grew from a loss of \$5,418 in Year 1 to a profit of \$63,238 in Year 5. The cumulative cash balance, initially negative, reached a positive \$81,352 by the end of Year 5, reflecting the long-term viability of the model.

Table 8. Summarized Cashflows projections with AEI Grant support.

Year	Target Area (Ha)	Yield (MT/Ha)	Total Output (Tons)	Total Income (USD)	Net Sales Income (USD)	Net Margin (USD)	Cumulative Cash (USD)
Year 1	50	0.08	4	1,200	3,700	(5,418)	(27,938)
Year 2	100	3.0	300	99,000	82,500	2,168	(25,770)
Year 3	200	3.5	700	231,000	198,000	8,058	(17,712)
Year 4	300	3.75	1,125	371,250	321,750	35,826	18,114
Year 5	500	4.0	2,000	660,000	577,500	63,238	81,352

Investment needs for scaling

Investments and Funding Needs

The Agrowth sorghum contract farming business requires a total investment of \$472,217 over five years, broken down into input funding, capital expenditure, and administration costs. The bulk of funding is directed toward scheme inputs (\$380,006), which include seeds, fertilizers, and other operational needs. Capital expenditures (\$27,150) cover essential infrastructure such as threshers, tractors, and storage, while administration expenditures (\$45,061) account for coordination, logistics, and staffing. The business anticipates covering these costs primarily through debt financing (\$452,217) and grant support (\$20,000) in Year 2, which plays a crucial role in stabilizing operations after initial challenges.

Financial Performance

The business experienced a deficit in its pilot year due to drought, resulting in the absence of funding for scheme inputs and operational inefficiencies. However, starting in Year 2, gross farmer profit is poised to steadily increase from \$41,317 to \$371,585 by Year 5, indicating a successful recovery and growth trajectory. The profit per hectare also improves significantly, from \$413 in Year 2 to \$3,554 by Year 5, reflecting the impact of improved yields and economies of scale. By Year 5, 280 farmers are expected to benefit from the scheme, contributing to a substantial increase in output and income.

Table 9. Investment Needs.

Funding Requirements Breakdown	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Cost funding the scheme inputs	\$	\$36,503	\$ 71,134	\$103,893	\$168,476	\$380,006
Capital Expenditure	\$-	\$6,650	\$15,300	\$1,950	\$3,250	\$ 27,150
Administration Expenditure	\$ -	\$7,682	\$9,642	\$11,725	\$ 16,012	\$45,061
Total Requirements - Debt Financing	\$ -	\$ 50,835	\$ 96,076	\$117,568	\$187,738	\$452,217
Grant Support	\$ -	\$20,000	\$-	\$	\$ -	\$20,000
Combined Funding Requirements	\$	\$70,835	\$96,076	\$117,568	\$187,738	\$472,217
Approximate Number of Farmer Beneficiaries		\$100	\$150	\$190	\$280	\$280
Gross Farmer Profit		\$41,317	\$115,634	\$198,201	\$371,585	\$371,585
Approximate Profit Obtained by each farmer per hectare		\$413	\$771	\$1,043	\$1,327	\$3,554

The business faces notable risks:

- **Farmer and Shareholder Engagement:** After a loss in the pilot year, shareholders may be reluctant to continue funding the scheme, and farmers might lose trust and motivation to participate. This creates a risk of scheme discontinuation, which could jeopardize the long-term success of the business.
- **Drought Impact:** The effects of El Nino-induced drought highlight the vulnerability of the business to climatic shocks, making financial and operational resilience critical for sustainability.

The business has ambitious quantitative and qualitative growth targets:

- **Quantitative growth:** Increasing hectareage from 50 hectares in Year 1 to 500 hectares by Year 5, raising the number of participating farmers to 280, and improving yields from 0.08 MT/ha (pilot) to 4 MT/ha by Year 5.
- **Qualitative growth:** Enhancing farmer profitability per hectare, which grows from \$413 in Year 2 to \$3,554 by Year 5, reflecting improved productivity, training, and input support.

Conclusions and Recommendations

The sorghum contract farming business model implemented in Mbire district demonstrated its capacity to bridge market access and production support gaps for smallholder farmers while introducing elements of agroecological principles. Through partnerships with stakeholders such as CIMMYT, financial institutions, and local agronomic advisors, the model facilitated improved access to high-quality seeds, technical training, and guaranteed market linkages. These elements were essential for enhancing productivity and economic opportunities and adapting to drought-tolerant crops. However, the diagnostic and implementation processes underscored critical areas requiring improvement to ensure a better alignment with agroecological principles and long-term sustainability. The partial adherence to agroecological practices, as evidenced by the B-ACT results, highlighted areas for growth, including resource recycling, biodiversity enhancement, and equity-focused interventions.

Several risks and challenges emerged during the project's lifecycle. Climate variability, particularly drought, substantially threatened productivity and farmer incomes, emphasizing the need for risk management strategies, climate-resilient practices, and water and irrigation infrastructure for smallholder production systems. Additionally, limited adoption of sustainable practices, minimal financial inclusivity, and gaps in participatory governance frameworks reduced the model's potential to drive systemic change. Lessons learned include integrating diverse stakeholders, especially marginalized groups such as women and youth, into decision-making and capacity-building initiatives. It also became evident that deeper incorporation of indigenous knowledge and agroecological innovations is vital for creating resilient and adaptable farming systems. While the model has advanced economic benefits for participating farmers, its full agroecological and systemic transformation potential remains untapped, requiring further investment and strategic refinement.

Based on the findings from the business model development, assessments, and upgrading needs, the following are the recommendations:

- **Deepen Agroecological Integration and Biodiversity:** by focusing on promoting diverse cropping systems, such as intercropping sorghum with legumes or integrating agroforestry practices, to enhance ecosystem resilience while providing farmers with diversified income opportunities. Transitioning to organic inputs, including biofertilizers, compost, and biochar, will reduce reliance on synthetic inputs and improve long-term soil health. Additionally, fostering synergies between crop and livestock systems, such as utilizing sorghum by-products for livestock feed or soil amendments, can create circular resource use that strengthens ecological stability and productivity.
- **Expand Farmer Capacity Building and Participatory Approaches:** building farmers' capacity in agroecological practices is essential to achieving sustainable transitions, and this can be achieved through scaling up training programs on Integrated Pest Management (IPM), soil fertility management, and water conservation techniques. Establishing farmer field schools, participatory workshops, and knowledge-sharing platforms will integrate scientific innovations with indigenous knowledge, ensuring localized solutions. Furthermore, creating farmer-led governance structures will empower marginalized groups, particularly women and youth, to participate actively in decision-making and co-create adaptive farming strategies.
- **Holistic systems approach to agroecology:** to enhance agroecological alignment in sorghum farming, a holistic systems approach is essential, recognizing farms as interconnected ecosystems rather than focusing solely on sorghum production. This involves integrating crop rotations and intercropping (e.g., with legumes) to improve biodiversity, soil health, and resilience while diversifying incomes. Incorporating livestock enhances soil fertility, nutrition, and income streams. Regenerative practices like cover cropping

and organic amendments can restore soil health, while participatory trials allow testing synergies between crop and livestock systems. Understanding farmers' total incomes and limitations ensures tailored solutions that address livelihoods comprehensively. This approach promotes resilience, equity, and sustainability, aligning production systems with agroecological principles.

- **Enhance Financial Accessibility and Risk Management:** mitigate economic vulnerabilities, the model should introduce climate-resilient financial products, such as weather-indexed crop insurance, area yield insurance and credit facilities tailored to the unique needs of smallholders. Partnering with microfinance institutions, internal savings and lending groups (ISALs), and leveraging digital platforms will simplify access to financing and improve transparency in loan repayment processes. Implementing price stabilization mechanisms will further protect farmers from market fluctuations, ensuring stable incomes and increasing their willingness to adopt agroecological practices.
- **Invest in Climate-Resilient Infrastructure:** reducing dependence on rainfed farming requires investing in small-scale irrigation systems to mitigate risks associated with drought and water scarcity. Developing localized storage and processing facilities will reduce post-harvest losses, improve operational efficiency, and enable farmers to produce value-added products with higher market value. Expanding mechanization, such as introducing multigrain threshers, will not only enhance grain quality and labor productivity but also create rural employment opportunities, driving economic growth in farming communities.
- **Refine and Scale the Business Model:** the AEI should continuously monitor and refine the business model to align with agroecological principles, with periodic evaluations of the B-ACT. Low-impact interventions, such as reliance on synthetic fertilizers, should be reduced and/or substituted with sustainable practices that enhance soil health and biodiversity. To maximize economic opportunities, the business model should target niche markets, including gluten-free and export segments, by leveraging eco-conscious branding, traceability systems, and certifications that emphasize the environmental benefits of agroecologically produced sorghum.

Annexes

Annex 1

Table 1: Sorghum Production GMA Comparison

Sorghum with Agrowth Support					Planned Hectares		
					1		
				Inputs/Ha	USD\$ Unit Cost	USD\$/Ha	Total USD\$
OPERATIONAL COSTS BREAKDOWN	Seed	kgs	12.5	3	US\$38	US\$38	
	Compound D	kgs	100	0.57	US\$57	US\$57	
	AN	kgs	75	0.75	US\$56	US\$56	
	Lime	kgs	300	0.115	US\$35	US\$35	
	Soil Sampling	kgs		0	US\$0	US\$0	
	Chemicals	\$	1	58	US\$58	US\$58	
	Combine Hire		0	0	US\$0	US\$0	
	Transport to Farm		1	0	US\$0	US\$0	
	Transport from Farm		2.5	87.5	US\$88	US\$88	
	Packaging		2.5	17.5	US\$18	US\$18	
	Insurance		1.05%	7.9	US\$8	US\$8	
	TOTAL OPERATIONAL COSTS					US\$357	US\$357
Interest:		Months to Maturity	4	Annual Rate	15%	US\$18	
OPERATIONAL COSTS PLUS INTEREST						US\$374	
REVENUE	Yield	tons/hectare	2.5	1			
	Selling Price/Ton	\$	US\$300	1		US\$300	
	REVENUE						US\$750
	Agrowth Scheme Running Cost	tons/hectare	0.5			US\$150	
	OPERATIONAL COST PLUS INTEREST						US\$374
	FARMER GROSS MARGIN						US\$226
Farmer Breakeven Tonnage						1.75	
Farmer Breakeven Price						US\$210	

Table 2: Sorghum without Agrowth Support

Sorghum without Agrowth Support					Planned Hectares	
OPERATIONAL COSTS BREAKDOWN	Inputs/Ha	USD\$ Unit Cost	USD\$/Ha		1	
					Total USD\$	
	Seed	kgs 12.5	0.3	US\$4		US\$38
	Compound	kgs 0	0.57	US\$0		US\$0
	AN	kgs 0	0.75	US\$0		US\$0
	Lime	kgs 0	0.115	US\$0		US\$0
	Soil Sampl	kgs 0	0	US\$0		US\$0
	Chemical	\$ 0	58	US\$0		US\$58
	Combine Hire	0	0	US\$0		US\$0
	Transport to Farm	0	0	US\$0		US\$0
Transport from Farm	0.8	28	US\$28		US\$88	
Packaging	0.8	5.6	US\$6		US\$18	
Insurance	0.00%	0.0	US\$0		US\$8	
TOTAL OPERATIONAL COSTS				US\$37	US\$209	
Interest: <i>ths to Mat.</i>		Annual Rate			US\$0	
4		15%				
OPERATIONAL COSTS PLUS INTEREST					US\$209	
REVENUE	Yield	<i>s/hectare</i> 0.8	1			
	Selling Pri	\$ US\$300	1		US\$300	
	REVENUE					US\$240
	Agrowth	<i>s/hectare</i> 0.5			US\$0	
	OPERATIONAL COST PLUS INTEREST					US\$209
FARMER GROSS MARGIN					US\$31	
Farmer Breakeven Tonnage					0.70	
Farmer Breakeven Price					US\$261	

Annex 2. Cashflow Projections

		Year 1	Year 2	Year 3	Year 4	Year 5	Total
Income							
Target area under production (Ha)	hectares	50	100	200	300	500	1150
Target Yield Per Hectare		2.5	3	3.5	3.75	4	
Obtained Yield Per Hectare		0.08					
Total output	tons	4	300	700	1,125	2,000	2,875
Selling price/ton	price/ton	\$ 300	\$ 330	\$ 330	\$ 330	\$ 330	
Total income from sorghum sales		\$ 1,200	\$ 99,000	\$ 231,000	\$ 371,250	\$ 660,000	\$ 1,362,450
Grant Financing		\$ 10,000					
Extension cost of running the scheme		\$ 7,500	\$ 16,500	\$ 33,000	\$ 49,500	\$ 82,500	\$ 189,000
Net Sales Income		\$ 3,700	\$ 82,500	\$ 198,000	\$ 321,750	\$ 577,500	\$ 1,173,450
Expenditures							
Cost of funding the contract farming	Input loan	\$ 18,720	\$ 36,503	\$ 71,134	\$ 103,893	\$ 168,476	\$ 398,726
Farmer Profit Payout		\$ -	\$ 41,317	\$ 115,634	\$ 198,201	\$ 371,585	\$ 726,737
Operating Net Excess Cash / (Shortfall) Before CAPEX and Admin		\$ (15,020)	\$ 4,680	\$ 11,232	\$ 19,656	\$ 37,439	\$ 47,987
Equipment Costs							
Motor bike and rider's kit for project coordinator	Motor bike	\$ 1,500	\$ -	\$ -	\$ -	\$ -	\$ 1,500
Grain Threshers X 2 (1.5 tons/hr/thresher)	Thresher	\$ 5,200	\$ -	\$ -	\$ -	\$ -	\$ 5,200
Scheme Tractor	Scale	\$ -	\$ -	\$ 14,000	\$ -	\$ -	\$ 14,000
Storage Shade		\$ -	\$ 6,000	\$ -	\$ -	\$ -	\$ 6,000
Knapsacks \$13/Knapsack	Knapsack	\$ -	\$ 650	\$ 1,300	\$ 1,950	\$ 3,250	\$ 7,150
Total CAPEX		\$ 6,700	\$ 6,650	\$ 15,300	\$ 1,950	\$ 3,250	\$ 33,850
Monthly Overhead Costs							
Staff							
Project coordinator		\$ 4,800	\$ 4,800	\$ 4,800	\$ 4,800	\$ 4,800	\$ 24,000
Security Guards X 2 [Inputs and Harvest Crop Storage - 2 months]		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Crop Handlers at harvest [\$1.5/Ton]		\$ 6	\$ 450	\$ 1,050	\$ 1,688	\$ 3,000	\$ 6,194
Logistics							
Motorbike Diesel [30 Litres/Month]		\$ 612	\$ 612	\$ 612	\$ 612	\$ 612	\$ 3,060
Grain and Equipment Storage Building Rental [\$100/month]		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Thresher Diesel Costs [3litres/hour for 8hp engine at full throttle]		\$ -	\$ 1,020	\$ 2,380	\$ 3,825	\$ 6,800	\$ 14,025
Motorbike servicing		\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 1,000

Other costs						
Communication cost for Project Coordinator [\$50/Month]	\$ 600	\$ 600	\$ 600	\$ 600	\$ 600	\$ 3,000
Administration Costs	6,218	7,682	9,642	11,725	16,012	51,279
Total CAPEX and Admin Expenditure	\$ 12,918	\$ 14,332	\$ 24,942	\$ 13,675	\$ 19,262	\$ 85,129
Total Expenses	\$ 12,918	\$ 14,332	\$ 24,942	\$ 13,675	\$ 19,262	\$ 85,129
Agrowth Crop Margin Net of CAPEX and Admin Expenditure	\$ (5,418)	\$ 2,168	\$ 8,058	\$ 35,826	\$ 63,238	\$ 103,872
Cumulative Cash Balance	\$ (27,938)	\$ (25,770)	\$ (17,712)	\$ 18,114	\$ 81,352	

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