

# Inclusive Seed Systems for East and Southern Africa: Insights from Vuna Innovation Models in East and Southern Africa

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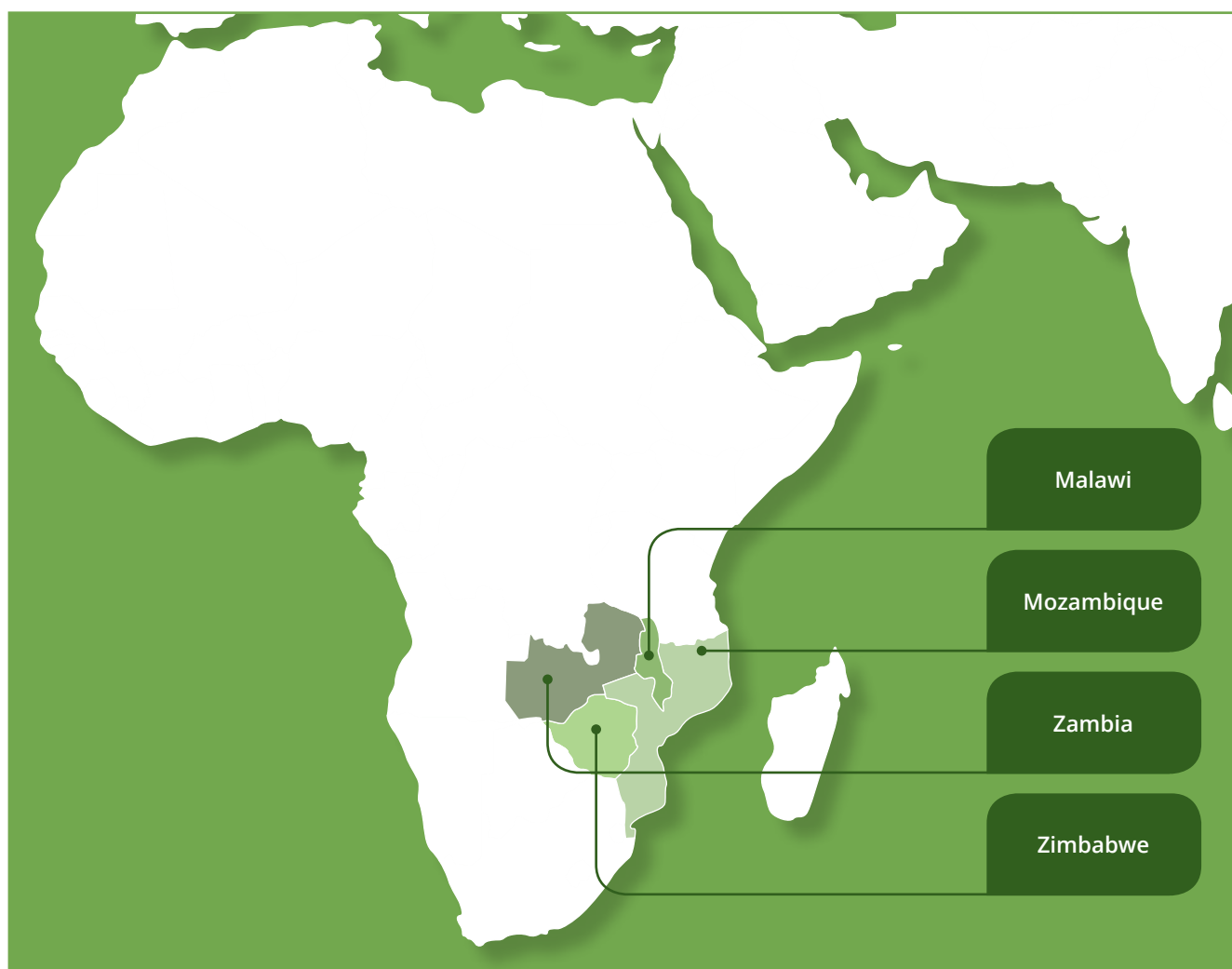
# Preface

This paper forms part of a set of three thematic papers that draw from action research conducted on the approaches used in implementing Climate Smart Agriculture (CSA) innovation models in East and Southern Africa (ESA) by Vuna, a DFID funded regional CSA programme managed by Adam Smith International. Categorized in various agriculture related themes, the papers explore different models designed to promote the uptake of CSA practices among smallholder farmers. The thematic papers assess the various approaches that Vuna employed to improve CSA adoption. The implementation period of the Vuna innovation models was short, ranging between 9 and 12 months. Consequently, the findings contained herein are based on emerging insights and early signs of potential of the innovation models to support resilience building in a scalable and sustainable manner.

This series of the thematic model papers include:

- Integrating Climate Smart Agriculture into Outgrower Models: Insights from Vuna Innovation Models in East and Southern Africa;
- Private Sector Driven Extension Models for Smallholder Farmers: Insights from Vuna Innovation Models in East and Southern Africa; and,
- Inclusive Seed Systems: Insights from Vuna Innovation Models in East and Southern Africa (this paper).

The research was conducted between October 2017 and February 2018, in three phases. First, available literature on CSA, climate change and agriculture in the focus country and within the region was reviewed. Second, desktop research of Vuna project documents (baseline reports, quarterly reports, grant application(s), and the Vuna project plan) was done. Third, field research was conducted to assess the extent to which the innovation model has been adopted and whether it's being adapted to enhance desirable outcomes for key value chain actors. Field research results were analysed to determine the potential for the sustainability of the interventions.



# Acronyms

<b>AWAB</b>	African Women in Agribusiness	<b>OPV</b>	Open-Pollinated Variety
<b>CIAT</b>	Center for Tropical Agriculture	<b>RECs</b>	Regional Economic Communities
<b>CSA</b>	Climate Smart Agriculture	<b>SCCI</b>	Seed Control and Certification Institute
<b>CSA GLEE</b>	Climate-Smart Agriculture Global Learning and Evidence Exchange	<b>SME</b>	Small and medium sized enterprises
<b>COMESA</b>	Common Market for Eastern and Southern Africa	<b>SCF</b>	small commercial farmer
<b>CGIAR</b>	Consultative Group on International Agricultural Research	<b>SBS</b>	Sociedade Beneficiamento Sementes
<b>EGS</b>	Early generation seed	<b>SADC</b>	Southern African Development Community
<b>ESA</b>	East and Southern Africa	<b>TNS</b>	Technoserve
<b>ECOWAS</b>	Economic Community of West African States	<b>DFID</b>	The United Kingdom's Department for International Development
<b>IITA</b>	International Institute of Tropical Agriculture	<b>ZSS</b>	Zimbabwe Super Seeds
<b>FISP</b>	Farmer Inputs Support Program	<b>AWAB</b>	African Women in Agribusiness
<b>CIMMYT</b>	International Maize and Wheat Improvement Center  Spanish: Centro Internacional de Mejoramiento de Maíz y Trigo	<b>CIAT</b>	Center for Tropical Agriculture
<b>NGO</b>	Non-Governmental Organisation	<b>CSA</b>	Climate Smart Agriculture



Vuna means 'harvest' in many languages in East and Southern Africa. Our name like our work is inspired by the region.



# Executive summary

Improving the delivery of high quality, adaptable seed to farmers is among the most important climate smart investments in East and Southern Africa (ESA). Farmers, however, still face significant logistical, cost, availability, and suitability challenges leaving them with no option but to use retained crop as seed. Even with more than 30 regional and multinational seed companies operating in the region, delivery systems for seeds are still underdeveloped. Intra-regional seed trade also remains limited, mainly due to phytosanitary concerns, despite recent seed trade harmonization guidelines negotiated through the three Regional Economic Communities (RECs). Efforts to adapt farming systems and the realisation of the role of seed systems in this regard have prompted the emergence of a climate resilience focused seed sector that is positioning seed as an integral part of the solution. Small to medium sized seed companies that focus on multiplication of climate resilient seed varieties, particularly for open pollinated varieties (OPVs) of maize, and self-pollinating small grains are seeking to improve access to climate resilient seed, through inclusive business models that partner with smallholder farmers in seed multiplication, and agro-dealer networks in marketing.

Using evidence from three inclusive, resilience focused seed business models in Malawi, Mozambique, Zambia, and Zimbabwe that received financial support from Vuna, a DFID funded Climate Smart Agriculture (CSA) program for ESA, this paper assesses whether these models have contributed to resilience building for smallholder farmers and the broader seed market system. The analysis also looks at the sustainability of these business models and the extent to which they can be scaled up.

Findings of the review point to two broad typologies that are based on the level of their integration and strength of partnerships with key value chain actors and the nature of their buy back relationship with farmers: (i) Integrated model; and, (ii) Informal/fragmented model.

Integrated models have significant potential to build resilience. The most defining feature of seed businesses founded on the 'integrated model' is that they operate on the basis of highly integrated and inclusive partnerships with key value chain actors such as smallholder farmers, breeders of early generation seed (EGS), relevant government seed institutions, agro-dealers and retailers. Through these partnerships, the seed company sources foundation seed from breeders of EGS, which is multiplied by farmers, processed by the company into certified seed, and marketed through networks of agro-dealers and retailers. This typically results in well established, long term, and mutually beneficial partnerships between the company and these value chain actors. The long term nature of the partnership encourages the seed company to invest in providing training and on-going extension support to its partners, especially farmers.

Although most of the businesses that were reviewed are still in their foundational stages, those that have adopted the integrated business model show strong signs of contributing to resilience building of farmers by creating consistent and lucrative market opportunities that boost incomes and enable subsequent investments in productivity enhancing inputs and resilience building assets.

The sustainability of businesses employing the informal/fragmented model is doubtful. Seed businesses that are based on the informal model typically resort to informal, non-committal, inconsistent, and sometimes less transparent arrangements with farmers and other seed value chain actors. While the intent to buy back seed is often there, working capital financing to purchase seed from farmers is the most pressing bottleneck. The limited capacity of these seed businesses to provide support to farmers and honour their informal buy back commitments to farmers has undermined their reputation with farmers who regularly suffer losses when they resort to selling their seed as an ordinary commodity crop at a far much lower price. The resilience building contribution of undercapitalised business models in this category is negligible if not non-existent as they are failing to consistently improve yields, market opportunities and incomes, and the uncertainty of non-committal buy back arrangements often puts farmers' livelihoods at risk. The sustainability of businesses in this category is also highly doubtful due to a poor reputation among farmers and other market players.

The poor performance of seed businesses who have adopted the informal model has motivated some seed grower cooperatives to seek a transition into farmer owned cooperative seed companies. Although this shift from seed producer groups to cooperative seed companies is in its infancy, farmers are optimistic about its prospects of improving the marketing of their seed. The success of such business models will, however take well organised and well trained cooperatives, who are linked to support services, and knowledgeable about the processes of the seed value chain. Challenges of poor governance and lack of financial management competencies that are common among farmer cooperatives are some of the setbacks that threaten farmer managed seed companies.

# 1 Introduction

Improving access to high quality, climate resilient seed is among the most promising climate smart solutions for smallholder farmers in East and Southern Africa (ESA). The majority of smallholders in the region typically use retained crop as seed for most of their crops, leading to a spiral of declining and significantly variable yields due to adverse weather patterns and damage from pests and diseases. Mozambique demonstrates the extent to which improved seed utilisation is particularly low. Here, smallholder farmers constitute 97% of farmers, and only 10% utilise improved seed. Deteriorating agro-ecological conditions faced by farmers in the region, due to climate change related patterns such as declining or erratic rainfall, shorter growing seasons, and rising temperatures are set to reduce yields even further. As such, breeding quality seed and improving its delivery to farmers is an important investment area for CSA, offering farmers opportunities to respond to climate change.

Although the benefits of using certified seed are now widely appreciated, particularly for maize due to sustained investment in research and extension as well as aggressive marketing, smallholder farmers still face significant constraints in accessing quality seed for most major crops. Even with more than 30 regional and multinational seed companies<sup>1</sup> operating in the region, delivery systems for seeds are still underdeveloped in much of ESA.

For a number of reasons, the majority of smallholder farmers still battle to access quality certified seed for major crops. First, seed systems in many parts of ESA often do not work. On one hand, there is a supply-demand gap in seed production and availability, relative to demand and national requirements particularly for climate resilient crops and varieties (see Table 1). On the other hand, there is a logistical gap as smallholder farmers in remote locations face significant transactions cost and logistical difficulties in reaching retail outlets that stock certified seed. This is worsened by the poor state of transport and communication infrastructure that service most farming communities. Secondly, the price of certified seed remains beyond the budgets of most smallholder farmers who largely self-finance their production from meager savings. Poor yields and frequent crop losses due to adverse climatic conditions further erode any incentives as well as the capacity of these farmers to purchase quality seeds, forcing them to resort to using grain retained from the previous season as seed. Thirdly, the bias towards maize due to its status as the main staple crop in the region, and its dominance in large-scale commercial agriculture, has undermined investment in the development and commercialization of seed for some crops such as self-pollinating small grains (e.g. sorghum and millet) and legumes (e.g. beans, pigeon peas, and cowpeas) that are important in smallholder systems. Often perceived as less lucrative for large seed companies compared to maize hybrids, seed for small grains and legumes is rarely available on the formal market. Lastly, cases of bogus seed are not uncommon in some countries. The liberalisation of the seed sector in the 1990s encouraged the entry of numerous national and multinational seed companies in most ESA countries.<sup>2</sup> While this has increased the choice of crop varieties available to farmers, this expansion also resulted in a rise in counterfeit seed. Loopholes in regulatory systems have resulted in farmers being duped into buying 'certified' seed from unscrupulous dealers whose source and authenticity cannot be verified. As a result, farmers have suffered major losses due to poor germination, poor yields, pest and diseases infestation. The cost implications associated with such experiences contribute to the farmers' lack of confidence in certified seeds hence opting to use retained grain as seed instead.

## For farmers in ESA climate risk relates to the following:

- Droughts, mid-season dry spells and/or floods;
- earlier, or later, rains; earlier, or later, cessation of rains;
- new diseases; new weeds;
- new pests, change in populations or time of infestation;
- post-harvest/storage losses;
- soil changes, e.g. increasing salinity;
- changes in quality of rangeland and other sources of livestock feed.



**“Seed systems in sub Saharan Africa often don’t work at all. The science is far ahead of our ability to deliver it.”**

*Aline O'Connor, USAID CSA GLEE March 14, 2016 (Climate-Smart Agriculture Global Learning and Evidence Exchange (CSA-GLEE))*

1 Agri Experience, 2016

2 Kamfwa, 2016



- Harmonize phytosanitary measures for seed in the region in order to facilitate the safe movement of seed within Member States, in a transparent manner and without dissemination of any pest of quarantine importance
- Ensure that varieties listed in the COMESA Variety Catalogue and traded among Member States are of high and known quality and that movement of seed is more efficient
- Encourage investment in seed business in the Member States
- Increase access to existing varieties in the Member States; and,
- Stimulate the breeding and availability of improved seed varieties resulting in increased variety choices for all farmers

**Box 1:** Objectives of the COMESA seed trade harmonization framework

**Table 1:** FAO estimate of seed availability and demand for 2016-2017 (MT)

Country		Maize	OPV Maize	Cowpea	Groundnut	Sorghum	Pigeonpea	Pearl millet
Malawi	Availability	17,130	N/A	325	2,106	N/A	605	N/A
	Requirements <sup>1</sup>	32,935	N/A	1,287	9,599	N/A	2,464	N/A
	<b>Gap</b>	<b>15,805</b>	<b>N/A</b>	<b>962</b>	<b>7,493</b>	<b>N/A</b>	<b>1,589</b>	<b>N/A</b>
Mozambique	Availability	1,330	N/A	84	78	2	82	N/A
	Requirements <sup>2</sup>	9,245	N/A	1,849	1,387	2,850	693	N/A
	<b>Gap</b>	<b>7,915</b>	<b>N/A</b>	<b>1,765</b>	<b>1,309</b>	<b>2,848</b>	<b>611</b>	<b>N/A</b>
Zambia	Availability	77,885	N/A	400	751	478	N/A	2
	Requirements <sup>1</sup>	27,465	N/A	108	17,836	233	N/A	537
	<b>Gap</b>	<b>0<sup>3</sup></b>	<b>N/A</b>	<b>0</b>	<b>17,085</b>	<b>0</b>	<b>N/A</b>	<b>535</b>
Zimbabwe	Availability	44,152	N/A	310	110	1,300	N/A	120
	Requirements <sup>4</sup>	37,500	N/A	4,000	2,500	2,500	N/A	2,900
	<b>Gap</b>	<b>6,652</b>	<b>N/A</b>	<b>3,690</b>	<b>2,390</b>	<b>1,200</b>	<b>N/A</b>	<b>2,780</b>
Tanzania	Not included in FAO assessment							

**Source:** FAO assessment on seed and other agricultural inputs in Lesotho, Madagascar, Malawi, Mozambique, Swaziland, Zambia and Zimbabwe,



Until recently, regional seed trade has been largely unexplored, mainly due to phytosanitary concerns. Recent seed trade harmonization guidelines negotiated through the three Regional Economic Communities (Common Market for Eastern and Southern Africa (COMESA), Southern African Development Community (SADC) and West African Economic Community (ECOWAS)<sup>3</sup> are expected to significantly improve intra-regional trade, smoothening the availability of seed.

In the last decade, deteriorating climatic conditions in many parts of ESA prompted questions on the suitability of most varieties of hybrid maize currently on the market. Even some of the so-called 'drought tolerant' or 'early maturing' varieties have failed to measure up to the increasingly drier and hotter climatic conditions faced by farmers. While some of the non-performing varieties have already been withdrawn particularly for maize, some poor performing seed varieties remain on the market due to non-existent or weak mechanisms for quality assurance.

Although climate change brings numerous challenges, it has also created new business opportunities. The emergence of a climate resilience focused seed sector is an example of such opportunities. The climate challenge is driving innovation and ingenuity from seed companies that are positioning seed as an integral part of the solution. The emergence of small to medium sized seed companies that focus on multiplication of climate resilient seed for OPVs of maize, self-pollinating sorghum, millet, and legumes (groundnuts, sugar beans and cowpeas) is presenting a new dimension of climate smart solutions. Not only are these seed companies seeking to improve access to climate resilient seed, many have also adopted inclusive business models in which they partner with smallholder farmers in seed multiplication, and agro-dealer networks in seed marketing. These business models are incorporating smallholder farmers into the highly lucrative seed value chain, bringing new income opportunities and diversifying local livelihoods. Partnerships with agro-dealers are improving local availability of seed by overcoming 'the last mile' constraints faced by smallholders. A thriving network of agro-dealers is also deepening local economic activity, including opportunities for aggregation services for local farmers.

This paper draws on 11 climate resilience focused seed business models in ESA, to assess whether they have the potential to contribute to resilience building for smallholder farmers and the broader seed market system. The analysis also assesses the sustainability of these business models and the potential for scaling up operations. The 11 business models received funding support from Vuna, a DFID funded CSA program for ESA, to improve access to high quality, climate resilient seed in Malawi, Mozambique, Zambia, and Zimbabwe.



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3 COMESA, 2014

## 1.1 Overview of seed systems in ESA

Seed systems in ESA have undergone significant transformation in the last decade, leading to a diverse sector with small, medium and large private companies, largescale and smallholder farmers, as well as governmental and non-governmental stakeholders. The most significant shift, however, relates to the inclusion of smallholder farmers in seed multiplication and the engagement of agro-dealer networks in seed marketing. Figure 1 summarises some of the key stakeholders in these seed systems, their roles and how they interact with smallholder farmers and agro-dealers. In addition to smallholder farmers and seed companies, other key players include EGS producers such as breeders in CGIAR center and national research institutes, the government seed inspectorate services, extension agencies, retailers and agro-dealers.

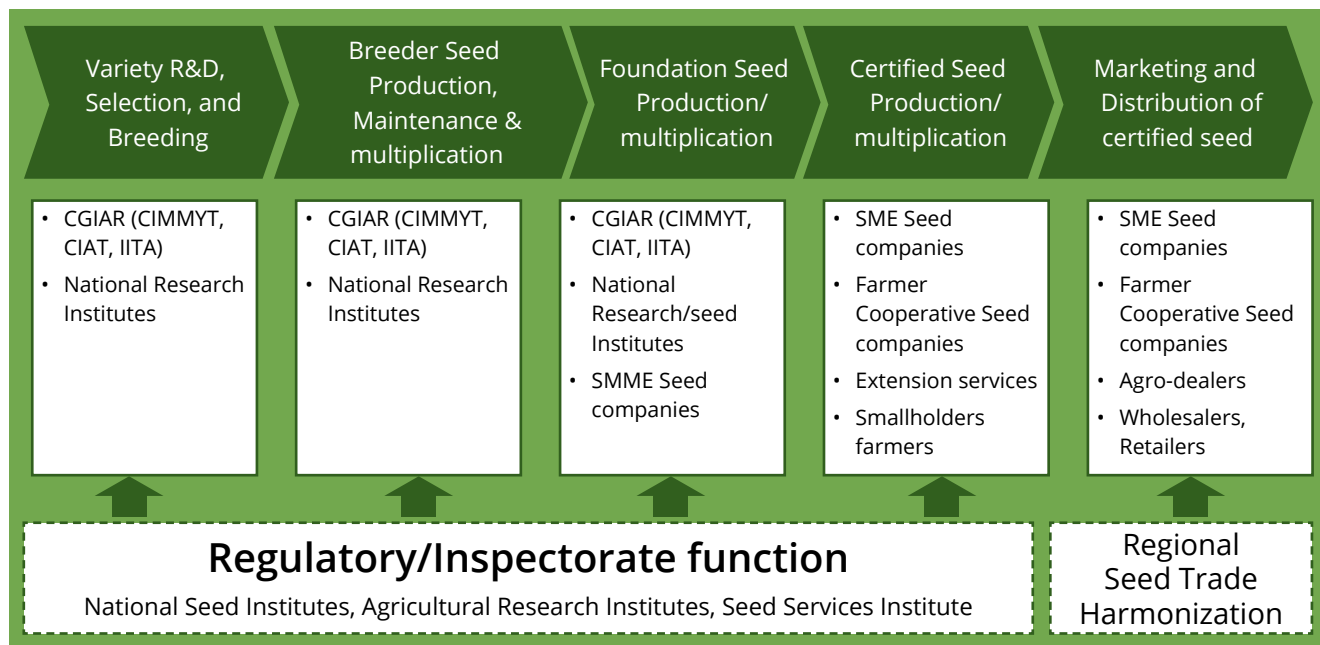


Figure 1: Stakeholders in resilience focused seed systems in ESA (adapted from Agri Experience. 2016).

## 1.2 Seed systems for climate resilience in ESA

The role of seed systems in climate change adaptation is founded on resilience focused plant breeding that is driven by genetic variation. Most crop species have adequate genetic variation that enables them to tolerate major climatic stresses such as drought, salinity, heat, and flooding.<sup>4</sup> However, much of this variation has been lost over time due to traditional plant breeding in highly managed environments that focused on narrow desirable traits such as yield only, resulting in crossing of elite-by-elite varieties. As the understanding of climate resilience has continued to improve, new breeding strategies are now being employed. For example, breeding for drier and hotter conditions now simultaneously focuses on a number of key physiological traits such as plant response to drought, deep rooting systems, smaller leaves, pod fill, grain yield, pollen viability, early flowering, delayed silking in maize, accumulation of molecular protectants, as well as water and nutrient use efficiency. Similarly, breeding techniques are now used to map and select genes for flooding or submergence tolerance using tolerant varieties in rice, wheat, and soyabean.<sup>5</sup>

### Key attributes of CSA-focused seed systems include:

- High yield
- Early maturity
- Water and nutrient use efficiency
- Heat tolerance, heat sheltering canopies
- Disease tolerance/resistance
- Fertilizer responsiveness
- Fodder qualities
- Soil improvement via root systems, nitrogen fixation
- Inclusive value chains, e.g. participation of smallholders in multiplication, agro-dealers in marketing
- Capacity development of farmers and other stakeholders

Box 2: Key attributes of CSA-focused seed systems.

4 Kamfwa, K, 2016

5 ibid

## 2 Typology of seed business models

### 2.1 Overview of typologies

This section outlines the broad typologies of seed business models adopted by the eight Vuna supported seed companies in ESA. Given the focus of this paper, the emphasis is on evolving, resilience focused systems that tend to be dominated by small and medium sized companies who have positioned themselves to deliver 'climate smart seed' within smallholder systems. Section 2.1 describes the broad typologies of the Vuna supported seed business models. Section 2.2 describes each of the typologies, including their key attributes, the role players, and the theories of change. This depiction provides a basis for subsequent discussions on the resilience building potential and sustainability of these business models.

Resilience focused seed business models that have received support from Vuna can be classified into the following two broad typologies: (i) Integrated models – with highly integrated and inclusive partnerships with key value chain actors such as smallholder farmers, EGS breeders, relevant government seed institutions, agro-dealers and retailers; and (ii) Informal/fragmented models – with informal, non-committal, inconsistent, and sometimes less transparent arrangements with farmers and other seed value chain actors. These two typologies are summarised in Table 1, highlighting their key attributes, the stakeholders involved, their roles and the nature of their relations with other value chain players. Examples of the Vuna funded seed businesses within each of these typologies are also given. Subsequent sections (3 and 4) further analyse each typology based on evidence from the Vuna supported business models to determine whether it is putting farmers and other market players on a path to resilience building and to determine its potential for sustainability.

**Table 2: Typologies of seed business models**

Attributes	Integrated model	Informal/fragmented model
<b>Type of anchor</b>	SME seed company	SME seed company
<b>Ownership structure</b>	Varying levels of farmer cooperative ownership and individual/private investor ownership	Individual/private investor ownership
<b>Type of management</b>	Professional management structure	Semi-professional management
<b>Nature of partnership with farmers</b>	Formal/binding contractual relations, binding buy back commitment	Informal/non-binding arrangements for cooperation, no binding buy back commitment
<b>Conditions for selling seed produced by farmers</b>	Farmer bound to sell exclusively to one seed company	Farmer encouraged to sell to partner seed company but there is no formal commitment, farmer can also sell to other buyers
<b>Source of foundation seed</b>	Foundation seed solely sourced and provided by seed company	Farmers get foundation seed from seed company or directly from producers of EGS
<b>Level of extension and other support services</b>	Strong support	Limited/no support, often dependent on independent efforts of third parties
<b>Quality of extension</b>	High quality extension	Variable - depends on third parties involved
<b>Cooperation with other value chain players e.g. agro-dealers, extension services, seed services, input suppliers</b>	Strong, consistent partnerships with multiple players	Limited, ad hoc, non-committal arrangements
<b>Potential for resilience building</b>	High potential	Limited
<b>Nature of costs and risk for the company</b>	Shared costs and risks	Low costs but high risks
<b>Vuna Innovation models in each typology</b>	ZSS (Zimbabwe), AfriSeed (Zambia), Kamano Seed (Zambia), Sociedade Beneficiamento Sementes (SBS) (Mozambique), Companhia de Zembe (Mozambique)	Future seed (Zambia), AfriSeed (Malawi), Mgom'mera Seed Company (Malawi), Seed for Food (Malawi)

## 2.2 Integrated models

### 2.2.1 Key attributes of the model

The integrated model has been adopted by the top tier of Vuna supported seed companies. Examples of seed companies that have adopted the integrated model include the ZSS (Zimbabwe), AfriSeed Pvt Ltd (Zambia), Kamano Seed (Zambia), Companhia de Zembe (Mozambique), and SBS (Mozambique). The most defining attribute of business models in this typology is that the seed company operates on the basis of strong, formal and inclusive, linkages with key value chain actors such as smallholder farmers, government extension services, agro-dealers and retailers. Typically, these seed companies have formal contracts with key partners such as farmers who multiply their seed and agro-dealers and retailers who sell their seed. Contracts with farmers for multiplication of seed typically express commitment to buy back seed from farmers, in addition to outlining the quantities of inputs to be supplied, estimated yield, price to be offered to the farmer, and expected quality standards (e.g. moisture content, germination, and purity). Foundation seed that is planted for multiplication by farmers is typically sourced and supplied by the seed company to guarantee its quality and varietal integrity. The OPVs of maize and self-pollinating small grains and legumes that are popular among Vuna supported seed businesses are sourced on open license<sup>6</sup> from CGIAR centers and agricultural research institutes. Some of the leading seed companies in this typology (e.g. ZSS and AfriSeed) pre-finance the foundation seed that they distribute to farmers, only deducting the cost at selling before farmers are paid.

The ZSS extension model is built on a partnership that includes ZSS district officers, government extension officers in each area, the Seed Services Institute (inspectorate), district and provincial farmer committees, and in some areas NGOs such as the Mwenezi Development Training Centre.

AfriSeed largely depends on the government entities such as Seed Control and Certification Institute (SCCI) to handle training and on-going farmer support as well as quality control. In other districts, farmers also receive extension support from NGOs.

**Box 3:** The ZSS and AfriSeed (Zambia) Extension Model



6 Open licence (as opposed to exclusive licence) allows the breeders of the variety (e.g. CGIAR) to sell the foundation seed for multiplication to more than one Seed Company. As such no one seed company has exclusive rights over the variety

Integrated models are founded on establishing long term mutually beneficial relations between the farmers and the company. As such, the Vuna supported seed businesses that adopted the integrated model work with the same groups of farmers from year to year, adding on new entrants as the business expands. The long term and stable nature of the relationship incentivises the seed company to invest in providing training and on-going extension support for the farmers. For all the Vuna supported seed businesses in this category, training and extension is an integral part of the partnership with farmers. The focus of extension support is on improving productivity and quality of seed. Since these seed companies are small to medium sized, their extension model typically leverages the support of other value chain players such as government extension services, seed inspectorate divisions, research entities, lead farmers, as well as NGOs (see Box 4). As such most of the farmers involved with these companies are now realizing good yields. With Vuna support, the training and extension thrust has also incorporated CSA technologies and practices as seed companies are seeking to stabilize seed production and increase yields under increasingly drier, hotter, and variable climatic conditions facing most farmers in ESA.

Sociedade Beneficiamento Sementes (SBS), a commercial seed processing company, is a joint venture between a private investor - Txopela Investments and a small commercial farmer (SCF) cooperative - COPAZA. The SBS's vision is to grow into a profitable supplier of certified seed and other agricultural inputs in Mozambique.

The SBS uses an integrated outgrower farming model with the COPAZA farmers producing basic seed for pigeon pea, sesame, soyabean, and butterbean with extension and mechanization equipment and training support from Technoserve (TNS). The seed produced is sold to SBS for cleaning, grading, storing, and packaging. At the SBS processing plant, TNS also provides management and technical support.

Once processed, SBS sells the improved seed to the COPAZA farmers to use for grain production. The COPAZA farmers also sell the seed to local smallholder farmers, lease mechanisation services and cascade extension training received from TNS to these farmers. Once grain is harvested, Txopela aggregates it and sells to value-adding processors for oil production.

In 2017, the SBS facility produced and pre-financed more than 300 metric tons of improved soyabean, pigeon pea, sesame, and common bean seed for more than 3,600 farmers.

**Box 4:** Sociedade Beneficiamento Sementes



“  
For all the Vuna supported seed businesses in this category, training and extension is an integral part of the partnership with farmers.”

### 2.2.2 Key model actors

Key actors within integrated business models typically include the seed company; the farmers; suppliers of EGS such as national and international research institutes; government seed inspectorates; government extension services; agro-dealers; and large retailers. A summary of the key actors and their roles within the integrated seed business model is outlined in Table 3.

**Table 3:** Key model actors and their roles

Actor	Role
The seed company	<ul style="list-style-type: none"> <li>• Sources foundation seed from breeders of EGS</li> <li>• Pre-finances seed for seed growers (farmers)</li> <li>• Coordinates and supports training and extension services to farmers in collaboration with government extension services, seed inspectorate</li> <li>• Buys, processes and packages seed from farmers</li> <li>• Coordinates marketing of certified seed in collaboration with agrodealers and retailers</li> </ul>
Seed growers (farmers)	<ul style="list-style-type: none"> <li>• Multiplies seed with support from seed company, government extension services, seed inspectorate</li> <li>• Harvest, clean, and deliver seed to processing centres</li> </ul>
Government agricultural extension services	<ul style="list-style-type: none"> <li>• Provides extension support to farmers in collaboration with seed company and seed inspectorate</li> </ul>
Government seed inspectorate services	<ul style="list-style-type: none"> <li>• Provides training to farmers in collaboration with the seed company and extension services</li> <li>• Monitors seed growers through inspections</li> <li>• Tests and certifies seed quality (germination, purity)</li> </ul>
Agro-dealers and retailers	<ul style="list-style-type: none"> <li>• Sells seed on behalf of the seed company</li> </ul>

### 2.2.3 Theory of change

Seed businesses that have adopted the integrated model seek to improve farmers' access to climate resilient seed while also building sustainable and inclusive value chains. By engaging smallholders as seed multipliers, and guaranteeing buy back of the seed, these seed companies are giving farmers opportunities to enter high value chains that significantly improve their income earning potential. High quality extension support is improving farmers' technical and managerial competencies, resulting in improved yields and quality of seed produced. The CSA training is also helping to stabilize yields regardless of climate variability. With improved yields, premium prices for seed, and a guaranteed market, farmers have higher and consistent income flows that enable them to invest in productivity enhancing inputs, as well as capital assets that strengthen and diversify their production systems. This results in improved adaptive capacity and reduces their sensitivity to climate and market related risks. Firms also benefit from higher and stable yields, improvements in quality, as well as trust building with farmers as this ensures them consistent access to seed for packaging and marketing.

### 2.2.4 Potential pathways to building resilient systems

#### **Farm-level**

The stable and broad-based nature of partnerships between seed companies in this typology and farmers within integrated business models brings a number of unique advantages. To start with, farmers are guaranteed of a market for their produce, in some cases at pre-agreed prices, although in most cases the agreement is based on market determined prices. Consistent market access and generally higher prices offered for seed (compared to commodity crops) are critical factors in boosting farmer incomes. In addition, farmers contracted by seed companies are now using their contracts as collateral to secure loans from financial institutions. These loans enable them to acquire adequate inputs and investments into capital assets that improve productivity and diversify production systems. Factors such as improved organizational capabilities, experience in managing commercial agreements, a demonstrated track record of dependability as well as good yields, are all positioning seed farmers for partnerships with a broad range of private sector players in various value chains. Complemented by the high quality extension and other farmer support services that have helped these farmers to improve yields and adopt highly commercial and yet climate smart production systems, integrated seed business models thus position farmers on a resilience building pathway.

### **Firm-level**

Seed companies that have adopted the integrated model, benefit from the support of other value chain players such as government extension services and seed inspectorate services. Although seed companies sometimes facilitate the operations of government partners to improve services to seed growers, they do not pay for such services. As such, they leverage the capacities of existing government services to support productivity and quality enhancing extension services for their seed growers. The resulting improvements in productivity and quality of seed and stability of supply due to reduced cases of side selling and the use of CSA practices all contribute to building a resilient seed business.

### **End-market level**

The incorporation of agro-dealers within integrated business models is resulting in vibrant local businesses that also bring services closer to farmers. Seed sales bring high and predictable incomes to agro-dealers with minimal additional costs. Many agro-dealers who sell seed among other products reported higher overall sales during the seed selling season due to increased traffic associated with seed sales. Vibrant agro-dealers are increasingly playing a major role in linking farmers to markets, including providing aggregation services for produce, resulting in reduced transaction costs for both farmers and off-takers.

### **2.2.5 Potential pathways to sustainability and scalability**

Prospects for sustainability are high for many of the seed business models that have adopted the integrated model. This is largely driven by stable commercial partnerships that provide certainty and incentives for key players such as farmers, the seed companies themselves, and agro-dealers. All the Vuna supported business models in this category are on course to developing into large seed companies in the coming years. Their rate of expansion, however, needs to be incremental rather than exponential to ensure internal capacity keeps up with the increasing scale. ZSS and AfriSeed, for example, have reported high rates of growth in the past year, which is putting pressure on their capacity to raise sufficient working capital and manage the increasingly more complicated logistical and operational needs. With the seed market remaining largely untapped, particularly among smallholder farmers in much of ESA, these businesses look set to develop into successful commercial ventures that will continue to prosper alongside farmers and other market players.





## 2.3 Informal/fragmented business model

### 2.3.1 Key attributes of the model

This typology of seed business models is characterized by informal, non-committal, and sometimes less transparent partnerships with farmers. Seed companies that have adopted this model are generally new entrants into the sector and are privately owned small businesses. Examples of Vuna supported seed companies that have adopted this business model include Mgommera Seed Investment (Malawi), Global Seeds (Malawi) Virelishame Investments (Malawi) and Future Seeds (Zambia) (see Box 5).

Although the seed companies involved depend on smallholder farmers to multiply seed, they generally do not enter into contractual or binding commitments for the production of seed. Rather they encourage independent seed producers and groups to multiply seed for them with the promise to buy the seed. While the intent to buy back seed is often genuine, this is not matched by available working capital for purchase of seed from farmers. Typically, these companies do not offer any training or extension support for farmers. They prefer to work with farmers of farmer groups who are already trained and accomplished as seed growers. As such there is little or no opportunity to establish long term relations or trust with farmers.

While in some cases the seed company provides foundation seed, farmers also acquire foundation seed independently from producers of EGS such as CGIAR centers or national agricultural research institutes in countries with liberal seed policies such as Zambia and Malawi. As such farmers in these relationships typically produce seed at their own risk, hoping to sell to the seed company or any other interested buyers within the seed market.

Seed companies in this typology have generally struggled to raise sufficient working capital to buy back seed from farmers. Their operations, therefore, remain small and informal with buy back rates below 15% of expected production. This has resulted in deteriorating relations with farmers who sometimes have no choice but to sell the seed as an ordinary commodity crop at far much lower price. Another weakness of this business model is a lack of solid and consistent marketing arrangements for certified seed. The seed companies typically do not have standing arrangements for distributing their seed for marketing. Arrangements with agro-dealers and other retailers are ad hoc and opportunistic. Sometimes the seed companies take advantage of inconsistent and unpredictable demand from NGOs or development programs that buy seed for farmers. As such the seed companies lack a viable strategy for ensuring seed sales and revenue generation.

African Women in Agribusiness (AWAB) is a Graca Machel Trust led network of female entrepreneurs in Malawi, Mozambique, Tanzania, Zambia, and Zimbabwe that “advocates for initiatives that enhance women’s competitiveness in local and global markets”. Under Vuna, AWAB in Malawi worked with women-owned seed companies to produce, process, and market climate smart certified seed.

The AWAB network was responsible for procuring and distributing breeder seed and coordinating seed companies. Along with three seed companies: Virelishama, Mgommera, and GlobalSeed, AWAB was also responsible for developing and distributing basic seed; overseeing seed multiplication of seed growers and overseeing selected agro-dealers. A further eight affiliate companies (Master Seed Company, Chizamsoka, Global Seeds, 7th Logistics Seed Company, Dzinja Services, Seed for Food, Zizwanthena Seed Company, Tipa) worked to oversee seed multiplication across the country.

AWAB has recently developed a business and implementation plan for a Franchise: Vuna. This franchise will brand certified seed and create a local agro-dealership network of seed distributors. Currently, 12 certified seed franchisees have signed up and 12 agro-dealer shops have been opened and branded. To be successful, AWAB recognises the need to partner with financial institutions to provide seed companies with loans that will allow the companies to buy-back seed from growers as well as to invest in extension services to the seed growers and the agro-dealerships to ensure consistency in the brand.



Figure 1: Vuna agro-dealer shop

#### Box 5: African Women in Agribusiness

### 2.3.2 Key model actors

Key model actors in informal seed business models include the seed company, seed growers, suppliers of EGS, and the seed inspectorate. Although government extension services and NGOs sometimes provide extension support to farmers, this support is opportunistic and unpredictable.

### 2.3.3 Theory of change

Although the expressed intent of these seed companies is to contribute building productive and successful farmers, their business model is not designed to achieve these objectives. Unless they transition into more formal and integrated businesses, their operations have little or no scope for driving change.

### 2.3.4 Potential pathways to building resilient systems

The potential contribution of business models in this category towards building resilience of farmers and other market players in the seed value chain is negligible, largely due to their failure to provide extension support or ensure a secure off-take market for seed. As a result, farmers have suffered losses after they have failed to sell their seed despite incurring significant production costs. Due to an absence of dedicated extension and other farmer support services, farmers have not benefited from potential yield and quality improvements.

Despondency among farmers resulting from the lack of capacity by seed companies in this typology has seen the emergence of farmer cooperative seed companies from producer groups that have struggled to sell their seed. In Zambia for example, well trained and experienced seed producer groups have found themselves without buyers for their seed after being let down by seed companies that fail to honour their buy back commitments. Examples of producer groups making this transition include Pache Pache and Kapiri Mposhi Seed Growers Associations in Zambia who are at an advanced stage of registering as seed companies. With the increase in the number of farmer groups that are involved in seed multiplication, it is likely that this category will continue to grow.

Typically, these farmer cooperatives are well organised and well trained in seed production. They are also well connected and knowledgeable about the workings of the seed value chain such that they can independently acquire foundation seed directly from suppliers of EGS, register as seed producers with the relevant regulatory authorities, request extension advice when necessary, and negotiate with potential seed buyers on the market. The Zambian context could be more conducive for the emergence of farmer cooperative seed companies, given opportunities for entering the agro-dealer based procurement system that is subsidised by government through its Farmer Inputs Support Program (FISP). The emergent farmer cooperatives are seeking to use this as their main market for seed particularly for legumes that are in short supply.

Locally, these seed producer cooperatives are already selling seed directly to other farmers in their communities, with certificates issued to farmers by the government seed inspectorate services as a guarantee of seed quality. Farmer cooperatives are also seeking to take advantage of partnerships with development agencies who have funds to support the necessary infrastructural developments such as warehouses and seed collection, cleaning and packaging plants. With lower operational costs and potentially lower need for working capital to purchase seed from farmers<sup>7</sup>, farmer cooperative seed business models may be able to overcome some of obstacles bedevilling small seed companies.

While it is premature to determine the resilience building contribution and sustainability of farmer cooperative seed businesses as many are relatively new, these could provide a viable alternative to privately owned seed companies using the informal business model. However, the poor reputation of farmer cooperatives when it comes to governance and financial management, as well as the complexity of marketing processes for seed, remains a major concern for their sustainability.-

### 2.3.5 Potential pathways to sustainability and scalability

Without a substantial shift in their business models and improvements in opportunities for raising working capital, the sustainability of seed companies in this typology is in doubt. Factors such as a poor reputation among farmers, the small-scale and opportunistic nature of their operations, and an overall negative perception within the industry all suggest that prospects for sustainability and scaling up for seed companies that have adopted the informal model are limited.

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<sup>7</sup> Members of the farmer cooperatives only expect to be paid when seed is sold so there is less mismatch between working capital needs and timing of revenue inflows

### 3 Assessing potential for success in seed business models

The emergence of small and medium sized seed businesses into the seed value chains following the liberalisation of the industry has opened opportunities for inclusive business models that embrace the participation of smallholder farmers and agro-dealers. Given the high prices of seed compared with commodity crops, this broader participation is directly contributing to higher incomes and opportunities for investing in productivity enhancing inputs and assets. Seed businesses that are founded on the integrated model are the most promising with respect to their own sustainability and potential to build resilience of farmers. Working capital challenges are at the centre of the poor performance of the informal/fragmented business model. Failure to secure financial resources to buy back seed from farmers is leading to a breakdown of the relationship with farmers and a generally poor reputation within the industry.

At the industry level, regional protocols for seed trade harmonization are potentially a game changer but their noble intentions are still to fully translate into benefits through a larger market for seed as well as a diverse source of EGS for multiplication. Cross-border seed movement still remains a protracted and risky undertaking for seed companies operating in ESA, particularly for smaller firms operating with tight working capital budgets.

#### 3.1 Emerging drivers of seed business model success

Factors that drive seed business model success in terms of building a sustainable and resilient market system are multifaceted and also dependent on the local context. Success of a business model is, however, closely related to the consistency, transparency, and fairness of partnerships with farmers; ability to leverage support of key stakeholders such as government agencies, particularly for delivering extension and other support; connectedness with channels for marketing seed, such as agro-dealer networks; targeting the crops with a growing demand (e.g. legumes, small grains); and lastly, a healthy relationship with financial partners to ensure adequate working capital. For these reasons, seed business models that have adopted the integrated model have been more successful in guaranteeing quality of seed, consistent supply and sufficient commercial incentives for farmers. The key drivers of success are discussed in detail below.



### 3.1.1 Context related factors:

**Liberal policy environment:** The growth of small to medium sized seed businesses is being driven by a combination of factors. Among these is a liberal seed sector policy regime that has relaxed a number of restrictions within the seed sector, making it easy and cheaper for new entrants to operate. Examples of such a liberal policy environment in countries such as Malawi, Mozambique, and Zambia allow farmer groups to independently register as seed growers and acquire foundation seed directly from producers of EGS. More liberal controls on such processes as is the case in Zambia and Malawi provide space for the growth and sustainability of small seed businesses.

**Experienced seed producer groups:** A growing community of well trained and experienced seed producer groups coupled with appropriate support from government extension system and seed inspectorate services have aided the emergence of informal seed business models. Their sustainability and resilience building contribution to members will, however, depend on downstream and upstream integration with key value chain actors, good governance, transparency, and prudent financial management.

**Regional trade protocols:** Although the benefits of regional seed trade harmonization are still to fully materialize, there is great potential to drive intra-regional trade and broaden the market base for seed companies, particularly for dominated crops such as small grains and legumes.

### 3.1.2 Design related factors

**Strong commercial incentives:** High seed prices and guaranteed off-take market are key drivers of success for seed companies as they provide the necessary incentives to farmers. Cases of side-selling are eliminated where companies have contract farming arrangements as the strict seed custody chain and premium prices above those paid for commodity crops discourage third party sells.



**Partnerships with key actors:** Vuna supported seed companies with limited working capital budgets have managed to leverage the support of other value chain players such as government extension services and seed inspectorate services to lower their costs of providing farmer support services. This has enabled these seed companies to improve productivity and quality of seed without a significant financial burden that threatens their viability.

**High quality extension support:** High quality extension support has resulted in significant yield and quality improvements and associated income benefits to both farmers and the seed companies, providing incentives for sustained cooperation.

**Strong marketing network:** Partnerships with agro-dealers have brought a competitive edge to many of the companies who face significant competition from large, well established seed companies. This approach has helped small to medium sized companies to broaden their marketing network, bringing their seed close to farmers at lower cost.

**Niche crops:** Many of the small to medium sized seed companies supported by Vuna are focusing on 'niche' crops such as self-pollinating OPV maize varieties, small grains, and legumes that are typically less onerous to grow and thus suitable for smallholder conditions. These crops are also seen as less profitable for large seed companies and thus small companies minimise direct competition.

**Adaptable seed varieties:** The focus on climate resilient seed varieties is giving Vuna supported seed businesses an edge over established seed companies. Increasingly hotter, drier, and variable climatic conditions across ESA are encouraging a focus on more adaptable seed varieties that have not been the focus of well-established seed companies.

### 3.1.3 Implementation related factors

**Trust building with farmers:** Investing in trust building between farmers and the seed company is a key driver of success. Companies that provide dependable and consistent farmer support services have benefited from the resultant trust building, translating to reduced risks associated with side-selling and contamination of seed.



“ Investing in trust building between farmers and the seed company is a key driver of success. ”

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