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Acronyms

ADMARC	Agricultural Development and Marketing Corporation
AGRA	Alliance for Green Revolution in Africa
AFAP	African Fertiliser and Agribusiness Partnership
ASF	Area-specific fertiliser
ASWAP	Agricultural Sector Wide Approach
AU	African Union
BMGF	Bill & Melinda Gates Foundation
CAADP	Comprehensive Africa Agriculture Development Programme
CGIAR	Consultative Group on International Agricultural Research
CIAT	International Center for Tropical Agriculture
CIMMYT	International Maize and Wheat Improvement Center
COMESA	Common Market for Eastern and Southern Africa
DAPR	Department of Agricultural Planning and Resources
DARS	Department of Agricultural Research Services
DLRC	The Department of Land Resource Conservation
EGS	Early Generation Seed
FAO	Food and Agriculture Organization of the United Nations
FISP	Farm Input Subsidy Programme
FUM	Farmers' Union of Malawi
GAP	Good agricultural practice
GDP	Gross Domestic Product
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFAD	International Fund for Agricultural Development
IEC	Information, education and communication
IITA	International Institute of Tropical Agriculture
ISFM	Integrated soil fertility management
KIIs	Key informant interviews
KIT	Royal Tropical Institute
LUANAR	Lilongwe University of Agriculture and Natural Resources
MBS	Malawi Bureau of Standards
MFC	Malawi Fertilizer Company
MFRS	Malawi Fertilizer Regulatory Service
MOAIWD	Ministry of Agriculture, Irrigation and Water Development
MUSECO	Multi Seeds Company Limited
NAP	National Agricultural Policy
NASFAM	National Smallholder Farmers Association of Malawi
NGO	Non-governmental organisation
NORAD	Norwegian Agency for Development Cooperation
OPV	Open-pollinated variety
PIATA	Partnership for Inclusive Agricultural Transformation in Africa
RUMARK	Rural Market Development Trust
SADC	Southern Africa Development Corporation
SAPP	Sustainable Agriculture Production Programme
SSFRFM	Smallholder Farmers Fertilizer Revolving Fund of Malawi
SMEs	Small and medium-sized enterprises
SSTP	Scaling Seed and Technologies Partnership in Africa



SSU	Seed Services Unit
STAM	Seed Traders Association of Malawi
SWET	The Story Workshop Educational Trust
USAID	United States Agency for International Development

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1 Summary of results

1.1 Introduction

The Alliance for Green Revolution in Africa (AGRA) aims to catalyse and sustain an inclusive agricultural transformation in Africa by increasing incomes and improving food security for 30 million farming households in 11 focus countries. Since 2006, AGRA and its partners have worked across Africa to deliver proven solutions to smallholder farmers and thousands of African agricultural enterprises. The alliance has built the systems and tools for Africa's agriculture: high quality seeds, better soil health, and access to markets and credit, coupled with stronger farmer organisations and agriculture policies.

AGRA's theory of change is that sustainable agricultural transformation can be facilitated through a combination of:

- Policy and state capability – investments to work with and support governments to strengthen execution and coordination capacities, enhance transparency, accountability and enabling policy environment;
- Systems development – investments to build downstream delivery systems while providing support to local private sector to scale technologies and services for better productivity and incomes; and
- Partnerships – to facilitate alignment between government and private sector, improving integration and coordination for investments in agriculture.

In Malawi, AGRA's current primary objective is to increase incomes, improve food security and reduce shocks and stresses for smallholder households in five value chains – namely groundnuts, maize, pigeon peas, rice and soybean. AGRA does not pursue direct farmer-level interactions but instead focuses on two primary outcomes at the system level: (1) strengthened agricultural input systems and technology, and supply chain development; and (2) increased adoption of agricultural productivity-enhancing technologies through support to the extension system. The four strategic objectives formulated by AGRA that are currently ongoing are in line with these outcomes. The planned strategic objectives aim to strengthen and expand access to output markets, which will be the next primary focus of AGRA Malawi, and are as follows.

- Strategic objective 1: Seeds system (ongoing)
- Strategic objective 2: Fertiliser/soil system (ongoing)
- Strategic objective 3: Extension system (ongoing, but minor focus)
- Strategic objective 4: Input distribution system/agro-dealers (ongoing)
- Strategic objective 5: Market system (in planning)
- Strategic objective 6: Inclusive finance (in planning)

AGRA Malawi has aligned its work on national policy implementation and the formation of strategic partnerships with its objectives to improve input supply systems, increase demand and guide use. Key ongoing projects focus on:

- Improved production and supply of early generation seed (EGS) and certified seed. Projects cover the entire supply chain, from EGS production to availability and affordability at agro-dealers;

- Improved quality, effectivity and availability of fertiliser. Again, projects cover the entire supply chain, from formulae development to availability and affordability at agro-dealers;
- Capacity building aiming to disseminate knowledge on value and best practices of fertiliser inputs and certified seeds;
- Strengthening government state capability and support policy implementation where this enables a better business environment for agriculture and agricultural inputs in Malawi.

The current strategy runs from the fourth quarter of 2017 until the end of 2021 and provides for a total investment of over US\$1,800,000. The strategy is aligned with the government's priorities and contributes to the need for a strong sector with effective coordination and implementation capabilities

It is clear that at this stage of implementation of the AGRA's 2017-2021 strategy, the focus of AGRA Malawi lies heavily on improving the input supply sectors, by funding projects aimed at systems development and building policy and state capability. This study, commissioned to document AGRA's activities in Malawi and analyse to what extent AGRA influences system level changes in Malawi, investigates the two most relevant systems – the seed system and the fertiliser system. Data was collected through key informant interviews (KIIs), two stakeholder workshops (for the systems' review), and a survey for small and medium-sized enterprises (SME performance report). Data collection mostly took place in Lilongwe and Blantyre in November 2019.

1.2 System analysis

Seed system

System change needs

Compared to other countries in sub-Saharan Africa, Malawi's seed sector is characterised by a large number of international and national seed companies actively engaged in seed production and marketing. Seed multiplication takes place through an established network of out-grower farmers, mostly medium or larger-sized. The seed system is also characterised by a strong focus on providing certified seed of maize and, to a lesser extent, legumes. These seeds reach the market largely through the Farm Input Subsidy Programme (FISP), which captures the largest proportion of the government's agricultural budget. Purchasing certified seeds on commercial terms, however, is beyond the reach of most smallholder farmers. This explains why a large amount of seed is accessed through the informal seed system. While there are many small agro-dealers in the country, high default rates have led to widespread mistrust and impaired a functional input distribution system. Quality assurance is also a general problem in the seed sector due to the inadequate capacities of the quality control authority, the Seed Services Unit (SSU).

AGRA objectives and activities

After the Scaling Seed and Technologies Partnership in Africa (SSTP) programme came to an end in 2018, AGRA analysed the remaining gaps in the seed system and identified a number of key priorities:

- Increase EGS production to supply the market;

- Improve seed companies' business models and integration in a larger network of market actors;
- Support clear and enforceable policy and a regulatory environment.

Committed investments just exceed US\$1 million at this stage. Two projects are funded through the International Fund for Agricultural Development (IFAD) and three receive funding through the Bill & Melinda Gates Foundation (BMGF). Activities include:

- EGS production support for legumes and maize to deliver high-quality foundation seed to seed companies, individual seed growers and non-governmental organisations (NGOs);
- One grantee, a private seed company, is also tasked with certified seed production of legumes through community-based production schemes;
- AGRA supports the improved distribution of seed (and other inputs) by linking (legume) seed suppliers to selected agro-dealers, training agro-dealers and supporting larger hub agro-dealers to supply smaller agro-dealers with quality inputs;
- On a policy level, AGRA has extended two grants to build momentum for the enactment of the Seed Bill.

Early results and analysis

With regard to EGS production, AGRA's current investments clearly promote private sector engagement, which reduces the pressure on public EGS providers. However, it should also be noted that increased availability of EGS is only of interest to national seed companies, but not international ones – which are, by far, the main players in the seed sector. This suggests a limited market for EGS in Malawi. Both grantees that AGRA supports for EGS production have recently ventured into certified seed production because of limited off-takers for EGS.

Furthermore, AGRA supports the development of hub agro-dealers. The hub-and-retail model promoted by AGRA is promising to re-establish the importance of agro-dealers and increase the availability of quality inputs for smallholder farmers.

Finally, AGRA's support to enact the Seed Bill is expected to significantly improve the legislative framework. The Bill will address issues such as seed certification, penalties, variety release and regional harmonisation.

While AGRA's activities are commendable, it was also observed that AGRA can increase relevance and effects by paying to attention to (i) the uptake of improved seed, (ii) improving the sustainability of the formal seed sector beyond FISP support, and (iii) improving the informal seed sector.

Fertiliser system

System change needs

The low utilisation rate of inorganic fertiliser is an important determinant of Malawi's low agricultural productivity. Moreover, due to high soil depletion rates and rapid acidification, current fertiliser application rates lead to increasing nutritional deficits, even further pressurising agricultural productivity and economic output in the (near) future. According to AGRA's own studies, fertiliser application rates are to double if agricultural growth targets are to be met. Causes of inefficient fertiliser application rates are:

- Fertiliser availability: AGRA is targeting fertiliser availability by supporting the development of a strong and capable network of agro-dealers throughout Malawi.

The fertiliser supply chain is currently characterised by high levels of mistrust between actors and low financing capabilities by retailers. Due to high default rates, fertiliser companies are unwilling to supply agro-dealers to produce on credit, making fertiliser hard to acquire in the more rural areas. AGRA aims to restore trust in the system by supporting the development of the hub- retail model and the training of agro-dealers on business practices;

- Fertiliser quality: Currently, only one blend of fertiliser is allowed to be sold off-the-shelf, the so-called blanket fertiliser, which fails to address the nutritional needs of different soil types in Malawi. This causes inefficiencies in the short term, and damages soil quality in the long term. Besides, the available blanket fertiliser that is retailed to farmers is too often of poor quality, as lacking quality checks allow fake and spoilt fertiliser to make its way down the supply chain.
- Fertiliser demand: There is insufficient demand from smallholder farmers, as they are unaware of the productivity-enhancing qualities of inorganic fertiliser, uninformed of their appropriate application rates and methods, cautious of quality risks, and are often lacking financing capacity.

AGRA objectives and activities

AGRA aims to improve the fertiliser system by targeting quality, availability and efficiency of fertiliser. The change ambition is three-fold, as outlined in their operational plan:

1. Support to develop “fertiliser blending and formulations tailored to specific soils and locations for Malawi” (AGRA Malawi, 2019e);
2. Enhance state capacity and policy, specifically by supporting the development of a fertiliser policy and act;
3. Strengthen the agro-dealer network in order to bring both fertilisers and extension services close to the farmer.

Early results and analysis

AGRA has various activities in place to reach those priority objectives. Table 12 provides a comprehensive overview linking each intervention to its key objective. Various interventions of AGRA were in a sufficiently progressed state of execution to reflect upon. Key interventions in the seed system are:

- Fertiliser Bill: AGRA supports the development of a national fertiliser policy and bill. The bill provides for strong regulatory institutions with the ability to regulate and inspect fertiliser quality throughout the supply chain. Currently, prevalence of spoilt and counterfeited fertiliser is high (yet unquantified), resulting in mistrust throughout the supply chain and suspicion among farmers;
- Area-specific fertiliser: AGRA aims to enhance the efficiency of use by supporting the development of area-specific fertilisers. AGRA has financed the testing and mapping of soil types and currently, area-specific fertilisers are being tested and developed. Whilst there is no doubt that farmers have a lot to gain by applying fertiliser that is better suited to their soil, it is not convincing that AGRA pays sufficient attention to the potential market distortions resulting from this change;
- Agro-dealers hub: AGRA aims to restore trust in the system after episodes of agro-dealer defaults by supporting the development of the hub-retail model and the training of agro-dealers in business practices.

1.3 SME performance

In Malawi, 30 SMEs participated in the survey. The sample was composed of 30 input supply or agro-dealers, of which, 15 also acted as aggregators. SMEs belonging to the categories of commercial seed producers, seed or input companies did not participate in the interviews, and thus, are not represented in the sample.

In the agro-dealer category, the SMEs showed poor performance in terms of business resilience and technology. The business resilience performances were low due to the fact that these SMEs are new enterprises, having only been in business for three years on average. They offer only two services on average, mainly the retail of improved or certified seeds and chemical fertilisers; and they deal with two buyers on average, individual buyers and traders.

These SMEs made few technology investments (i.e. investment in research and development (R&D), in buildings or storage facilities, and/or in equipment) in the last three years. None of the SMEs invested in R&D. However, whilst the business resilience and technology performances are quite poor, the agro-dealers show a positive pathway toward financial stability. For instance, they showed an average financial stability score of 2.6, indicating that the SMEs are close to good performances. On the hand, in terms of human capital, these SMEs should enrol more female and skilled employees.

Regarding the aggregators' category, similar pathways were registered. In particular, the business resilience score was low, signalling poor performances in this area. The low value is due to the fact that these SMEs are new enterprises, having been in business for three years on average. They offer around one service on average, mainly the aggregation of farmers' production. The enterprises deal with two buyers on average, mainly individual producers and traders. These SMEs did not make any business investments in the last three years. The financial stability of the aggregator shows a positive pathway toward good performances, but in terms of human capital, it might be a good strategy to enrol more female and skilled employees.

2 Objectives and scope

The Royal Tropical Institute (KIT) was contracted by AGRA to conduct the annual outcome monitoring of its activities under the 2017-2022 Partnership for Inclusive Agricultural Transformation in Africa (PIATA).

In this context, annual outcome monitoring has three different, interrelated objectives:

1. Understand AGRA's progress towards desired outcomes, both for internal and external reporting;
 - a. Elicit data and insight into the effect of AGRA interventions on its beneficiaries
 - b. Provide insight into sustainable improvement of the performance of agricultural sector support systems
2. Learn about the performance of AGRA interventions, to allow for intelligent evidence-based adaptation of implementation;
3. Document lessons learned for improved design of future AGRA – and external – interventions.

These objectives were realised through a combination of qualitative and quantitative methods, implemented by a team of international and local experts. The Malawi team consisted of:

- Two international experts in qualitative data collection in agriculture;
- A national expert in qualitative data collection in agriculture;
- A number of desk-based international analysts on quantitative (SME) data.

AGRA Malawi selected the seed and fertiliser systems as priority domains for the system analysis. Primary data was collected by the qualitative team in Lilongwe and Blantyre, Malawi, over a period of two weeks in November 2019. For each system, information was collected via KIIs. The key informants were identified by AGRA, and a small number were 'snowball' referrals (i.e., suggested by other interviewees). The consultants also organised two stakeholder workshops in Lilongwe on the seed and fertiliser systems at the AGRA Malawi office.

SME surveys were administered to 30 selected companies and business linked to AGRA interventions: 15 aggregators and 30 input supply agro-dealers, where some of the SMEs performed both roles.

AGRA Malawi made available country programme roadmaps and information related to issued and planned grants. Secondary data and online reports completed the data sources.

This report should be read whilst keeping in mind the limitations of the study. The system analysis was limited to two systems, and field data collection was limited to one week per system. Also, the SME performance survey was designed for rapid and cost-effective data collection.

PART I: Qualitative system analysis

3 Introduction system analysis

3.1 Agricultural policy context

Agriculture is the backbone of the Malawian economy – it contributes around 30% of Gross Domestic Product (GDP), and accounts for 80% of total exports and 65% of total employment in the country (World Bank, 2018). Agriculture also contributes significantly to national and household food security and nearly 90% of poor households are engaged in some kind of agricultural activity (World Bank, 2018). Agriculture's importance is such that the country remains among the world's 15 economies most dependent on agriculture (World Bank, 2018).

Agriculture in Malawi features two major subsectors – the smallholder and estate subsectors. During the 2016 season, smallholders covered 98% of production whereas estates occupied the remaining 2% (USAID, 2019). At the same time, the estate sector contributes about 90% of total export value (USAID, 2019).

Smallholder farmers engage mostly in food crop production, such as cassava, Irish potatoes, maize and rice, but they are also the largest suppliers of tobacco – the country's greatest single export product. Maize is by the far the most dominant crop, occupying an estimated 60-80% of the land cultivated by smallholders (USAID, 2019), and contributing 25% of total agricultural GDP (White, 2019). The reliance on maize-focused production is also reflected in the crop's importance for consumption; per capita, maize consumption is the second highest worldwide (World Bank, 2018) – much of which (around 65%) comes from own production for self-sufficiency (World Bank, 2018).

Commercial estates are export-oriented, growing coffee, macadamia nuts, sugar cane and tea. The estate subsector also provides contract farming opportunities for smallholders, specifically for tobacco and sugarcane, but increasingly also in horticulture (MOAIWD, 2016).

The agricultural productivity of smallholder farms remains relatively low, due to soil fertility losses from land degradation, heavy dependence on rain-fed agriculture and agro-ecological pressures. In the 2017/18 agriculture season, an estimated 20% of Malawi's total crop loss was due to pests, particularly fall armyworm (World Bank, 2018). Small farm sizes, poor infrastructure, limited storage facilities, high post-harvest losses, weak linkages to markets, low prices and limited agro-processing are further challenges confronting the agriculture sector.

In view of the challenges of the agriculture sector in Malawi, the country has been overhauling and developing new agriculture sector policies in the past few years, with significant backing by development partners through the Agriculture Sector Wide Approach (ASWAP) support project (World Bank, 2017).

The main policy document guiding agricultural transformation is the National Agricultural Policy (NAP) of 2016, which was launched as the country's first Malawi-born agriculture policy. It was developed in wide-ranging consultation with stakeholders, including farmers, NGOs, development partners, research and government staff (MOAIWD, 2016). The thrust of this policy is to achieve farmer-led agricultural transformation and commercialisation that

entails treating farming as a business, and shifting from subsistence farming to non-traditional, high-value agricultural value chains. The NAP identifies a set of priority actions necessary for realising this envisaged agricultural transformation as follows: sustainable agricultural production and productivity; sustainable irrigation development; mechanisation of agriculture; agricultural market development, agro-processing and value addition (MOAIWD, 2016).

Similar objectives can be found in the Malawi Growth and Development Strategy III (2017/18-2022/23) and the National Agricultural Investment Plan (2017-2021). Thus, agriculture is high on the political agenda in Malawi. And while significant donor pressure can be identified as one of the reasons for this, the prominent position of maize for Malawian economic, social and personal wellbeing is perhaps the key determining factor for the sector's increased attention (White, 2019). As Mdee and Ofori Dedaa (2018) remark, "the legitimacy of a government in Malawi greatly depends on whether it can provide maize to the people". Also, the 2018 National Agricultural Investment Plan recognises that "maize has been at the centre of agricultural policies and public expenditures for decades", rendering the country vulnerable to production and market risks and continued food insecurity (MOAIWD, 2018).

Notwithstanding the pronounced focus on maize, Malawi's progress on agricultural transformation is rated positively against the country's Comprehensive Africa Agriculture Development Programme (CAADP) commitments. For the 2017 biannual review, Malawi achieved an overall score of 4.9, indicating that it is on track to meet the CAADP commitments (see Table 1). Malawi achieved an above-minimum score and is on track in four thematic areas: the recommitment to the CAADP process; enhancing agricultural finance; boosting intra-Africa trade in agricultural commodities; and commitment to mutual accountability for action and results (AU, 2018).

Also noteworthy is Malawi's high spending on agriculture. In the period of 2008-2014, the country's public expenditure on agriculture averaged 18.9% of total public spending – the highest level among southern African countries (ReSAKSS, 2019). Recently, however, public spending has fallen and just met the 10% benchmark in 2018/19 (JICA, 2019).

Table 1: Malawi's progress towards implementing the Malabo Declaration on agricultural transformation in Africa (2018)

Five key areas of strong performance		Five key areas of weak performance	
CAADP process completion	100%	Increase of agricultural value added per agricultural worker	-5.2%
Quality of multi-sectorial and multi-stakeholder coordination	42%	Annual growth of the agriculture value added (agricultural GDP)	-2.3%
Public agriculture expenditure as a share of total public expenditure	17.6%	Response to spending needs on resilience building incentives, from the government budget	67%
Youth engaged in new job opportunities in agriculture value chains	29.7%	Increase of agricultural value added per arable land	-5.5%

Agricultural commodity value chains for which a public-private-partnership is established with strong linkage to smallholder agriculture 5 Increase of the value of intra-African trade of agricultural commodities and services -14.9%

Country progress score (out of 10): 4.9 (on track)

Source: AU, 2018

Especially since the early 2000s, donors have shown growing interest in Malawi's agriculture, targeted at encouraging foreign investments, improving market access for smallholder farmers and diversifying agricultural production. AGRA is among the organisations working on agriculture in Malawi, focusing specifically on issues of agricultural transformation.

3.2 AGRA objectives and activities

AGRA Malawi focus and activities, 2006-2016

AGRA has been active in Malawi since 2006, providing different forms of financial and technical support. All major continental AGRA programmes have been implemented in Malawi, including the Soil Health Programme, the Programme for Africa's Seed Systems, including the (Malawi) Agro-Dealer Strengthening Programme, and the SSTP.

Over the years, AGRA indicates to have spent more than US\$20.6 million in Malawi in the form of grants towards capacity building, R&D, input production and distribution, agriculture transformation awareness, technology adoption and production, and post-harvest handling (AGRA, 2019a). Achievements from 2006-2016 (AGRA, 2019b) are summarised in Figure 1 below.

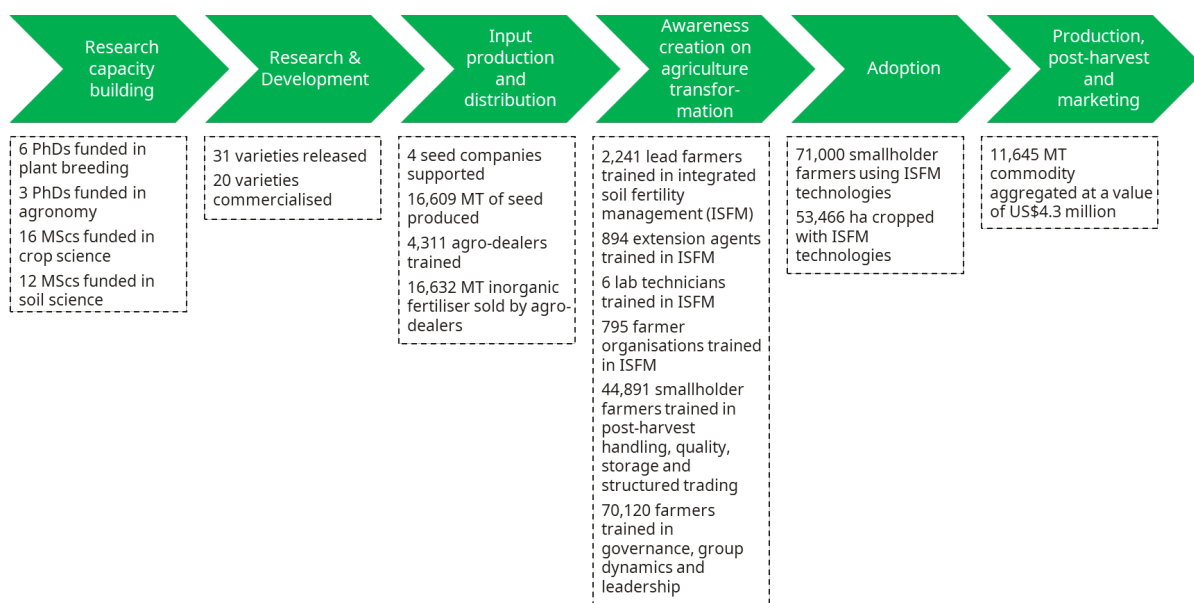


Figure 1: AGRA investments and results in Malawi, 2006-2016

AGRA country strategy 2017-2021

In the current framework of activities (2017-2021), AGRA's objectives in Malawi are to increase incomes, and improve food security and reduce shocks and stresses for smallholder households in five value chains – namely groundnuts, maize, pigeon peas, rice,

and soybean. AGRA Malawi does not pursue direct farmer numbers but focuses on national policy implementation under the policy and state capability strengthening body of work, systems' strengthening and building strategic partnerships. The systems' strengthening interventions focus on the following different objectives, either ongoing or planned, for the future:

- Strategic objective 1: Seeds system (ongoing)
- Strategic objective 2: Fertiliser/soil system (ongoing)
- Strategic objective 3: Extension system (ongoing, but minor focus)
- Strategic objective 4: Input distribution system/agro-dealers (ongoing)
- Strategic objective 5: Market system (in planning)
- Strategic objective 6: Inclusive finance (in planning)

AGRA's 2017-2021 investments of are set to amount to over US\$1,808,000 (AGRA, 2019a). At the time of this study, AGRA had nine ongoing grants spread out over six objectives (Table 2).

Table 2: Overview of current AGRA investments

Project	Area	Grantee	Amount	Start – end
Strengthening Seed and Other Farm Inputs Distribution Systems for Improved Food Security and Incomes of Smallholder Farmers in Malawi	Agro-dealer development (seed and fertiliser)	Rural Market Development Trust (RUMARK)	US\$135,207	August 2018 – February 2020
Production and Delivery of Early Generation and Certified Seed for Improved Livelihoods of Smallholders in farming communities supported by IFAD under the Sustainable Agriculture Production Programme (SAPP) project in Malawi	Seed system	Multi Seeds Company Limited (MUSECO)	US\$128,489	June 2018 – August 2020
		DARS	US\$77,400	June 2018 – May 2020
Creating an enabling policy environment for agricultural businesses in Malawi	Policy (seed, fertiliser, extension)	Department of Agriculture Planning Services	US\$240,998	October 2018 – September 2020
Policy Reform Advocacy for Malawi's Agriculture Input Systems	Policy (seed, fertiliser, extension)	Farmers Union of Malawi	US\$235,369	September 2018 – May 2020
Drought-Tolerant Maize and Groundnut Rosette Resistant Foundation Seed Up-Scaling Project	Seed system	Global Seeds	US\$221,200	November 2018 – May 2021
Strengthening Fertiliser Systems Through Promotion of Area-Specific Fertiliser (ASF) Blending in Malawi	Fertiliser system	Department of Land Resources	US\$335,041	December 2018 – November 2020
		African Fertiliser and Agribusiness Partnership (AFAP)	US\$185,254	
		Story Workshop Educational Trust	US\$129,223	

At this stage of AGRA's 2017-2021 strategy implementation, the focus of AGRA Malawi lies heavily on improving the seed and fertiliser sectors by funding projects aimed at systems development, and building policy and state capability.

4 Seed system

4.1 System performance

Like most other African countries, the seed industry in Malawi consists of two broad sub-systems – the informal sector (farmer-saved seeds and community-based seed production), and the formal sector (public research, private seed companies and NGOs). The farmer-saved seed system, where farmers multiply and exchange seed based on traditional and informal practices, accounts for the majority of seed volume, while private sector companies contribute the majority of EGS and certified seed (USAID, 2019). The following analysis focuses mostly on the formal seed sector.

Variety development

Plant breeding and variety development in Malawi are mainly carried out at three levels: (i) by public research, especially the Department of Agricultural Research Services (DARS), and universities, e.g. Lilongwe University of Agriculture and Natural Resources; (ii) by international Consultative Group on International Agricultural Research (CGIAR) centres, in collaboration with DARS; and (iii) by the private sector, particularly international seed companies (Phiri & Phiri, 2017). The DARS is the main source of variety development, together with CGIAR centres. All varieties released through public research is public material and is made available to private companies for multiplication or as input for their own breeding programmes.

Almost all national seed companies rely on such publicly available varieties for seed multiplication and distribution, as they do not have their own breeding and varietal development capacity (Phiri & Phiri, 2017). International seed companies, on the other hand, do engage in variety development (for the Malawian market mostly for maize) – but at research stations outside of Malawi (Mabaya et al., 2017). This is because foreign companies do not have the right to own land in Malawi (Phiri & Phiri, 2017) and plant breeders' rights are not protected (World Bank, 2019), which discourages investments into variety development in the country.

Most varieties released in Malawi are for maize given its strategic position as the major food crop in Malawi and its prominence in government subsidies (USAID, 2019). It is also due to the fact that out of the eight active breeders in Malawi (seven of which carry out public research under DARS), four work on maize, three on beans, and two each on groundnuts and soybeans (Mabaya et al., 2017). According to the African Seed Access Index, between 2014 and 2016, 17 new varieties of maize were released, compared to zero varieties for beans, groundnut and soybeans. This reflects the limited investment in R&D for new crop varieties other than for maize (Mabaya et al., 2017).

All new varieties brought into the countries need to undergo performance trials for three seasons before being able to be officially approved by the Agricultural Technology Clearance Committee under the Ministry of Agriculture, Irrigation and Water Development (MOAIWD). The average release time of new seed varieties is 34 months according to the African Seed Access Index (Mabaya et al., 2017), but less than 20 months according to MOAIWD (2018) and the World Bank (2019).

While overall, reports indicate that Malawi has a well-structured breeding system (USAID, 2019), some challenges remain. This is attributed, first and foremost, to the weak capacity of public research as a result of underfunding. Between 2000 and 2013, agricultural research only received about 4% of the agricultural budget, manifesting, for example, in few active breeders in the country and inadequate germplasm material (Phiri & Phiri, 2017). There are also delays associated with the Agricultural Technology Clearance Committee, which lacks the funding to meet regularly and approve, release and publish new varieties.

EGS production

Both the public and private sectors are responsible for producing seed for the varieties they wish to commercialise (Audet-Belanger et al., 2016). Both produce open-pollinated varieties (OPVs) and hybrids, but particularly with maize, there is a clear trend towards hybrids, as seed companies are increasingly reluctant to engage with OPVs. All EGS is required to undergo inspection by the SSU of DARS for quality control.

For local seed companies, most of which do not engage in EGS production themselves, the main sources of EGS are DARS and the CGIAR centres (the International Maize and Wheat Improvement Center (CIMMYT) for maize, and the International Institute of Tropical Agriculture (IITA), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and the International Center for Tropical Agriculture (CIAT) for legumes). However, the public breeding system has limited capacity, leading to a general shortage of EGS from these sources as well as compromised quality and untimely supply (Audet-Belanger et al., 2016). Therefore, interviews suggest that at least the medium and larger-sized seed companies are increasingly engaging in foundation seed production (note, not breeder seed), or sourcing their starter material from outside the country. Two smaller national seed companies have even specialised in breeder and foundation seed production – MUSECO (especially beans, soybeans and groundnuts) and Global Seeds (groundnuts and maize) – mostly through out-grower schemes.

EGS production is already an established practice of international seed companies, which use their own EGS sourced from research facilities outside Malawi (Mabaya et al., 2017). These companies refer to the lack of plant breeders' rights as disincentive to invest in EGS production in Malawi. At the same time, these companies occupy an estimated 70% of the seed market, which implies that the demand for EGS is entirely driven by – and limited to – national seed companies. While recent reports indicate that demand for EGS exceeds supply (USAID, 2019), interviews with the two EGS-producing seed companies paint a more complex picture. Because EGS production by public research is constrained by a lack of resources and insufficient infrastructure (including lack of irrigation capacity, mechanisation, and cold storage for germplasm), donor projects regularly fund CGIAR EGS production. This is then sold on the market but leads to unfair competition (see also Mukelano, 2016; Phiri & Phiri, 2017). In general, there is no good overview of EGS production demand in Malawi (Mukelano, 2016).

Seed multiplication

Seed varieties are multiplied and sold as certified seed by a variety of private companies in Malawi. While seed production was in the hands of a single public company until the early 1990s – the National Seed Company of Malawi – after liberalisation, various international and national seed companies entered the market. In 2019, there were 26 companies on the market (three international seed companies and 23 national seed companies) (see Table 3).

All of them have in-country multiplication activities, mainly due to the fact that only locally produced seed is eligible for distribution through FISP.

Table 3: Seed companies in Malawi

Category	Number of companies	Seed production volume (annual)
Small companies	10	Up to 500 MT
Medium-sized companies	10	500-1,000 MT
Large companies	6	Above 1,000 MT

Source: Personal communication STAM, 2019

The multiplication activities of the private companies mostly take place through out-grower schemes (smallholder seed growers) and by contracting specialised seed growers (large and medium-scale seed growers). Companies also have their own farms for multiplication, but these constitute only a small percentage of the total. All seed multiplication activities need to be registered with SSU.

When it comes to maize, the KIIs indicated a clear preference by seed companies to work with seed growers with at least 10 ha, because of the need for isolation to avoid seed contamination (300-500 m in the case of hybrid maize, depending on company requirements). The contractual conditions are usually such that the seed company supplies the basic seed material, while the seed growers need to purchase all other inputs themselves. All companies conduct their own quality inspections to ensure seeds are not contaminated.

For other crops such as legumes, smallholder out-growers are more common and there are few larger seed growers interested in this. Overall, most formal seed multiplication takes place for maize (all seed companies), followed by beans, groundnut and soybeans (Mabaya et al., 2017). In addition, informal farmer-saved seed and community-based seed multiplication schemes exist, mostly for pulses but also for cassava and other crops. Such community-based seed schemes are often supported by NGOs and/or international research centres.

Seed distribution and marketing

Farmers have access to certified seeds through the following channels: private agro-dealers (individual and chain stores), the state-owned Agricultural Development and Marketing Corporation (ADMARC)¹, private supermarkets and similar retail outlets, and NGOs. Most certified seed distributed through these channels is focused on beans, maize, groundnuts and soybeans. Certified cowpea and pigeon pea seeds are also available, albeit in much smaller quantities.

Out of the four formal channels, agro-dealers are the main outlet for certified seed. According to estimates by RUMARK, there are approximately 7,000 agro-dealers in Malawi – most of which are located near tarmac roads or in trading centres, with few agro-dealers in the rural areas (Mabaya et al., 2017). Most agro-dealers are very small shops with an annual turnover of less than US\$5,000 and some only open as maize planting begins (seasonal

¹ Apparently not active in 2019 due to lack of funding.

shops). About 100 agro-dealers are larger in size (estimated turnover of approximately US\$12,000) and serve several smaller agro-dealers.

Due to widespread and persistent problems of default among agro-dealers to repay seed companies for the seed received, the latter are increasingly wary of working with large numbers of agro-dealers, and seek to focus on smaller sets of ‘trusted’ agro-dealers, agro-hubs or retail outlets such as supermarkets instead. For example, one of the seed companies interviewed worked with 150 agro-dealers in 2016 but downscaled this to 76 in 2017, 25 in 2018 and just five in 2019 because of overwhelming default rates.

Most certified seed is financed by the government through FISP, which distributes vouchers to farmers to access maize and legume seeds in agro-dealer shops. Estimates suggest that the subsidised FISP market makes up 80% of the certified seed market. The commercial seed market – where large-scale or smallholder producers purchase seed directly – only constitutes a very small percentage of the market (Figure 2).

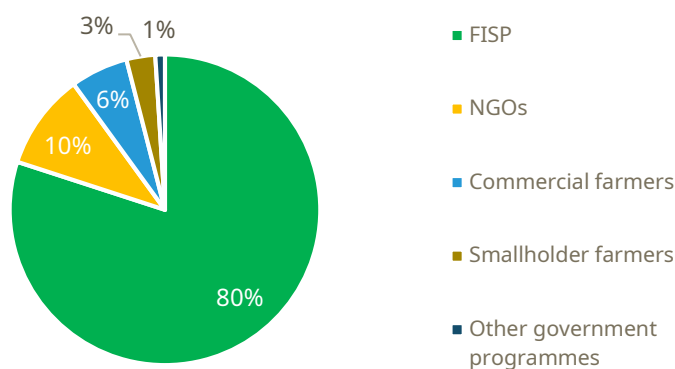


Figure 2: Distribution (by volume) of certified seed through different channels

Source: Personal communication STAM, 2019

The small commercial seed market shows that certified seed in Malawi is beyond the reach of most smallholder farmers if they have to purchase it on commercial terms (FAO, 2019). Therefore, a large amount of seed used by farmers is accessed through the informal seed system (Phiri & Phiri, 2017). This is not only because of the high costs of certified seed, but also because some rural areas are underserved by agro-dealers (or other outlets) and for many crops planted by farmers, there are no improved varieties readily available on the market.

In addition to the domestic seed market, Malawi also exports surplus seed. For instance, in 2016/2017, Malawi produced over 23,000 MT of seed, of which, 39% was exported to neighbouring countries, contributing over US\$20 M in foreign currency (USAID, 2018).

Seed use

When looking across crops, farmers predominantly use farm-saved seed for agricultural production. A recent study by USAID (2019) estimates that 70% of all seed used by smallholder farmers comes from informal sources, versus 30% of certified seed. However, adoption of certified varieties varies per crop and also according to different studies (Table 4).

Table 4: Adoption rate of improved seed varieties among smallholder farmers

Crop	Adoption of improved varieties	Source/study
Maize	46% (by households; in 2010)	MOAIWD, 2018
Maize	67% (by plot area; in 2016)	Audet-Belanger et al., 2016
Maize	50.2% (by households; in 2017/18) (+ 10.8% using hybrid and local maize mixed)	Westengen et al., 2019
Maize	56.2% (by households; in 2010) 40.5% (by plot area; in 2010)	Sheahan and Barrett, 2014
Pigeon pea	14% (by households; in 2008)	Simtowe et al., 2016

Source: own compilation

While these figures vary, there is general consensus that (a) use of certified (mostly hybrid) seed is higher for maize than for other crops and (b) use of certified seed has increased as a result of the introduction of the FISP programme in 2005 (Sheahan and Barrett, 2014; USAID, 2019).

Quality assurance

Seed certification is done by SSU of DARS. The SSU seed testing laboratory is accredited to the International Seed Testing Association. The main constraint of the SSU is low funding and limited numbers of qualified personnel to conduct the required inspections across dispersed seed multiplication sites. There are currently 37 seed inspectors distributed across three regions. Limited transportation resources have led to the common practice of asking seed companies to offer inspectors transport for the inspection of their seed fields (Mabaya et al., 2017). Corruption in seed inspection exercises has also been noted (FAO, 2019). While seed stakeholders indicate that cases of fraudulent inspections have decreased with the new management of SSU, which came into place two years ago, seed companies indicated that the practice of providing transport and food allowances to inspectors are clear biases in their favour.

Because of the delays in seed certification and general controversies around SSU, donors and stakeholders, such as the Seed Traders Association of Malawi (STAM), have demanded for years that the SSU becomes a semi-autonomous National Seed Commission to avoid confluence of political and economic interests (Westengen et al., 2019). This component is also included in the new Seed Bill, which is also being pushed by AGRA.

In addition to SSU, STAM takes on a quality control function within the seed system. STAM indicates that it typically visits all seed companies on a biannual basis, checking warehouses and packaging processes. STAM also accredits and checks agro-dealers on behalf of the government, by offering training and certification to registered agro-dealers.

Notwithstanding these mechanisms, quality control in the sales and marketing process remains a challenge resulting in prevalence of fake and counterfeit seeds (Audet-Belanger et al., 2016). Under the current system there are few prosecutions, and penalties do not seem to deter malpractices (Audet-Belanger et al., 2016). At the same time, it should be noted that the actual extent of fake and substandard seeds being sold on the market has not yet been established (AGRA, 2019c).

Seed policies and governance

Malawi launched its revised National Seed Policy in 2018, which defines the minimum standards for the regulation, production control, processing, sale, importation, exportation and testing for the certification of seed. Legislation focuses exclusively on the formal seed sector and improved (certified) seed varieties (FAO, 2019).

Official seed legislation revisions started in 2013 and, after years of delay, are currently in the process of final government approval before ratification by parliament. All stakeholders interviewed emphasised that the existing seed legislation is inadequate to promote industry development. A central tenet of the new seed legislation is that SSU, under the MOAIWD, is moved to become a semi-autonomous National Seed Commission to avoid the confluence of political and economic interests (Westengen et al., 2019).

Malawi is a signatory to the Common Market for Eastern and Southern Africa (COMESA) and Southern African Development Community (SADC) seed harmonisation protocols. Under existing legislation, however, there is insufficient alignment to these protocols and many of the advantages of a harmonised seed regulatory system, e.g. seed variety testing and release, cannot be utilised.

Regarding sector governance, in addition to MOAIWD – the central authority in charge of seed sector development – STAM has developed to become a strong association with effective working relationships with the seed sector's main actors. Established in 2004, STAM's mandate is to strengthen the seed industry by contributing to relevant agricultural policies in order to develop Malawi's economic development, and subsequently, promote rural development. All seed companies active in Malawi (currently 26), are part of STAM. Its key activities revolve around organising seed companies, exercising quality control, offering capacity development and influencing policy-making. Other important organisations involved in governance of seed sector include the National Smallholder Farmers Association of Malawi (NASFAM), the largest smallholder-owned membership organisation in Malawi, and the Farmers' Union of Malawi (FUM), an umbrella body of small, medium and large farmers and farmer organisations in Malawi.

Box 1. FISP

FISP was introduced in 2005/06 after two severe food crises which prompted the government and development partners to reconsider the previous abolishment of subsidies during the structural adjustment period. The core objective of FISP is to improve resource-poor farmers' access to improved agricultural inputs in order to raise productivity and ensure national food self-sufficiency. The programme operates through distributing vouchers or coupons for fertilisers and hybrid seeds – initially exclusively for maize and since 2007/08, complemented by legume seed. In the 2019/20 season, 900,000 selected beneficiaries received vouchers for:

- 5 kg of maize seed (farmers' choice of which maize variety, including OPV or hybrid) or 7 kg of improved sorghum seed or improved rice seed;
- 1 kg of beans or groundnut seed or 2 kg of soya beans, pigeon peas or cowpea seed;
- 50 kg of basal NPK fertiliser;
- 50 kg of top-dressing urea fertiliser.

This translates into a volume of 4,500 MT of subsidised maize seed and 900 MT of legume seed. Distribution of the subsidised inputs started exclusively through two parastatal corporations (ADMARC and the Smallholder Farmers Fertilizer Revolving Fund of Malawi, SFFRFM), but was quickly opened to private sector companies. For this season (2019/20), the government has introduced a tender system, which requires companies to submit delivery intent and then receive government approval on whether they are allowed to supply through their usual distribution network (e.g., agro-dealers). Farmers are free to choose the specific seed variety and brand, but may need to top up their subsidy in case they pick expensive seed. FISP sales open in November and close in February each year.

Since its beginning, FISP has been a controversial programme, characterised by strong political considerations. At the same time, the programme could demonstrate early successes in raising maize yields from 1.3 MT/ha before 2005/06 to around 2 MT/ha with the introduction of FISP in the 2005/06 production season (MOAIWD, 2016). Yield increases were most significant between 2005 and 2007, but since then, yield growth has broadly stalled, and fallen sharply during droughts or floods (World Bank, 2019).

Furthermore, FISP has contributed to the development of the seed sector due to the company incentives it provides to operate in the country. This includes the establishment of more local seed companies (Audet-Belanger et al., 2016). Estimates suggest that seed companies earn 50-60% of their revenues from FISP sales (ibid).

Criticism of FISP has not stopped, however. One of the main concerns is that FISP accounts for approximately 75% of the national budget for agriculture and therefore, comes at the expense of critical measures to promote productivity such as irrigation and extension services (e.g. World Bank, 2019). Because of Malawi's heavy reliance on foreign aid, this brings the programme's sustainability into question.

Overall, the following strengths and weaknesses of the seed system in Malawi can be identified (Table 5).

Table 5: Overview of the seed system in Malawi

Actors	Strengths	Weaknesses	Opportunities for improvement	Priority	
Variety development	<ul style="list-style-type: none"> DARS International seed companies CGIAR (IITA, CIAT, CIMMYT, ICRISAT) Universities (Lilongwe University of Agriculture and Natural Resources, LUANAR) 	<ul style="list-style-type: none"> Available breeders Varieties are released by public and private sector Existence of Plant Variety Protection act Regime harmonisation (member of SADC) 	<ul style="list-style-type: none"> Policy implementation Long variety release process Access to germplasm Resource constraints of public research, including infrastructure challenges 	<ul style="list-style-type: none"> Regional harmonisation of variety release is critical New (drought-tolerant) varieties for food crops should be developed 	4

	<ul style="list-style-type: none"> • Agricultural Technology Clearing Committee 				
EGS production	<ul style="list-style-type: none"> • DARS • International seed companies • National seed companies: Global Seed, MUSECO • CGIAR • LUANAR • SSU 	<ul style="list-style-type: none"> • Increased demand for EGS • Supportive policy environment 	<ul style="list-style-type: none"> • Limited quantities of germplasm /parent material (especially DARS has supply issues) • Difficult access to finance • No clear communication between demand and supply (no clear picture of demand) • High staff turnover at public research and lack of qualified staff 	<ul style="list-style-type: none"> • Strengthening EGS production by mapping demand • Increase EGS production for food crops 	2 (gateway to commercialisation) 4
Seed multiplication	<ul style="list-style-type: none"> • Seed growers • Out-growers • Community-based seed production • Farmers • NGOs • Seed companies • SSU 	<ul style="list-style-type: none"> • Open to everyone • In country production is high • Existence of different models: seed growers, out-growers and community-based production 	<ul style="list-style-type: none"> • Capacity gaps for seed production • Quality issues in community-based seed production • Compromised seed quality with out-growers: fields are small • Weak quality control capacity of SSU • Financial resources to buy back the seed 	<ul style="list-style-type: none"> • Training of seed producers, especially of community-based seed production schemes 	2 3 (licensing of seed producers)
Distribution and marketing	<ul style="list-style-type: none"> • Seed companies • Agro-dealers • NGOs • Farmer (organisations) • SSU • Village-based agencies 	<ul style="list-style-type: none"> • Large network of agro-dealers • Seed fairs by NGOs • Distribution through FISP • Agro-dealer support by RUMARK • Licencing of seed sellers through STAM • Availability and 	<ul style="list-style-type: none"> • Lack of coordination • Lack of a competitive market (FISP) • Fake seeds spread in market • Storage facilities by agro-dealers • High default rates by agro-dealers • Lack of agro-dealers in 	<ul style="list-style-type: none"> • Mapping outlets and farmers • More outlets in villages • Enforcement of standards • Training of agro-dealers • Control mechanisms to ensure payment by agro-dealers 	2 1 (clear, defined demand of seed and grain)

		accessibility of seeds	remote rural areas			
Seed use	<ul style="list-style-type: none"> • Farmers • Extension workers • Transporters • Sellers 	<ul style="list-style-type: none"> • High farmer awareness of improved seeds and usage, especially for maize and rice • Improved adoption • Subsidised access through FISP • Wide range of varieties for different crops 	<ul style="list-style-type: none"> • Affordability limits farmer demand for certified seed • Perceptions • Access to other inputs (complementary to seeds) • Lack of access to market for grains (low prices) 	<ul style="list-style-type: none"> • Sharing experiences among farmers/farmer organisations • Improve grain market • Contract farming • Investments in value addition (processors, e.g. feed, oils) 	1	1
Quality control	<ul style="list-style-type: none"> • SSU • STAM • RUMARK • Seed companies • Independent labs 	<ul style="list-style-type: none"> • Seed certification scheme • International Seed Testing Association-accredited testing lab • Trained personnel 	<ul style="list-style-type: none"> • Few inspectors • Lack of SSU resources • Weak regulation enforcement • Weak sanctions for non-compliance • High certification fees 	<ul style="list-style-type: none"> • Private seed inspectors and accreditation of private companies with good labs • Build SSU capacity (people and mobility) • Online seed inspection • Controlled labelling by regulating and scratch card system 	1	2 (comment: better quality)
Policies and governance	<ul style="list-style-type: none"> • Government • STAM • Donors • Universities • Farmers: FUM, NASFAM • RUMARK • Civil Society Agriculture Network 	<ul style="list-style-type: none"> • Consultative policy-making process • Seed policy in place • 2018 seed regulation • Presence of political will 	<ul style="list-style-type: none"> • Enforcement • Revised act not in place • Coordination of key actors 	<ul style="list-style-type: none"> • Harmonisation with SADC and COMESA regulations • Passing of Seed Act 	3	3

Source: Stakeholder workshop, 2019; priorities indicated by stakeholders on a scale of 1 (very high priority) to 5 (very low priority)

4.2 AGRA change ambition

AGRA's point of departure

AGRA has worked in the Malawian seed system since 2007. For the first couple of years, it focused on breeding capacity by supporting DARS staff to receive training. This way, AGRA supported five PhDs in plant breeding and 16 MScs in agronomy. By means of these capacity building investments, AGRA supported the development of 31 crop varieties, out of which, 24 were commercialised. To increase the availability and accessibility of seed for smallholder farmers, AGRA then provided eight seed companies with catalytic grants to

upscale production and marketing of improved seed varieties. This happened mainly in the SSTP programme, which supported seed production on diverse crops: beans, cassava, cowpea, maize, pigeon pea, rice and sweet potato.

After the SSTP programme came to an end in 2018, AGRA analysed the remaining gaps in the seed system (Table 6) and identified a number of key priorities (AGRA, 2019c):

- Increase EGS production to supply the market;
- Improve seed companies' business models and integration into the larger network of market actors;
- Support a clear and enforceable policy and regulatory environment.

Table 6: Seed system status according to AGRA

Registration process for seed producers	Variety development	Variety release and registration by government	Supply of quality EGS	Seed inspection services	Quality assurance system	Seed packaging and labelling requirements	Seed importation and exportation procedures	Agro-dealer network for seed marketing and sales	Government institutional arrangements	Seed association	Implementation of regional seed harmonisation

Source: adapted from AGRA, 2019c

Explanation: green = good; yellow = marginal

In view of the gap analysis above, AGRA's current investments in the seed system focus on seed production, distribution and the policy environment. There are also activities on seed uptake and use, but these are relatively minor. Committed investments just exceed US\$1 million at this stage. Two projects are funded through IFAD² and three receive funding through BMGF (Table 7).

EGS production

Firstly, AGRA supports EGS production in legumes and maize to deliver high-quality foundation seed to seed companies, individual seed growers and NGOs. Towards this purpose, it has awarded grants to:

- DARS for breeder seed production of legumes (beans, cowpeas, groundnuts, pigeon peas and soybean);
- MUSECO for foundation and basic seed production of legumes (beans, cowpeas, groundnuts, pigeon peas and soybean);
- Global Seeds for foundation and basic seed production of drought-tolerant maize and rosette-resistant groundnut varieties.

Seed multiplication

MUSECO is also tasked with legume certified seed production, which is supposed to take place by means of community-based production schemes in the implementation districts of SAPP.

² The IFAD-funded interventions focus on the specific districts included in the SAPP project (Balaka, Blantyre, Chiradzulu, Chitipa, Lilongwe and Nkhotokota)

Seed distribution and marketing

AGRA supports the improved distribution of seed (and other inputs). The main project, carried out by RUMARK, includes linking (legume) seed suppliers to selected agro-dealers, training start-up agro-dealers, and supporting larger hub agro-dealers to enable them to supply smaller agro-dealers with quality inputs (the so-called 'hub and spoke' model).

Seed use

While not the core focus, AGRA's projects, as described above, also entail a component of direct farmer contact for awareness raising and increased uptake of certified seed.

Seed policies and governance

On a policy level, AGRA has extended two grants – one to the Department of Agricultural Planning Services and one to FUM – to build momentum for the enactment of the Seed Bill by gazetting and awareness creation, e.g. among farmers. Key stated objectives of these two grants include:

- Reduction of required research time before new varieties introduced;
- Establishment of national seed commission with better capacity to check seed development for certification;
- Establishment of private seed inspections;
- Harmonisation of seed regulations with regional SADC and COMESA requirements;
- Increase penalties to discourage malpractices.

Table 7: AGRA Malawi investments in seed system development

Seed system components	Envisioned change	AGRA investments	Timing	Intervention	Implementing partners
EGS production	Increased continuous production and availability of high-quality foundation seed of hybrid maize and groundnut seed in Malawi	US\$221,200 ³	November 2018 – May 2021	Planned outputs: <ul style="list-style-type: none">• 120 MT of groundnut foundation seed• 15 MT of hybrid maize foundation seed	Global Seeds
	Increased availability of seed for smallholder farmers by promoting EGS production	US\$128,489 ⁴	June 2018 – August 2020	Planned outputs: <ul style="list-style-type: none">• 31 MT of pre-basic legume seed• 54 MT of basic legume seed	MUSECO
	Increased availability of seed for smallholder farmers by promoting EGS production	US\$77,400 ⁵	June 2018 – May 2020	Planned outputs: <ul style="list-style-type: none">• 21 MT of legume breeder seed by DARS• Training of DARS staff	DARS

³ Total grant to Global Seeds. No differentiation between activities per seed system component.

⁴ Total grant to MUSECO. No differentiation between activities per seed system component.

⁵ Total grant to DARS. No differentiation between activities per seed system component

Seed multiplication	Increased availability of seed for smallholder farmers by increasing improved seed production	US\$128,489	June 2018 – August 2020	Planned outputs: <ul style="list-style-type: none"> • 500 MT of certified seed produced 	MUSECO
Marketing and distribution	Strengthened capacity of hub and rural agro-dealers to improve delivery of seeds, fertilisers and extension services to smallholder farmers	US\$135,207	August 2018 – December 2019	Planned outputs: <ul style="list-style-type: none"> • 50 agro-dealers linked to input suppliers • 80 start-up agro-dealers trained • 8 new seed varieties promoted • 8 hub agro-dealers trained in business management 	RUMARK
Seed use	Increased farmer awareness of the advantages of using high-quality seed of improved varieties and appropriate agronomic practices	US\$128,489	June 2018 – August 2020	Planned outputs: <ul style="list-style-type: none"> • 20 demonstrations conducted • 10 field days conducted • One roadshow conducted • Five short videos produced • Four radio messages aired • 5,000 farmers reached 	MUSECO
		US\$77,400	June 2018 – May 2020	Planned outputs: <ul style="list-style-type: none"> • Five demonstrations mounted • Three field days conducted • Two TV programmes produced • Three radio messages aired 	DARS
	Increased awareness of seed companies, NGOs and private seed producers about EGS produced by Global Seeds	US\$221,200	November 2018 – May 2021	Planned outputs: <ul style="list-style-type: none"> • Two field days and 30 demonstration plots established • 200 smallholder farmers trained on agronomic practices for seed production 	Global Seeds
Policies and governance	Strengthened agricultural enabling policy environment through support to Seed Bill enactment	US\$235,369	September 2018 – May 2020	<ul style="list-style-type: none"> • Facilitate non-state actors' inclusion into the consultation and validation process for the draft Seed Bill • Revise the Seed Bill in line with the National Seed Policy 	FUM

Strengthened agricultural enabling policy environment through support to Seed Bill enactment	US\$235,369	October 2018 – September 2020	<ul style="list-style-type: none"> Organise stakeholders for approval and launch of the Seed Bill Engage with governmental bodies to support legislative procedures 	Department of Agricultural Planning Services
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4.3 AGRA system change results

EGS production

AGRA promotes EGS production in two projects with three grantees (all of whom have been received AGRA support previously):

- DARS and MUSECO project: EGS production concerns beans, cowpeas, pigeon peas and soybeans. DARS is contracted to supply the respective breeder seed to MUSECO, who then produces foundation and basic seed with the help of out-growers. So far, DARS has produced 10 MT of legume breeder seed. For foundation seed production, MUSECO has contracted three out-growers (one of whom is the MUSECO owner in a private capacity) who have produced 27 MT of legume foundation seed so far. According to the company, the amount of foundation seed to be produced does not allow for more out-growers to participate. In addition, the company has contracted eight out-growers for basic seed production (for the 2019/20 season). It should be noted that in the previous season, the company had engaged 80 out-growers, but since these were small out-growers, monitoring costs became too high and the company decided to downscale its out-grower network to a select few with increased land sizes. So far, 289 MT of basic legume seed have been produced through MUSECO.
- Global Seeds project: Global Seeds has been contracted to produce EGS of rosette-resistant groundnut and drought-tolerant hybrid maize. So far, Global Seeds has produced 16 MT of groundnut EGS (out of 120 MT targeted by May 2021) and 3 MT of maize (out of 7 MT targeted). The reason production has been lower-than-expected is the result of poor access to groundnut breeder seed, which Global Seeds sources from ICRISAT where production has been lower than anticipated.

Increased EGS production

The MUSECO/DARS and Global Seeds projects increase quality EGS availability of selected crops for the Malawian market. This is particularly beneficial for seed companies that do not engage in EGS production – most national seed companies – and depend on accessing basic seed for seed multiplication. While greater EGS availability could lead to reduced prices for seed companies, as emphasised by the grantees, it is not clear whether this is actually the case. DARS also usually provides EGS to companies, although heavily constrained, at subsidised rates. The quantities produced by the two companies are also too low to expect a significant impact on prices. Thus, improved EGS availability is a logical outcome of these projects, but not necessarily reduced prices.

Improved EGS availability also does not equate to increased EGS demand. Several interviewees raised concerns about Malawi's relatively small EGS market, as international seed companies – by far the dominant players on the market – carry out their own EGS

production. The only EGS seed off-takers are national seed companies, and whilst their number has drastically increased in recent years, their seed production volume is low and hence, their EGS demand is also low at this stage. Both MUSECO and Global Seeds – currently the only private companies producing and selling EGS in Malawi – have recently ventured into certified seed production because of limited off-takers for EGS.

Enhanced task division in the EGS production process

Increasing foundation and basic seed production through private companies reduces the pressure on DARS to provide EGS to Malawian seed companies – on top of the breeder it already provides. Instead, DARS can strengthen its focus on breeder seed production, which needs to be done under close supervision of a breeder and hence, cannot easily be done by private companies. As such, the two projects contribute to enhanced task division in the EGS production process. The MUSECO and DARS project has a particularly important function in this regard, as it also strengthens public-private collaboration in the seed system.

Strengthening seed out-growers

The projects contribute to strengthening seed out-growers through technical assistance and supervision where required, as most of the EGS are produced by out-growers contracted by MUSECO and Global Seeds. However, the out-growers are not necessarily smallholder farmers. For hybrid maize in particular, but also for legumes (only OPVs), it may not be financially or logistically feasible (or attractive) for seed companies to work with small out-growers because they need to ensure the seed is not contaminated with that of neighbouring farmers' seed. This should be monitored in future for a better understanding of EGS out-growers.

Certified seed production

AGRA promotes certified seed production through the MUSECO project, whereby the company uses the EGS produced to supply to out-growers for certified seed production. While MUSECO was founded as an EGS-producing seed company, it indicated that because the EGS market in Malawi is small, it uses the project to venture into certified seed production and thereby extend its supply chain. Thus, the EGS produced are given to community seed grower groups (or 'clubs') to deliver a total of 500 MT of legume seed over two seasons (production so far: 126 MT of certified seed). The target for the first season was to work with 10 seed grower clubs, but due to high demand, MUSECO worked with 65 clubs, comprising around 735 smallholder members. The grower groups were given the basic seed on credit and were contractually obligated to sell the certified seed back to MUSECO after multiplication. Inspection and certification costs were borne by MUSECO.

Although the project exceeded the target of working with 10 seed grower clubs in the first season, there were issues with side selling. MUSECO observed that individual farmers chose to sell the certified legume seed on the informal market as legume grain, or even to other seed companies. As a result of the side selling and associated financial losses, MUSECO has decided to work with around 30 seed grower clubs for the second season. The clubs that did not sell the certified seed back to MUSECO are excluded. Contractual conditions have also changed; instead of supplying farmers with basic seed on credit, farmers will need to purchase the seed stock in cash, or at least partially, and offer a security in return (e.g. land title).

With regard to certified seed production, the main outcome of this project is building and maintaining relationships between MUSECO and community grower groups. While

MUSECO stands to benefit from entering into certified seed production to expand its business model, the community groups can benefit from close supervision by the company in terms of technical capacity building, and stable market access for certified legume seed.

Seed use

The MUSECO/DARS and Global Seeds projects also entail working directly with farmers for increased awareness of the advantages of improved seed. These are essentially promotion activities to encourage greater uptake of the certified seed produced by the projects, and include various outreach activities, such as demonstration plots, field days, radio and TV messages. So far, 13 demonstrations have been conducted by MUSECO, 10 by DARS and 50 by Global Seeds. However, concrete outcomes of these projects cannot be observed due to lacking data at farmer level.

Seed marketing and distribution

At the time of the study, AGRA worked specifically on seed marketing and distribution through two projects:

- RUMARK project: Similar to the project with MUSECO and DARS, this project is currently active in Lilongwe and Nkhhotakota districts, which are also the implementation districts of SAPP. This serves to create linkages to SAPP. As part of the project's objectives to strengthen agro-dealers and improve input delivery to farmers, RUMARK works on developing hub agro-dealers who, in turn, serve and supply smaller agro-dealers. Twelve hub agro-dealers have been trained since the start of the project in August 2018 in the two target districts, in addition to the training of 86 smaller (start-up) agro-dealers connected to these hubs. RUMARK has also conducted a Geographic Information System mapping exercise in the two districts to estimate the distance from farmers to agro-dealers.
- MUSECO and DARS project: In addition to the RUMARK project, the MUSECO and DARS project also comprises a small marketing and distribution component. The company works with village-based agribusinesses – essentially smallholder cooperatives – and trains them to become registered agro-dealers. For the first season of the project in 2018, two cooperatives, one with four outlets and one with five, were trained and registered. The official target of the project is to work with 36 village-based agribusinesses, but MUSECO has already indicated that this is a learning exercise. It remains to be seen whether the company is able to achieve its official target.

These projects are intended to strengthen organisation of the agro-dealer and distribution network. By focusing on building the capacity of larger hubs, the idea is to reduce credit default rates (based on the indication that agro-dealers are more likely to repay other agro-dealers than seed or fertiliser companies), improve the availability of quality products, reduce order (transaction) costs for small agro-dealers, and improve input quality control through hub supervision. If successful, these steps will help to rebuild seed company trust in agro-dealers, and improve overall availability and accessibility of quality inputs.

Seed governance and policy

Revisions to Malawi's Seed Act started about 10 years ago, that is, long before the AGRA project commenced. However, according to interviewed stakeholders, the challenge was that the first revision process was driven by civil society rather than the government, which led to a lack of ownership on the part of the latter. Eventually the government took over the

process and re-drafted the Seed Act based on stakeholder consultations. The seed traders' organisation, STAM, was a key stakeholder in the process.

But, despite wide-ranging stakeholder support, the process of legislative revisions stalled and experienced continuous delays. Therefore, AGRA extended two grants to FUM and the Department of Agricultural Planning Services to reinstate momentum and finalise the legislative process. This included getting (final) input from stakeholders and ensuring that the Seed Bill was aligned to the Seed Policy. For example, FUM conducted a rapid assessment of the seed sector and organised consultations with farmers and the private sector to identify the priorities of these groups with regard to the Seed Bill. Through this activity, it emerged that sector governance was an issue of high concern among farmers, as the Seed Bill proposes the establishment of a semi-autonomous seed commission. FUM therefore pushed for representation on the seed commission board, which was achieved.

At the time of the study, the Seed Bill was with the Ministry of Justice to be formatted properly and checked for its alignment with existing law. FUM indicated that they expected the Bill to be with the Office of the President and Cabinet by the end of January 2020, and for it to be presented to parliament by February 2020. After parliamentary approval, the Seed Bill will turn into law as the Seed Act.

Interviewed stakeholders were unanimous in their assessment of the seed sector's existing legislative framework being outdated, and not catering for a liberalised market with diverse public and private actors. They also voiced the expectation of the new Seed Bill having several advantages for the Malawian seed sector (Table 8).

There are, however, also critical voices on the Seed Bill and its alignment with the 2018 National Seed Policy. Several civil society organisations have expressed concern that the new legislative framework contains an explicit bias toward commercialisation and formalisation, while neglecting the informal seed system (Westengen et al., 2019). These organisations are aware that while government policy recognises the existence of the informal seed system and its role in reaching farmers who cannot be reached by the formal sector, it does not aim to improve farmer-saved seed systems.

It should be noted that the Seed Bill was already in preparation for several years before AGRA's interventions, and lobbying for its approval had already been carried out by other stakeholders. It is therefore impossible to assess the contribution of AGRA to the envisaged changes in legislation.

Table 8: Expected benefits from new Seed Act

Legislative changes	Expected benefits
Establishment of semi-autonomous institution called 'National Seed Commission of Malawi'	<ul style="list-style-type: none"> • Enhanced operations of the seed certification and quality control unit (currently SSU) • Improved monitoring and quality control through the registration of seed producers and agro-dealers dealing with seed • Establishment of an inventory of all relevant stakeholders in the seed industry (databank)

Harmonisation of seed regulations with those of SADC and COMESA	<ul style="list-style-type: none"> • Opening up of the Malawian market to companies from SADC and COMESA countries to reduce seed costs and improve availability • Facilitation of Malawian companies to export seed and enter regional markets • Reduced time and costs of variety release if varieties have already been released in two SADC/COMESA countries • Commercialisation of better performing varieties developed in similar agroecologies in other countries
Intention to develop standards for packaging, labelling and seed treatment materials	<ul style="list-style-type: none"> • Improved transparency to facilitate farmer verification of seed • Reduced fake and adulterated seed in the market • Potential introduction of scratch card system to the market
Increased penalties for malpractices	<ul style="list-style-type: none"> • Reduced fake and adulterated seed in the market
Private sector seed inspection	<ul style="list-style-type: none"> • Enhanced seed certification and quality control • Reduced seed certification

Source: own compilation based on stakeholder interviews, 2019. Note: list of legislative changes and benefits not complete.

4.4 Analysis of AGRA results

AGRA's position in the intervention landscape

The seed sector in Malawi has received and still receives support through various development projects. Several projects have an exclusive focus on seed, whereas others are agriculture-based projects with a seed component. This shows that attention to the seed sector is high in Malawi. It appears, however, that most projects focus on variety development and seed use (research-into-use) of the developed varieties. Support to private sector companies, e.g. for EGS production, seems to be relatively limited. Thus, AGRA projects do not duplicate but rather complement existing activities, focusing on supporting the private sector companies through training, financial support and other activities.

Projects relevant to AGRA's interventions include:

- The Malawi Seed Industry Development Project Phase II (2016-2020), funded by Irish Aid and implemented together with CIAT, DARS, ICRISAT and the Legumes Development Trust, introduces certifies new legume varieties;
- Root and Tuber Crops for Agricultural Transformation in Malawi (2016-2021) is funded by Irish Aid and implemented by the International Potato Centre. The project works to ensure that farmers have access to productive, climate-resilient and nutritious varieties of cassava, potato and sweet potato;
- The Malawi Improved Seed System and Technologies (2014-2019) project, funded by the United States Agency for International Development (USAID), is a consortium-based project to improve the availability of drought and stress-resistant maize seed for smallholder farmers;
- USAID's Agricultural Diversification project (2016-2021) works on orange-fleshed sweet potatoes, peanut and soybeans, and includes distribution of improved seed.

This project works with tobacco farmers to diversify their production, together with ICRISAT;

- The Southern African Seed Trade Project by USAID (2015-2019), implemented together with STAM and DARS, aims to harmonise seed systems with SADC seed protocol using an online certification system;
- The Soybean Innovation Lab (2013-2019) works in Malawi with DARS, ICRISAT and IITA to test seed varieties for interesting traits;
- The Soy Seed Multiplication project (2018-ongoing) of the Interchurch Organization for Development Cooperation, a Dutch NGO, with funded from Solidaridad, works with three farmer cooperatives on seed multiplication and marketing to farmer members.

Relevance of AGRA's interventions

In order to achieve its primary objective of increasing farmer-level income and food security, AGRA's interventions have, for the large part, focused on certified seed supply chain development, of creation of an enabling policy environment to support the certified seed system.

Support to certified seed supply chain

AGRA has managed to support each component of the Malawi's certified seed supply chain. But whilst this is certainly a laudable achievement, it should be noted that not all stages of the chain require the same level of support. AGRA's support for private EGS production is significant, however, the EGS production companies indicated during KIIs that occasionally, EGS are sold as certified seeds because of lacking EGS demand.

AGRA could reassess bottlenecks in the supply chain to guarantee its support is received where it is most relevant. This also applies to its activities in seed multiplication (certified seed production). For instance, while there is little doubt that certified seeds can yield a positive business case, a large proportion of the smallholder farmers continue to rely on the informal market. As such, the market for certified seed is largely attributed to the government's purchase of large quantities of certified seed every year. To reach a larger number of farmers with certified seed, it is advisable that AGRA integrate market development into its grant scheme, thereby making improved seed affordable to farmers.

Limited attention to improved seed use

AGRA Malawi currently does not pay substantial attention to the uptake of improved seed, except for a number of project side activities, e.g., demonstration plots, field days and small input packs. This is understandable given that projects are relatively small and should not lose focus. However, AGRA may want to consider focusing more on farmer outreach to create incentives for farmers to adopt improved seed varieties. Stakeholders interviewed indicated that, in addition to financial constraints, farmers may not use improved seeds because of lacking knowledge on agricultural practices, or because remunerative output markets for improved seed crops are not available. Farmers may therefore explicitly choose not to invest in seeds and rather recycle farm-saved seed. Focusing on demand creation could therefore increase the relevance of AGRA's activities in Malawi.

Strengthen agro-dealers as rural service providers

Because of the potential of agro-dealers to reach remote areas and reduce the distance between farmers and products/services, supporting agro-dealers appears imperative. In the current seed and input supply system, however, agro-dealers are often thought to perform

poorly, grounded in poor business practices and lack of training. Input supply companies are therefore looking for alternative ways to distribute their products, e.g. by reducing the number of agro-dealers they work with and by working only with chain stores owned by larger companies, and setting up with the distribution network of these companies. There is thus a threat to the relevance and use of agro-dealers. The hub and spoke model, which is promoted by the RUMARK project, could counteract this trend and re-establish the importance of agro-dealers for rural service provision. Nonetheless, the hub model warrants close follow up to ensure that hub-spoke relationships unfold as foreseen, quality standards improve, and input supply companies regain trust in agro-dealers.

Seed Bill support

Stakeholders were unanimous in their support of the new Seed Bill. This suggests a high relevance of AGRA's efforts to get the Bill passed. Essentially, the Seed Bill will address issues such as seed certification, penalties, variety release and regional harmonisation.

Expected impact

AGRA Malawi has adopted a 'rolling system change' approach, in which the supply system is supported first, and demand (through strengthened financing and extension systems) and market systems thereafter. The investment impacts at a wider system level are yet to manifest, but there are positive indications already. A primary example is the Seed Bill, which is expected to have a great positive impact on the national seed sector. As it was stranded in the legislative process, AGRA's relatively small investments helped to revive and accelerate the process. This suggests that AGRA Malawi can yield results above its spending power through well devised engagements with other partners and public initiatives.

Sustainability

Limited smallholder capacity to afford certified seed remains a key impediment for sustainable market growth. Currently, most smallholder farmers accessing certified seed are able to do so under the subsidy of the FISP programme – or NGO and donor projects. The commercial market for seed remains limited to the estate subsector and a small segment of wealthier smallholder farmers. The growing number of seed companies in recent years, including the emergence of national seed companies, is owed to the existence of a subsidised market, guaranteed each year by the government. One interviewed seed company even acknowledged that without the FISP programme, his business would not be able to survive. Although the programme is highly popular among farmers and important for Malawian politics, it is also costly, its efficiency is disputed, and it is an important limitation on spending in other agricultural areas, such as R&D and farmer services. As such, spending on FISP has decreased in recent years, limiting the number of participating farmers. As this may further limit demand in the coming years, current investments in the supply side may not lead to increased use of certified seeds. In the long term, sustainable growth of the seed sector must be demand-driven.

5 Input system

5.1 System performance

An important component of low agricultural productivity in Malawi is the low use and adoption rates of productivity-enhancing technologies, such as inorganic fertilisers (Simtowe, 2015). While fertiliser application rates have decreased in recent years, the country experiences high annual nutrient depletion rates (Asfaw, Orecchia, Pallante, & Palma, 2018). According to the Government of Malawi, there are currently 25 fertiliser types and brands in the country, which are recommended for various crops and soil types to meet plant nutrient requirements and to boost crop yield. However, smallholder farmers tend to rely on the generic blanket fertiliser. In many cases, the blanket fertiliser, even when used in the recommended quantities, fails to address soil conditions and capacities.

Recently published research by the Food and Agriculture Organization of the United Nations (FAO) flags several issues in the observed regression of Malawi’s soil quality. It established a consistent decline in soil pH in recent years, indicating soil acidification in 40% of each of Malawi’s districts. The country also faces increasing soil loss in virtually all districts. The research found that the rate of soil loss was 26 MT/ha/year in 2010, 29 MT/ha/year in 2014, and 30 MT/ha/year in 2018, indicating an increasing problem. In terms of nutrient loss (N, P and K), the current soil loss rate was found to remove, on average, the equivalent of 3% of a 50 kg bag of blanket fertiliser. As such, the current rate of fertiliser application increasingly compromises yields and economic growth (Asfaw, Orecchia, Pallante, & Palma, 2018).

This sub-optimal fertiliser use is attributed to inefficiencies of both the supply side (non-availability of fertiliser, supply of low-quality fertiliser, high prices) and demand side (lack of capital, imperfect application methods and rates, lack of knowledge on potential benefits) (Simtowe, 2015). Furthermore, there are palpable inefficiencies resulting from the rules and regulations currently in place. Firstly, smallholder farmers typically have only one choice of fertiliser composition (NPK blanket fertiliser for maize), regardless of climatological area, soil quality or crops cultivated. Crop-specific, customised fertiliser recommendations are only developed for export-oriented crops (e.g. cotton, sugar cane, tea and tobacco) by the respective crop boards.

A 2019 AGRA stakeholder workshop identified input system constraints with associated opportunities for improvement and priorities as described in Table 9.

Table 9: Gaps and opportunities in the input system

	Actors	Strengths	Weaknesses	Opportunities for improvement	Priority
Importation	<ul style="list-style-type: none"> Private fertiliser companies Public fertiliser companies (SFFRFM, ADMARC) Ministry of Trade 	<ul style="list-style-type: none"> Private sector with capacity to import 	<ul style="list-style-type: none"> Landlocked and relies on other corridors – particularly Beira Infrastructure Import charges 	<ul style="list-style-type: none"> Room for more players 	6

Local blending	<ul style="list-style-type: none"> • Agricultural Trading Company (repackaging) • Optichem 2000, Malawi Fertilizer Company 	<ul style="list-style-type: none"> • In-country capacity to blend locally (enabling customisation) 	<ul style="list-style-type: none"> • Limited fertiliser demand • Lack of locally available raw resources affect price 	<ul style="list-style-type: none"> • Avail more customised fertilisers and in small packs 	4
Distribution	<ul style="list-style-type: none"> • Private fertiliser companies • Public fertiliser companies (SFFRFM, ADMARC) • Agro-dealers 	<ul style="list-style-type: none"> • The six largest fertiliser companies (the big six) have a large retail network (600 permanent stores and 1,000 during season) • Importers, wholesalers and blenders form part of retailing system 	<ul style="list-style-type: none"> • System locks out smaller agro-dealers (hub) from becoming wholesalers • Distrust between large suppliers and retailers due to defaults • Lack of capital • Big six locking out smaller retailers • No adequate storage facilities to absorb large quantities • Infrastructure 	<ul style="list-style-type: none"> • Country can accommodate more wholesalers • More retailers to go to the last mile 	1
Fertiliser use	<ul style="list-style-type: none"> • Smallholder farmers • Commercial farmers • Estates • Extension agencies 	<ul style="list-style-type: none"> • Farmers in Malawi are aware and understand fertiliser use 	<ul style="list-style-type: none"> • Lack of finance to purchase fertiliser • Long distance to access inputs • Lack of awareness on best practices and different types of fertiliser 	<ul style="list-style-type: none"> • Potential to increase production through adoption and use of improved fertilisers 	3
Quality control	<ul style="list-style-type: none"> • Malawi Bureau of Standards • DARS 	<ul style="list-style-type: none"> • Government capacity for quality assurance 	<ul style="list-style-type: none"> • Non-certification of agro-dealers in the recent past • Regulatory body not in place • Adulterated fertilisers on the market • Weak enforcement 	<ul style="list-style-type: none"> • Self-regulation 	5
Policies and governance	<ul style="list-style-type: none"> • Fertiliser Association of Malawi • Government • Civil society • Donor community • NGOs 	<ul style="list-style-type: none"> • Conducive policy environment • Liberal market • FISP 	<ul style="list-style-type: none"> • Lack of fertiliser policy and act • Lack of formal regulatory mechanism • Lack of awareness (policy) on farmers/users 	<ul style="list-style-type: none"> • Government willingness to accommodate different views on fertiliser • Upcoming policy 	2

Source: Stakeholder Workshop, 2019

The following sections systematically address the functioning of each compartment of the fertiliser supply chain, and ultimately, the policy framework regulating the market.

Importation

In total, there are 67 companies known to be active in the fertiliser input sector, of which, 65 are importing companies. The large bulk of the market is dominated by just six companies, four of which are importing companies. On aggregate, importing companies account for 70% of the fertiliser market; the remaining 30% is addressed by two local producers. Prior to liberalisation in the 1990s, the state-owned SFFRFM had a monopoly on importing fertilisers and marketing them to farmers. Nowadays, all the fertiliser companies are private, except SSFRFM and ADMARC, the latter being 99% state-owned. ADMARC is primarily a buyer of farmer produce but uses its market network to provide input supplies to farmers. The two public fertiliser companies account for 8% of fertiliser imports, the remaining 92% is imported by private companies (Simtowe, 2015). Most fertiliser companies are organised by FAM.

There is an open fertiliser market, and in addition to the four large four importing companies, there are numerous small-scale local importers. Yet, there are various to fertiliser importation. On a regulatory level, importing companies are required to apply for an import permit with both the Ministry of Trade and the MOAIWD for each individual shipment, with processing times taking up to two months. Considering that the fertiliser market is relevant mostly for only about two months each year (during maize planting), this can be constricting for businesses. On an infrastructural level, fertiliser cost and supply are affected by poor regional transport systems. The vast majority of fertiliser is shipped to Beira, Mozambique, and transported from there by truck to Blantyre. As such, fertiliser availability in Malawi can be highly dependent on the operational performance of Beira port. Transport costs account for 60% of the consumer price, 15% of which reflects transportation costs just from Beira into the country. Overall, these barriers amount to significant non-tariff restrictions for importers (AFAP, 2019).

Supply to commercial farmers (sugar, tea, tobacco) is demand driven. They often require soil and crop-specific fertilisers and import on their own account, or place orders with the fertiliser companies. For sales to small-scale farmers, companies are only allowed to offer the government-prescribed blanket fertiliser of NPK 23-10-5-6s-1 zinc.

Local blending

There are currently two local blending companies in Malawi, accounting for 30% of the total market (300,000-350,000 MT) – the locally-owned Optichem 2000 (which has a granulation plant at its disposal) and the Malawi Fertilizer Company (MFC). Optichem 2000 claims to have a total blending capacity of 80,000 MT per year and MFC, 150,000 MT per year. Both companies import all ingredients for their fertiliser (mainly from Nacala and Beira, Mozambique), apart from lime, which can be added for the basification of soil.

The blending companies have over capacity, and this is not expected to change soon under current market conditions. Use of fertiliser has been falling recently, both for commercial farmers – due to the decrease of fertiliser-intensive tobacco farming – and small-scale farmers, due to cut backs to the FISP subsidy programme.

During stakeholder interviews, both the local blending and importing companies mentioned the cost of capital to be their main operational challenge. Agricultural businesses borrow money against interest of over 20%. For importing companies, this is an incentive to keep

stocks low (potentially leading to shortages when confronted with supply chain delays), and forms a barrier to local production investment. Moreover, local fertiliser companies mentioned that the divergent capital cost when compared to multinational companies results in an unlevelled playing field, and creates a challenge in terms of marketing competition.

Wholesale and retail distribution

Smallholder farmers rely on agro-dealers, fertiliser company outlets or occasionally, their contractor in the case of contract farming, to access fertilisers. Despite the existence of a large network of agro-dealers in-country, only 15% of the fertiliser sales take place in Malawi.

Fertilisers are available to agro-dealers but the fertiliser companies indicated they are not willing to supply the agro-dealers on credit. This is due to high historical default rates among agro-dealers and difficulties for suppliers to regain their investments. As such, fertiliser companies make use of their own outlets, or rely on a small network of trusted agro-dealers with whom they have expanded business over the years. For the same reason, the government has excluded agro-dealers from participating in the highly popular FISP programme (although a limited number is allowed to participate this year as part of a pilot project). As part of FISP, 900,000 farmers received a coupon for the 2018-2019 planting season, reducing the price of the typical combination of fertilisers (one bag of 50 kg NPK and one bag of 50 kg urea) from Malawian kwacha (MK) 15,000 (US\$20.36) to MK6,000 (US\$8.14), with the difference subsidised by the government.⁶ Farmers are therefore forced to acquire fertiliser from fertiliser company outlets associated with FISP, meaning they are often unavailable in the more rural areas of Malawi.

Of the 300,000-350,000 MT fertiliser market, estates have historically utilised 110,000-150,000 MT. Sales under FISP account for 150,000 MT and the unsubsidised, open market, for around 50,000 MT, indicating the strong role of subsidies in the market structure. The subsidy volume has reduced from 150,000 MT to 90,000 MT in the last two years, but the subsidy scheme has negatively impacted the fertiliser distribution channel by being inefficient in terms of cost and competitive participation. This has resulted in *de facto* entry barriers to fertiliser companies (AGRA, 2017).

⁶ The number of farmers allowed to participate in FISP is decreasing, e.g. in 2019, the total amount of participating farmers amounted to 1 million

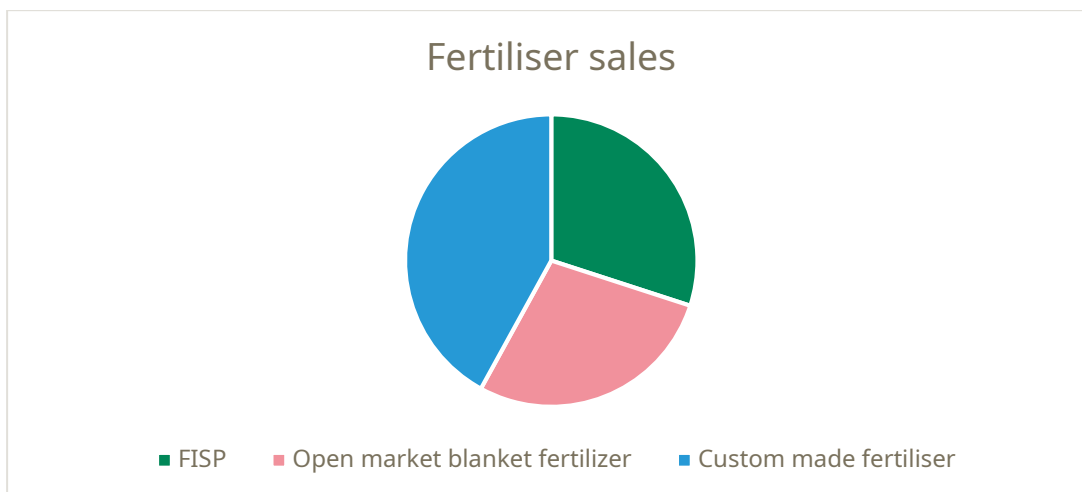


Figure 3: Market segment distribution of fertiliser

Source: stakeholder interviews, verified by IFAP and AFDC, 2017

Historically, the government participated in the fertiliser distribution network through ADMARC and SFFRM. Despite FISP's open tender system in fertiliser procurement, the government's extensive network access is regarded as strategic in the case of fertiliser shortages as through ADMARC and SFFRM, the government can increase fertiliser availability in rural and hard-to-reach areas (Simtowe, 2015). However, as government networks have been deteriorating, much of their tasks have been taken over by private actors, such as input suppliers and agro-dealers.

In a more recent development, a *de facto* dichotomy has developed of hub- (wholesale) and retail agro-dealers. Hub agro-dealers generate an average turnover of US\$12,000 per year and can facilitate fertiliser warehousing and transportation. Retail agro-dealers, on the other hand, have a turnover of less than US\$5,000 and use the hub agro-dealer as a *de facto* wholesaler. Each hub agro-dealer can serve up to 50 retail agro-dealers with wholesale services. Due to their size and financial means, retail agro-dealers are typically incapable of purchasing fertilisers, which are relatively costly and sold at low margins.

Anecdotal evidence suggests that retail agro-dealers have lower default rates when indebted to their hub-agro-dealer. Fertiliser companies are more willing to invest in a bond of trust with the hub agro-dealers. As such, the hub-retail system could potentially resolve the issue of trust in the fertiliser supply chain in future. Currently, there are about 100 hubs nationwide, predominantly in the central and southern regions of Malawi.

Fertiliser use

Chemical fertiliser use is low among smallholder and poor farmers due to high market prices (Asfaw, Orecchia, Pallante, & Palma, 2018) and low availability, especially in the more rural areas.

According to a 2019 AGRA research paper, fertiliser consumption needs to double if agricultural growth targets are to be met (AGRA, 2019d). In order to promote (sustainable) application, smallholder fertiliser purchase is supported through the FISP programme, which subsidises NPK and urea costs through vouchers that enable reduced price purchases (MK6,000 instead of a market price of MK15,000) (see Box 1 on p18 for an elaboration of the

FISP programme). As a result, more than half of blanket fertiliser sales are carried out under FISP, which highlights the importance of the programme to farmers (and the impact of its randomised distribution on income security), and the incapability of smallholders to continue fertiliser application once they are no longer apart of the programme.

Fertiliser use is highly correlated with farmer income. In a 2018 FAO research paper on soil degradation in Malawi, small-scale farmers are differentiated into poor-, middle- and well-endowed income groups. Outside of the FISP programme, the average fertiliser application rate is 5.6 kg/ha for poor farmers; 25 kg/ha for middle-income farmers; and 67 kg/ha for well-endowed farmers. When enrolled in the FISP programme however, the average fertiliser application rises to 71 kg/ha for poor farmers, 53 kg/ha for middle-income farmers, and 85 kg/ha for well-endowed farmers (Asfaw, Orecchia, Pallante, & Palma, 2018).⁷ It is interesting to note that the average fertiliser application rate of the poorest group outside of the FISP programme is minimal, indicating that the vast majority of this group does not apply any chemical fertiliser.

Besides the dominant blanket fertiliser and urea top dressing, calcium ammonium nitrate, compound D and Super D are common fertilisers. They are specifically suitable for tobacco production, but are occasionally applied to other crops by smallholders. There are no official numbers available on organic fertiliser use in Malawi, but research conducted by KIT in 2016 shows that manure was only applied by 21% of households, and compost by 13% (Audet-Bélanger, Gildemacher, & Hoogendoorn, 2016). Low manure availability of limited decomposition, and high amounts required for sufficient fertilisation were identified as reasons for this. At times, government extension officers have suggested a mix of organic manure and chemical fertiliser following shared positive experiences, but it is expected that no studies have so far been conducted to explore the economic, agronomic and soil-nutrient effects of this practice.

Stakeholders widely agree that fertiliser use management in Malawi is crucial to maintain and improve soil quality for the future. Users should receive some level of education on managing their soil acidity, and nutrient value and requirements. As such, households need to be informed on the contents and state of their soil, and learn about characteristics of a wider variety of crops. Moreover, the input market can be regulated soil-specifically, with the availability of seeds and fertilisers specifically related to local geological circumstances. In both cases, a proactive government is required to help households make the right input decisions.

Currently, extension services are often conducted by fertiliser companies and agro-dealers, leading to a mix of private interest and public advice. As such, the need to improve public educational services towards farming households was voiced during all KIIs.

Quality assurance

Fertiliser demand is highly price driven, meaning that the farmer would almost exclusively go for the least expensive option without appreciation of quality. To prevent the market becoming flooded with cheap and inferior fertiliser, the government attempts to regulate the market by licensing and testing, but only marginally attempts to steer demand by educating and informing farmers. New fertilisers must be registered and approved by the Agricultural Technology Clearing Committee before they can be offered for sale (AGRA, 2019d). If not

⁷ Estimated as an unweighted average over four climate zones

registered in any SADC country, official release must be preceded by three seasons of evaluation.

Interviewed stakeholders formulated their concerns on counterfeit, diluted and expired fertilisers, blaming the lacking control quality capacities of public bodies. There were accounts of fertiliser importations from Mozambique that have been damaged by natural disasters; selling of expired fertiliser and misinformation on available brands under FISP by agro-dealers; and the addition of 'carriers'⁸ by blending companies. As such, each compartment in the fertiliser supply chain is subject to accusations of cheating the farmer, fuelling distrust in an already grid-locked supply chain. Besides deliberate fertiliser adulteration, quality may also be impaired through blending mistakes, insufficient quality checks at importation, precipitation during transport, and poor warehousing facilities.

Quality checks are done by the Malawi Bureau of Standards (MBS), a parastatal organisation established in 1972 by an act of parliament (UNDP, 2012). MBS is responsible for (i) setting and implementing standards; and (ii) conducting conformity tests for produce, import and export. As such, it is responsible for quality checks across the fertiliser supply chain. The critique on the functioning of MBS is two-fold. Firstly, there is insufficient capacity to test conformity in the supply chain, as inspectors are limited in number and there is only one testing facility, located at the MBS head office in Blantyre. Inspections at border posts are given priority to avoid entry of unwanted products into the country. As such, there is insufficient capacity left for tests further down the supply chain. Therefore, little or no post-import sampling and analysis of fertiliser is carried out in Malawi (AFAP, 2016). Secondly, they do not have the legal instruments to order punishments in the case of non-conformity. Currently, the most commonly applied penalty for an offender is seizure of goods. Both problems are addressed in the Fertiliser Bill, which is currently under parliament revision and is expected to pass into act in quarter four of 2020.

Finally, it can be argued that the government also influences fertiliser quality (as well as availability and prices) as a market participant through its two input companies, ADMARC and SFFRFM. According to the government's own accounts, it aims to be a reliable and responsible fertiliser source for farmers in order to encourage competitors to follow suit.

Fertiliser policies and governance

Despite having liberalised the agricultural input programme around 20 years ago, the public sector continues to play an integral role in the fertiliser market through the following: (i) it creates demand through FISP (see Box 1 page 18); (ii) it regulates supply by making fertiliser companies tender for participation in FISP; (iii) it directly participates in the supply side with state agencies ADMARC and SFFRFM, which import and distribute fertilisers; (iv) it approves import requests; (v) holds responsibility for extension services, regulation and control; and (vi) sets the formula of the blanket fertiliser, which is the only available fertiliser for off-the-shelf sales.

Historically, fertiliser policy decisions have been made in an ad hoc manner based on cabinet directives and sometimes motivated by donor requests, rather than through a comprehensive and strategic policy document outlining the future of the sector. This approach is in contrast to other agricultural systems, such as seed, extension and irrigation,

⁸ In the interviews, various stakeholders referred to the addition of 'carriers', which are elements adding volume to the fertiliser but no nutritious value

which have standalone policy strategies. As such, interventions have been fragmented and inconsistent throughout the various government-related institutions that affect the fertiliser system (Simtowe, 2015).

As a consequence, fertiliser production, importation, distribution, trade and marketing are regulated and controlled by different institutions. The mandates of these institutions are organised into different acts, policies and regulations, resulting in overlaps, conflicts and replication in jurisdiction. In the absence of a national fertiliser-specific policy framework to coordinate the efforts of various institutions, the regulatory bodies are inefficient and insufficient (AFAP, 2016). Box 2 provides a comprehensive overview of the roles of the various relevant institutions, as summarised from a 2016 report by the African Fertilizer and Agribusiness Partnership (AFAP).

Box 2. Key institutions in the regulatory framework of the fertiliser system

Public and semi-public organizations

1. MOAIWD has the most comprehensive role in the fertiliser dissemination process, responsible for registration, production, importation, distribution and use of fertilisers.
2. ADMARC is a semi-governmental organisation originally established to enjoy monopoly status for the purchase of a range of controlled crops from smallholder farmers. Since its founding act was repealed in 2003, it uses its vast distribution network in order to supply fertilisers.
3. Like ADMARC, SFFRM is a semi-governmental institution involved in the importation, distribution, wholesaling and retailing of agricultural inputs such as fertilisers.
4. The Ministry of Commerce, Trade and Industry is responsible for specific aspects of the supply chain, such as issuing trade licenses, regulating importation and distribution (including setting and enforcing standards) and management of the port authorities. In certain specified cases, licensing authority is delegated to other organisations in order to ensure a timely response to applicants' needs.
5. The MBS is mandated to ensure fertiliser quality in the market. It carries out pre-inspections and sample testing at importation (despite pre-import analyses performed by importing companies). Further down the supply chain, MBS inspectors visit distributing companies to assess quantities of products held, sample and analyse products, and inform companies if their product is within the range of acceptable nutrient levels. Companies are obligated to facilitate MBS inspectors.
6. Malawi Revenue Authorities are mandated to collect all taxes. There are currently no import taxes on fertilisers (although components for blending may be subject to taxation), yet regular profit taxes of 30% are applied.
7. The Agricultural Technology Clearing Committee tests agricultural input products under local conditions, and is mandated to allow a product access to the Malawian market if it is scientifically proven to viably increase productivity.

Interest groups

8. The Fertilizer Trade Association was formed in 2007 in order to represent fertiliser companies in a public-private partnership to execute FISP. Most fertiliser companies are members of the Association, which is a prerequisite to being eligible to participate in FISP. The Association provides the government with policy advice, information on the status of fertiliser supply in the domestic market, and controls quality checks among its members.
9. FUM is an NGO that represents the interests of smallholder farmers to government.

Legally, the availability of fertiliser in Malawi is predominantly regulated by the Fertilizer, Farm Feeds and Remedies Act, which has been in place since 1970 with latest adaptations dating back to 1996. Since then, there have been efforts to modernise the legislative framework but with little success. In 2003, a Fertilizer Bill to govern the registration of fertilisers and regulate imports, manufacture, distribution and sale was drafted. It was not debated in parliament because law makers required that a national fertiliser policy would first be put in place to guide the legislative process.

The national fertiliser policy was initiated in 2015 and is now awaiting submission to the Office of the President and Cabinet for approval. This will enable the Fertilizer Bill to be debated in parliament. The Bill will include standards for organic fertilisers, bio stimulants and blends. Stimulating and supporting the legislative process to enable the enactment and approval of the Fertiliser Bill – and policy – has been one of the major impacts of AGRA's intervention in Malawi.

Anticipating an official fertiliser policy, the Government of Malawi issued a National Fertilizer Strategy in 2007 which serves as input for further policy development. The following analysis of the strategy is adopted in full from a 2016 AFAP report:

The purpose of the National Fertilizer Strategy is to address key issues affecting the adoption and utilization of fertiliser technologies through short, medium, and long-term actions for developing private sector-led fertiliser markets, with a view to improve agricultural productivity and profitability, especially among smallholder farmers. The strategy also identifies priority actions that are likely to accelerate farmers' access to affordable fertiliser and incentivize its use. Considering that Malawi is a net importer of fertiliser, the strategy also serves as an input into the development of a Regional Fertilizer Action Plan to accelerate access to fertiliser and other complementary inputs to millions of poor farmers (MoAFS). The Fertilizer Strategy identified the following strategic issues affecting fertiliser markets in Malawi as: (1) the availability of fertiliser in terms of timeliness of importation and distribution, addressing also the issue of the country's installed capacity to produce blended fertiliser, potentially using available natural resource deposits; (2) the high cost of fertiliser due to poor transportation infrastructure, equipment and rural feeder roads; (3) fertiliser accessibility with respect to distance to markets and price (both of which are closely related to transport issues) and farmers' purchasing power to buy fertiliser; (4) fertiliser utilization related to the proper type of fertiliser according to specific crops and soil/environmental conditions; and (5) new research and extension and the establishment and enforcement of a legal framework.

As such, the strategy addresses many of the fertiliser supply chain inefficiencies voiced in this report. Specifically, it connects to the other major efforts by AGRA in the fertiliser system, and replaces the blanket fertiliser with ASFs. As previously mentioned, the blanket fertiliser is currently the only formula permitted to be sold off-the-shelf, which disables the opportunity to respond to divergent or changing soil needs, or nutrient requirements of different crops. Moreover, the addition of zinc and the high amount of phosphorus to the fertiliser make it unnecessarily costly for many soil types. Application of the blanket fertiliser may also, in some cases, result in more rapid soil acidification.

Stakeholder interviews brought forward two more key dissatisfactions with the regulatory framework that are less central in the current fertiliser strategy. Firstly, the most common concern about the role of government is its insufficient capability to ensure that fertiliser sold in Malawi complies with MBS requirements. Much is expected from the Fertiliser Bill, which plans to set penalties on trespassing of regulations and to make provisions for the creation of institutions fully mandated to enforce the law and regulations governing the fertiliser sector (Simtowe, 2015).

Secondly, some stakeholders voiced criticism on the current set up of FISP. On the supply side, the requirement to keep a real-time account of sales through the programme creates an administrative burden, and unexpected cost of participation. On the demand side, there is a debate about whether the right farmers are selected to benefit from the programme. In principle, FISP has a progressive nature, in which low-income farmers have a higher chance of being selected to access quality inputs. However, fertiliser adoption and continuation rates remain low as the poor farmers are not able to continue to purchase fertilisers outside of the programme. Further, due to the nature of the selection process, there are numerous concerns about the actual ability to target the most poor and vulnerable households. Village heads, in collaboration with village development committees, identify beneficiary households within their jurisdictions, leaving room for abuse of power, rent seeking and influence by local politics (Simtowe, 2015). Typically during the KIIs, it was claimed that the subsidy is often awarded to the same households over the years, and that estate farmers are unofficially also allowed to participate. However, FISP is highly politicised and no major changes to the programme are foreseen for the near future.

5.2 AGRA change ambitions

AGRA's point of departure

In the first 10 years (2006-2016) AGRA's work in Malawi did not specifically address fertiliser use or systems (AGRA, 2019b). However, it worked on soil health which is closely related to the fertiliser system, as increased use of inorganic fertilisers contributes to soil quality maintenance. Central to AGRA's soil health strategy was integrated soil fertility management (ISFM), which focuses on the combined use of inorganic fertilisers, soil amendments (e.g. rock phosphate, lime, etc.) and organic matter (e.g. crop residues, legumes, manure, etc.) to replenish lost soil nutrients (Asfaw, Orecchia, Pallante, & Palma, 2018). Within the mentioned timeframe, AGRA celebrated the following achievements (AGRA Malawi, 2019):

- 4,311 agro-dealers trained in ISFM. They sold 18,632 MT inorganic fertiliser;
- 2,241 lead farmers and 894 extension agents trained in ISFM;
- Six lab technicians trained in plant and soil analysis;
- 795 farmer organisations trained in ISFM, and 44,891 farmers trained in post-harvest handling, quality, storage and structured trading;

- 12 MScs funded in soil science;
- 71,000 farmers using ISFM technologies and 53,466 ha cropped with ISFM technologies.

According to a 2018 FAO study, ISFM is the best fitted strategy for Malawi to maintain and improve soil quality. Key to making ISFM success, the study continues, efforts should be blended with “awareness raising, technology transfer, and farmer trainings, supported by adequate extension services” (Asfaw, Orecchia, Pallante, & Palma, 2018). AGRA’s subsequent activities have closely resembled this advice.

Change ambitions

In order to develop a change strategy for the Malawi fertiliser sector, AGRA has identified the gaps and opportunities in the fertiliser system as summarised in Table 10.

Table 10: Gaps and opportunities in the current fertiliser system

	Status	Gaps and opportunities
Soil mapping and testing	With support from IFAD, AGRA and the Multi-donor Trust Fund through ASWAP, government collected soil samples from all districts Soil analysis was completed for macro elements and maps were developed	Finalise testing and analysis of micro-elements
Product development	Fertiliser recommendations were developed from the nutrient deficient soil maps With programme support, the private sector developed five fertiliser formulations which are currently under trial	Conduct validation trials of developed recommendations Support development of fertiliser formulations
Retail and distribution	There are about 2,000 agro-dealers and 12 hub agro-dealers developed by AFAP Most of them lack capacity to stock adequate inputs due to lack of working capital There is also limited trust in agro-dealers by suppliers, such as seed companies/fertiliser companies/chemical companies due to default when given the stock on credit AGRA has invested some resources in RUMARK and AFAP but these are concentrated in selected districts	Agro-dealers can serve as aggregators but also advisory service providers to farmers that patronise their shops AGRA to work with and strengthen RUMARK and AFAP capacities to support agro-dealers
Awareness by famers	AGRA, together with other DPs, is raising awareness among farmers about agricultural products through different media houses	Raise awareness of new fertiliser products and counterfeit products Strengthen extension system
Regulation	The fertiliser subsector is regulated by the Ministry of Agriculture under the 1996 Fertilizer and Farm Feeds Act	Enact Seed Bill and develop seed regulations Transform SSU into National Seed Commission

The 2019 Fertiliser Policy has been developed and is currently awaiting approval by Cabinet

Source: summarised from AGRA Malawi's operational plan, 2019b

Currently, AGRA's change ambition for the fertiliser system is three-fold, as outlined in their operational plan:

1. Support to develop “fertiliser blending and formulations tailored to specific soils and locations for Malawi” (AGRA Malawi, 2019e);
2. Enhance state capacity and policy, specifically by supporting the development of a fertiliser policy and act;
3. Strengthen the agro-dealer network in order to bring both fertilisers and extension services close to the farmer.

1. Development and implementation of ASFs.

The current blanket fertiliser formulation has various disadvantages: it is not specific to local soil quality and degradation, it is not specific to crop requirements, and it can be unnecessarily expensive. AGRA seeks to support the development of ASF recommendations, and has made the following investments:

- Testing of soil samples and formulating area-specific formulas. The soil samples were initially taken in 2014 and AGRA supported the costs of analysis and subsequent fertiliser recommendation formulations by AFAP;
- Supporting the development of a new policy framework regarding fertilisers. The introduction of ASFs is championed by FUM and supervised by the Department of Land Resource Conservation. AGRA has granted support to cover organisational costs;
- Informing farmers on new blanket fertiliser and new ASFs through various communication outlets. In order to inform farmers on upcoming new ASFs, AGRA supported The Story Workshop Educational Trust (SWET), an initiative to reach out to communities through various media outlets.

2. Support the development of a fertiliser policy and act

AGRA has played a central role in supporting MOAIWD in the recent development of the fertiliser bill, which has been in draft since in 2007 (AFAP, 2016). Since then, the Bill has been subject to legislative wrangling by politicians, but is expected to be passed into legislation in 2020. The Bill addresses the issue of quality control checks and the enforcement of fertiliser standards and legislation, and is thus expected to address quality and trust issues throughout the supply chain. Now, AGRA supports FUM, the lobbying platform of smallholder farmers, to integrate farmers' needs into the policy-making process and inform their members on new legislation. A summary of the key components of the Fertiliser Bill is provided in Box 3.

Table 11: Expected benefits from new Fertilizer Act

Legislative changes	Expected benefits
The creation of an independent body, the Malawi Fertilizer Regulatory Service (MFRS)	Currently, there is no central body coordinating the efforts of the various (semi-) governmental institutions operating in the fertiliser supply chain, resulting in overlapping jurisdictions and contradicting

requirements. The MFRS will centrally synchronise the different institutions

The creation of the Malawi Fertilizer Advisory Committee	The institution will hold an advisory role to the MFRS and make recommendations on all technical matters pertaining to the regulations including, but not limited to, programme inspection and enforcement and additional or revised regulations required to accomplish objectives of the Act.
The establishment of a Malawi Fertilizer Regulatory Board (MFRB)	The Board shall appoint public service inspectors and analyst who will carry out functions such as: inspection of premises for fertiliser storage, registrations and the labelling of fertiliser, and sampling and analysis of fertiliser throughout the supply chain. Sampling and testing will be done by qualified inspectors.
The requirement to pay inspection fees directly to the MFRB	The MFRB will be able to be financially independent from the government by being able to collect its own inspection fees. As such, it is less prone to austerity measures by the government and/or efforts to apply political pressure. The inspection rate per tonne fertiliser will be determined by the Minister.
Required registration and certification of fertiliser importers	Registration and certification of importing companies will provide for improved control over fertiliser imports.
Required registration and certification of fertiliser dealers	Registration and certification of agro-dealers will provide for improved control over retail sales.

Source: AFAP, 2016. Note: list of legislative changes and benefits not complete.

3. Strengthen the network of agro-dealers

AGRA aims to address certain soil-related challenges through strengthening the network of agro-dealers by financially supporting their umbrella membership organisation, RUMARK. In part, the grant aims to enable agro-dealers to provide extension services on the use of improved inputs through technology demonstrations, for example. More importantly, the grant is used to assist agro-dealers in establishing viable businesses by training them in business management and good agricultural practices (GAPS), for instance. Moreover, they link agro-dealers to input suppliers, aiming to break the gridlock in the fertiliser supply system, resulting from the high degree of mistrust between agro-dealers and input suppliers. For the same reason, RUMARK will further expand the hub-retail system, which has shown to be a promising model to get fertilisers to agro-dealers. Ultimately, AGRA's ambition to strengthen agro-dealer capacity should provide smallholder farmers with easy access to improved production inputs.

Table 12 maps the various grants that are outstanding to various components of the supply chain.

Table 12: AGRA PIATA grants mapped to input system components

Input supply system components	Envisioned change	AGRA investments	Timing	Intervention	Implementing partners
Importation					
Local blending	Move from blanket fertiliser	185,254	1-12-2018 – 30-11-2020	<ul style="list-style-type: none"> Organise the initial 	AFAP

	to area-specific blending				production of ASF
Distribution	To strengthen the capacity of hub and rural agro-dealers to improve delivery of seeds, fertilisers and extension services to smallholder farmers	135,207	08-2018 – 06-2020	<ul style="list-style-type: none"> • Technology demonstrations • Training in business management and GAPS • Link supply chain 	RUMARK ⁹
Fertiliser use	Move from blanket fertiliser to area-specific blending	129,223.00	1-12-2018 – 30-11-2020	<ul style="list-style-type: none"> • Inform farmers on new blanket fertiliser and ASF through various communication outlets 	SWET
Quality control	Strengthen legislation and institutions through Fertiliser Bill		09-2018 – 05-2020	<ul style="list-style-type: none"> • Public-private dialogue forums on Fertiliser Policy held • One media engagement and outreach event conducted 	FUM
Policies and governance	To improve the business environment for agribusiness firms and farmers through reforming legal frameworks in Malawi	240,998	10-2018 – 05-2020	<ul style="list-style-type: none"> • Finance process of development fertiliser policy and bill 	Department of Agriculture, Planning and Services
	Strengthen legislation and institutions through Fertiliser Bill	235,369	09-2018 – 05-2020	<ul style="list-style-type: none"> • Public-private dialogue forums on fertiliser policy held • One media engagement and outreach event conducted 	FUM
	Move from blanket fertiliser to area-specific blending	335,041	1-12-2018 – 30-11-2020	<ul style="list-style-type: none"> • Testing of soil samples • Formulating area-specific formulas 	The Department of Land Resource Conservation

⁹ Grant falls officially under seed systems, but has fertiliser system components and is thus integrated in the overview

- Execute demo trials
- Train frontline staff in fertiliser blend demonstrations

5.3 AGRA systems change results

At the time of writing, AGRA had awarded a total of five grants supporting the fertiliser system in the context of PIATA. As per Table 12, those grants have been awarded to (i) the Department of Land Resource Conservation; (ii) AFAP; and (iii) SWET, in order to support the introduction of ASFs; (iv) and to the Department of Agriculture Planning Services to support the legislative process of the fertiliser policy and bill; and (v) the FUM in order to strengthen legislation and institutions through the Fertiliser Bill.

The first four are currently only around half way into their two year period whereas the latter grant came to an end recently (see Table 12). A midterm review of the ongoing interventions will be carried out, as well as a results analysis, at a later time.

The below section addresses the progress of the different programmes, and analyses their (expected) impact on the relevant fertiliser system compartment. Note that one programme may (sometimes unintentionally) affect multiple compartments. As such, programmes may be addressed multiple times. Moreover, the programme aiming to develop and introduce ASF is led by a consortium of three grantees. The separate inventions of these grantees have been differentiated and are discussed at the compartment of the system where their potential impacts occur.

Importation

The Fertiliser Bill that AGRA supports through grants to its champions, FUM and the Department of Agricultural Planning and Resources (DAPR), could give a significant boost to the importing industry. Currently, fertiliser importers face many administrative costs due to overregulation (such as a minimum of three years of testing when introducing a new blend, even if the fertiliser has been tested in another country), or conflicting and overlapping jurisdiction of governing bodies. The Fertiliser Bill can address these issues to reduce the costs of introducing and importing fertilisers in the future. The Fertiliser Bill is further discussed under the 'Policies and governance' heading.

Local blending

Project with AFAP

In order to facilitate the development of ASF, AGRA has awarded a grant of US\$185,254 to engage fertiliser companies and organise the blending process of ASF. AFAP is part of a consortium with SWET and the Department of Land Resource Conservation (DLRC). The former is responsible for extension services to farmers (see header: 'Fertiliser use'), the latter for development and testing of the fertiliser formulae (see header: 'Policies and governance').

In the first phase of the project, AFAP will have six fertiliser blends¹⁰ developed, targeting 16,000 MT of sales by local fertiliser producers. In the second phase, they will organise six

¹⁰ This number may change depending on new insights

training events to build farmer capacity, and train 600-agro dealers on promoting the new fertiliser blends.

AFAP has currently identified two blending companies that are willing to produce the ASF for sampling. At the time of our interview, AFAP was not willing to say if these were the two local blenders or if they also considered foreign offers. As both local blending companies are members of FAM, and are willing to accept the terms and conditions of the tender (most importantly, production has to be done free of charge), AFAP has engaged FAM in the selection procedure. As the providing company may have a first mover's advantage in knowledge of the product, technology and reputation, selection should be carefully considered to ensure a fair and transparent process.

AFAP has formed a national task force, which aims to ensure that all key private companies are involved in the development process. It has been agreed that each private company will contribute towards validation of the developed fertiliser formulation. As it stands now, the ASF will first be produced on a small scale by one or two companies. This will facilitate a testing phase in which the ASF will be used alongside the blanket fertiliser.

Retailing and distribution

The most striking result of mistrust within the fertiliser supply chain is that agro-dealers are currently almost completely excluded from the fertiliser supply chain, even though they are best equipped to make fertiliser available to the farmers. In order to reinstall trust into the network, which may eventually lead to supply on credit for agro-dealers, AGRA is supporting RUMARK in developing the hub-retail agro-dealer network.

Project with RUMARK

In order to facilitate further development of the hub-retail model of agro-dealers, AGRA extended a US\$135,207 grant to RUMARK. While this is officially not marked as support to the fertiliser system, it will definitely benefit this supply chain. As part of the programme, participating agro-dealers are also trained in business practices and GAPs.

Fertiliser use

There are currently two outstanding grants that aim to promote and guide fertiliser use. The project with RUMARK (albeit not marked as a fertiliser system grant) supports the organisation in its efforts to set up fertiliser demonstration plots (see 'Retailing and distribution' heading). The other project is with SWET (see below).

Project with SWET

AGRA aims to support both "increased knowledge of fertiliser blends" and "increased use of fertiliser blends" (AGRA Malawi, 2019) through its US\$129,233 grant to SWET. SWET is the second partner in the consortium currently preparing to introduce ASF. SWET educates smallholder farmers on the benefits and use of fertiliser through different channels. Its commitment for the two year period is to produce: (i) 5,000 information, education and communication (IEC) materials (leaflets and posters); (ii) six video documentaries; (iii) 30 radio magazines; and (iv) conduct 8 road shows. They are working together with two other grantees (i.e. AFAP, DLRC) who are responsible for the development and introduction of ASF. As such, they will also inform the public on transition from the blanket fertiliser to ASF, which, according to the DLRC, will possibly be introduced before the start of the next (2020) planting season. As part of their message, SWET appeals to farmers to have their soil tested and receive a soil-specific fertiliser recommendation.

SWET has produced the material for the radio magazines and the IEC materials, and has organised five road shows. Additionally, they have recorded six radio commercials and organised four community dialogs. In total, they have visited nine out of the 11 districts in the scope of their programme. One community dialogue can reach 200 households and a single road show up to 6,000. At the time of the field work for this study in November 2019, they estimated to have reached 25,000 households out of a target of 76,000 for 2019. This target is expected to be met due to events planned between the time of our visit and the end of the year¹¹. For 2020, the target is set at another 25,000 households, which will be targeted through two more community dialogues that were initially outside the scope of their project.

There is little doubt that moving from the blanket fertiliser to ASF can yield positive returns for farmers, both in short and long term, yet the degree greatly depends on the mismatch between the current blanket fertiliser and the soil needs. At the time of our research, tests regarding improved crop yields were still being conducted, and our interviewees could not be tempted to speculate.

There are various aspects of soil quality influencing crop yield. Soil pH is one of the major factors affecting nutrient availability and mobilisation in the soil for nitrogen (N), phosphorus (P) and sulphur. Research studies on maize production have shown that the critical pH value is 5.2 for most soils in the country. In 2010, soil in three out of the 13 districts had average pH values below this threshold, and all districts saw their pH values rapidly declining. Regarding the three key nutrients of inorganic fertiliser, the critical values are observed as follows: N > 0.1%; extractable P - 15 mg/kg; and exchangeable potassium (K⁺) - 0.2 cmol/kg. Similar limits can be set for nutrients such as calcium (Ca²⁺), and magnesium (Mg²⁺) – which are both positively correlated with pH levels – zinc (Zn²⁺) and soil organic carbon (Asfaw, Orecchia, Pallante, & Palma, 2018).

Figure 4 shows the spatial distribution of nutrient levels across Malawi, as calculated by the FAO (2018). From the figure, it can be seen that exchangeable K is not a significant soil problem in Malawian topsoil, as only the Machina, Thyolo and Zomba regions show levels that fall below the critical value. However, for available organic P and total N, deficiencies in availability can be seen in certain parts of the country. When nutrient availability is below its critical value, raising the specific value will directly result in increased crop yields for farmers.

Relevant to notice is that soil nutritional deficits are not proportionally distributed across districts, i.e. one district can have a large deficit in one nutrient and not in the other. Thus, applying more of the same blanket fertiliser until the nutrient in deficit reaches the critical level will result in the ‘waste’ of other nutrients in the blend. ASFs may solve this problem by optimising the crop yield/fertiliser application equation for farmers.¹²

The discussed nutrients critical values apply to maize. Different sorts of crops will have different critical values, and the Department of Agricultural Planning and Resources has already indicated that the next step would be to develop recommendations for crop-specific fertilisers as well.

¹¹ The estimated reach does not include audience of their radio commercials and magazines but only that of road shows and community dialogues. Lacking measurement tools, they rely on footage of the events to make estimations of the outreach

¹² The required and forecasted amount of nutrients is further determined by pH levels in the soil, which are also unevenly distributed across the country. Fertilisers can also address soil acidity, for example, by adding lime to the formula. Annex 2 gives an overview of pH and nutrient levels for the different districts

Besides varying nutrient levels, Malawi also faces varying depletion rates per region. As such, area-specific recommended application rates (kg/ha) should also be determined to address depletion rates. It is believed by the authors of this report that addressing soil depletion is currently not part of the fertiliser development programme. Considering AGRA's efforts in the past to maintain soil quality through investing heavily in ISFM programmes, this is a missed opportunity.

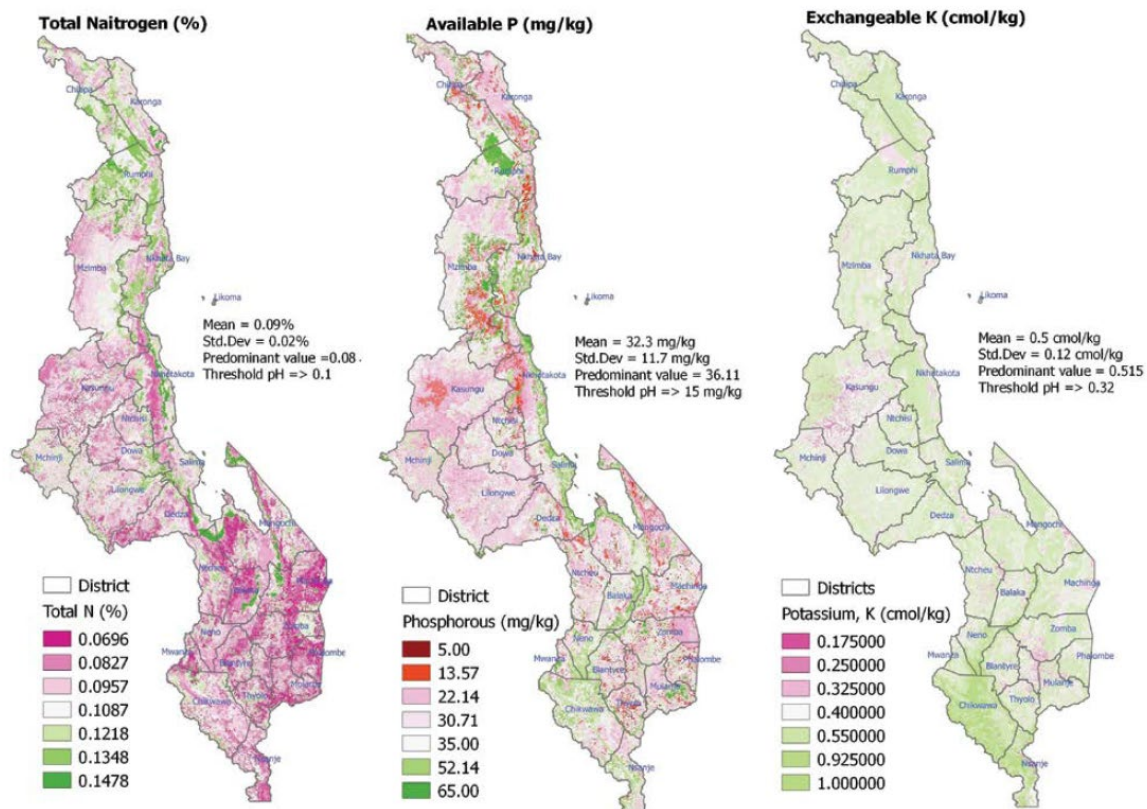


Figure 4: Spatial distribution of NPK topsoil nutrient indicators in 2017

Source: FAO, 2018

Quality control

AGRA attempts to improve quality control through its active support to the Fertiliser Bill, which intends to establish an independent parastatal organisation equipped to maintain rules and regulations and impose penalties (see 'Policies and governance' header and Table 11). Across the board in the supply chain, stakeholders await the enactment of the Bill and support the expected content. In the current situation, where there is a risk to the farmer in buying poor quality fertiliser, there is also great damage done to trust in the supply chain. Farmer organisations and fertiliser companies blame the agro-dealers; importers blame the fertiliser blenders, the and blenders point at the importers.

Policies and governance

AGRA currently has three outstanding grants to support fertiliser policy development and improve governance. This section briefly describes each one.

Project with DLRC

DLRC is the third grantee in the consortium for the development and implementation of ASF in 11 out of 39 national geographical areas. They have been awarded a grant of US\$335.041

to collect and analyse 1,000 soil samples, develop a national soil nutrient map, and technically support a national soil science lab at DARS.

DLRC has done the initial soil analyses and produced the maps, and has made the recommendations on fertiliser blends. Currently, AFAP is in the process of having the fertilisers produced, and SWET is informing farmers in the relevant areas on the upcoming changes. In the meantime, the fertilisers are being tested on 27 plots in the 11 districts, where DLRC continues to take samples during the trials to see how the soil reacts. Furthermore, DLRC will compare the results after harvest in a randomised control trial. In the coming period, DLRC will continue to refine the soil maps based on the newly acquired data. They are also already scaling the ASF R&D to the 28 other geographical areas, where they are implementing the same programme with NASFAM funding. If further development and testing is successful, DLRC expects that the blanket fertiliser will be updated to the ASF by the start of the 2020-2021 planting season.

Project with DAPR

AGRA supports DAPR with a grant of US\$240,998 to facilitate reforms in the fertiliser subsector (i.e. to support the development of a new fertiliser policy and bill). Just like the Seed Bill, the Fertilizer Bill will address issues of fertiliser certification, penalties, release of formulations and regional harmonisation.

Project with FUM

AGRA has provided FUM with a grant of US\$235,369 to lobby for farmer interests in the development of the new fertiliser policy and bill. FUM is an umbrella body of all farmer organisations, and aims to integrate farmers' perspectives into policy making. The grant is also meant to support FUM's efforts in other agricultural areas, such as the seed and extension system. Regarding the fertiliser system, FUM have been pushing for approval of the new Fertiliser Bill, in which FUM expects farmers' interests will be better protected as it refers to the establishment of a strong and capable regulatory body to uphold fertiliser quality rules and regulations. As mentioned previously, the Bill is currently with the Office of the President and Cabinet for approval.

5.4 Analysis of AGRA results

AGRA in the intervention landscape

Various recent projects in Malawi's fertiliser sector have received support through development funds. The vast majority of the projects revolve around soil health and capacity building, which are also themes AGRA addresses through funding to AFAP, DLRC, RUMARK and SWET.

Examples of other interventions in the fertiliser landscape:

- The World Bank (2010-2018) supported the testing and mapping of soil types, leading a multi-donor initiative including IFAD, Norwegian Agency for Development Cooperation (NORAD) and USAID;
- USAID (2015-2017) financed development of a laboratory at the MFC for soil testing;
- The European Union and IFAD (2015) funded Farmers World and the MFC to carry out soil testing for the development of custom blends;
- NASFAM currently supports the testing of ASF in 28 districts;

- Cultivating New Frontiers in Agriculture and Rockefeller (2002-2009) funded RUMARK to provide capacity building to agro-dealers;
- NORAD (2018-2022) funds the African Institute for Corporate Citizenship to deliver capacity building to agro-dealers;
- The World Bank currently trains 200 frontline extension workers at diploma level to reduce the vacancy rate at the Ministry of Agriculture.

It seems that AGRA projects regarding ASF development have been largely complementary to other interventions already in place, each addressing different stages of development or regions of the country. In 2018, the World Bank stepped back as the main funder of the ASF project when the soil sampling was done, and AGRA stepped in for the testing phase. AGRA tests the ASF in 11 districts, whereas the DLRC gets support from NASFAM to test in the remaining 28 districts.

Regarding the capacity building of agro-dealers, this is less clear. AGRA started funding RUMARK to provide capacity building when CNFA and Rockefeller stepped back in 2009. The extension worker-to-farmer ratio is currently estimated at around 1:3,000. As such, there are sufficient opportunities for multiple parties to engage in agro-dealer capacity building. However, during stakeholder interviews, it was also mentioned that some agro-dealers have been trained multiple times by different organisations in the last few years. As most organisations work regionally, the regions of intervention should be carefully selected to avoid duplication.

Relevance

AGRA's overall aim of increasing farmers' income and food security by focusing on the fertiliser system has been well selected. Fertiliser is often unavailable to smallholders and quality concerns are such that farmers refrain from make the substantial investment required.

Addressing soil needs

Soil quality is poor and decreasing in many areas in Malawi, making inorganic fertiliser an essential component to contribute to current and future yield increases. Moreover, soil needs differ per area, thus AGRA's support to move away from the blanket fertiliser may increase affordability and efficiency of fertiliser use. As ASF has the benefit of presumably being less costly in many cases, the foreseen shift may even increase demand. As such, ASF may address the pressing soil nutritional deficits, now and in the future.

However, properly addressing soil needs requires more than merely the right blend of fertiliser. Guiding smallholder farmers in best practices regarding application rates and methods is similarly important. Soil fertility can further be maintained by intercropping and applying the right planting methods. Previously, AGRA advocated for an integrated approach promoting ISFM, a strategy described as the best soil management solution for Malawi by the FAO. AGRA should therefore attempt to avoid focusing on merely one soil management tool under the PIATA programme. AGRA can potentially instigate a study looking into the benefits of combining organic manure and chemical fertiliser, a practice promoted by extension officers in the Lilongwe region.

Smartly aligning investments

AGRA cleverly manages to leverage political will and to strategically engage in partnerships to accomplish results above its spending power. One example concerns its ability to create

new momentum for the Fertiliser Bill, which had long been stalled and is now expected to be passed in 2020. Not only will the Bill affect the entire system, with positive expectations throughout, but AGRA simultaneously funded FUM in order to increase its efforts to have farmers' perspectives considered in the Bill's development.

Another example of AGRA's clever investments concerns its support to the hub-retail agro-dealer model, in which building alliances of trust has substituted for a fully-functioning legal and financing system. Lastly, its funding in the development of ASF builds on soil sampling efforts financed by the World Bank. AGRA now manages to finance the development phase that will lead to concrete results.

Reinstalling trust

The lack of trust among actors of the supply chain is currently one of the most striking features. AGRA addresses the mistrust of farmers regarding fertiliser quality through its support to the Fertiliser Bill, which will improve quality inspection and provide opportunities to penalise offenders. In addition, through its support to the hub-retail model, AGRA is shortening the linkages of the supply chain, allowing the opportunity for trust to grow among actors.

Focus on financing

AGRA currently does not support any project aiming to inject liquidity into the supply chain. Businesses in the agricultural sector face high interest rates from local banks and have no access to international financing, resulting in lacking investments and an unlevel playing field with regard to foreign and internationally operating companies. This market inefficiency could potentially restrict fertiliser companies to set up local production facilities (see the 'Impact' header). Similar financing restrictions are present at the demand side, where smallholder farmers often have no access to credit. In order to drive fertiliser demand, AGRA could further look into options to support projects that provide investment capital to smallholders.

Sustainability

AGRA's current projects have a high chance of establishing long-term impact, as they have a clear end point, after which a new and durable situation is created. For example, the end point of the ASF project will come when the government officially replaces the current blanker fertiliser for ASF, after which it will become the new standard. Similarly, AGRA's support to the Fertiliser Bill concludes at the point of adoption, after which it is the task of the government to uphold the new rules and regulations.

AGRA is already preparing farmers for the upcoming changes. It supports SWET in its efforts to disseminate information on ASF, whilst providing support to FUM to inform their backers on the introduction of the Fertiliser Bill.

One project that does need conscientious follow up is the development of the hub-retail model through AGRA's project with RUMARK. Although early signs are promising, the lack of a mature legal system to invoke liability issues remains problematic. Trust within the supply chain will only continue to grow until it is abused, at which point the agro-dealers and input suppliers are back to square one.

Impact

AGRA's investments in the fertiliser system are largely half way through their projected timeline, and thus, this report refrains from evaluating the current situation. However, it will

reflect on some potential impacts on the fertiliser system that seem pressing to account for at this time, mainly resulting from the introduction of ASF.

Local blending

Of the interviewees, most stakeholders agreed that the introduction of ASF could favour local blenders with regard to importing companies. Importers face fixed batch costs, which are expected to increase when multiple, small-sized batches of various blends need to be imported, rather than a single blanket fertiliser.¹³ Contrary to importing companies, local blenders are expected to face no price increases due to the increase in fertiliser varieties. Local blenders are thought to have smaller batch costs than importers, as costs for resetting the ingredient proportions on the machine for the new batches are thought to be negligible.¹⁴ As such, diversifying to multiple smaller batches will have a lesser effect on prices for local producers than for importers.

As a result, the market share of local blending companies is expected to rise and other blending facilities might open up, given the right circumstances. As previously mentioned, the local blenders currently face a situation of over-capacity, so the cost increase by importers can at least partly be absorbed by increase in production by the local blenders.

Currently, the most important bottleneck constraining fertiliser companies from local blending are the initial investments costs. Private companies in the agricultural sector borrow against interest rates above 20%, and are offered repayment periods as low as five years. During the KIIs, importing companies showed an interest to move towards local blending if they will be consistently undercut in prices by local producers. Due to the price-driven behaviour of consumers, the potential alternative is a *de facto* duopoly on the fertiliser market by the two local blenders. Potentially, AGRA could play a role in the organisation of finance structures for the development of local production plants in the future.¹⁵

The local blenders can expect to experience an additional benefit from AGRA's efforts to ensure the fertiliser policy is adopted. Under current legislation, fertiliser imports are exempt from import duties. However, micronutrients, such as zinc, are taxed with 25% import duty and 16.5% VAT. If fertiliser inputs will be taxed as regular agricultural inputs under the Fertiliser Bill, local blenders can expect decreasing production costs.

Availability and prices

The grants promoting ASF may negatively impact the availability of inorganic fertiliser through higher volatility in supply as a result of the smaller market (i.e. as larger markets spread the risk of supply shocks). This becomes especially problematic when markets become too small for multiple suppliers, or when fertiliser companies divide the market geographically, allowing them to specialise but at the same time, increasing the dependency of farmers on one supplier. However, the new Fertiliser Bill may decrease the time required for products awaiting import to gain licensing, which is said to lead to shortages in the current system.

For price development, similar counterforces are expected. On the one hand, removal of red tape by the Fertiliser Bill may increase efficiency of the supply chain and thus lower

¹³ Yet, the degree of cost increase is debated and one importer stated that the administrative hassle would increase, but without price effect

¹⁴ There are even no cleaning costs in between blending of different formulas

¹⁵ As discussed with AGRA staff on 22-11

consumer prices. Moreover, in many regions there can be a reduced amount of zinc and/or P added to the ASFs, which could lead to significant price decreases. On the other hand, increasing import prices are expected (see 'Importation') due to batch costs, potentially resulting in duopoly price setting by the local blenders.

When asked about the potential price effects of ASF on retail prices, the DLRC voiced that it is currently expecting fertiliser costs to drop, on average, because of the lower content of zinc and P. However, before introduction of the ASFs, an economic analysis will be conducted by the Department of Economic Planning. Price increases might be acceptable in specific areas, but only if they are justified by sufficient increase in expected yield.

Another potential risk is that the number of retailed fertiliser varieties will increase per district (ASF is likely to cross area borders and crop-specific fertilisers will in time be available in the same outlets). If education and extension services don't follow suit, the farmer might very well be worse off (already, tobacco fertiliser is often used by small-scale maize farmers).

Economic impact studies

AGRA has expressed three main ambitions: (i) to make policy more efficient; (ii) increase fertiliser availability at a low cost and close to the farmers; and (iii) support farmers to use more fertiliser. As cost and availability are at the core of AGRA's ambitions, it would be advisable to conduct further economic impact studies on the effect of AGRA programmes on aforementioned issues.

How to measure success

Lastly, the difficulty to formulate adequate key performance indicators for AGRA Malawi's projects is addressed. These difficulties arise as a result of AGRA's laudable and efficient strategies to engage in strategic partnerships and leverage political momentum. As AGRA chooses to play a directive force in the background, allowing other parties to accomplish success, measuring AGRA's direct contribution to these accomplishments is inherently difficult. A prime example of this is its efforts to guide the Fertiliser Bill through the legislative process. This project is expected to have a highly positive impact on the fertiliser system. However, with the involvement of so many stakeholders, it is not a question of whether AGRA has supported the outcome, but if the Bill would have been passed regardless of AGRA's investments.

PART II: SME survey

6 SME performance

6.1 Introduction

AGRA considers SMEs as important drivers of growth. They account for up to 90% of all businesses in sub-Saharan African markets. In many agricultural commodity value chains SMEs also take up many of the downstream activities of processing, storage, transportation, wholesale and retail that are necessary to send farmers' produce to the end market.

An important PIATA programme pathway of change is supporting the development of SMEs operating in, and providing support services to, agricultural value chains. AGRA works to stimulate both demand and supply sides of technical assistance and financial products for SMEs. Core interventions focus on:

- Identifying high-potential SMEs and supporting them with business and technical advisory services to scale up operations. These advisory services involve a performance-based model, which requires them to produce business plans and achieve results through effective support to SMEs;
- Matching grants for emerging medium-sized aggregation/storage businesses in under-served areas where smallholder farmers are increasing their yields, and marketing greater surpluses;
- Providing access to working capital finance for SMEs;
- Influencing the ecosystem within which SMEs operate by supporting the development of business, enabling goods and services such as packaging, commodity handling and processing machinery, as well as payment processing services and market data.

To assess the changes in performance of SMEs benefitting from the AGRA-PIATA programme, a rapid survey instrument has been designed, and the baseline data collected is reported on here.

In the design of the monitoring tool, the following needs were taken into consideration:

- A rapid and affordable tool to monitor SME performance;
- A tool which can be tailored to different SMEs, but still allow comparison and use across very different types SMEs;
- A tool which can be used for very different sized SMEs, including micro enterprises;
- A tool which can monitor SME performance change over time;
- A tool which can offer an immediate overview of SME performance;
- A tool which is simple, openly accessible, and can be implemented across countries by enumerators with a reasonable level of education.

To meet the above demands, KIT has developed a simple SME performance scorecard.

6.2 Methodology

Performance dimensions

The scorecard for SME performance is based on monitoring four dimensions of performance:

- **Business resilience:** indicates the ability of the SME to adapt to disruptions while maintaining business operations, employment and assets. Variables used to determine business reliance are:
 - Years in business
 - Number of services offered
 - Diversity of clients
- **Financial stability:** indicates the financial health and access to financial services of an SME. The variables used to determine financial stability are:
 - Estimated total annual turn-over
 - Proportion of capital need covered with formal credit
 - Capital investments made over the last three years
- **Human capital:** indicates the education level and gender diversity of the SME workforce. The variables used are:
 - The proportion of staff having received a form of tertiary education
 - The proportion of staff with a permanent contract
 - The proportion of casual workers
 - The proportion of women among staff with a permanent contract
- **Technology/assets:** indicates the SME assets and investments in R&D. The variables used are:
 - Investments in R&D
 - Value of buildings
 - Value of equipment

For all of the above indicators, four levels are predefined, either numeric or descriptive, representing progression, with one being the lowest score and four the highest. In a way, the highest level represents what could be considered the desired state of the SME for that particular variable. The average of the scores gives the total score for each dimension. Performance scorecards are presented in Annex 3. An overview of all SME indicators and associated descriptive statistics is presented in Annex 4.

Sampling

Sampling was carried out among SMEs benefitting from AGRA support only as SMEs not benefitting are not expected to be willing to answer questions about the performance of their enterprise. Also, the objective is monitoring the performance improvement of SMEs receiving support from AGRA, over time.

The targeted sample in each country consisted of:

- 10 commercial seed producers
- Five seed companies
- 10 traders
- 10 processors
- 10 agro-dealers
- Five input supply companies

Random sampling was carried out from a list of SMEs provided by AGRA, which was validated with the local AGRA team. The sample distribution of types of SMEs was only considered a guideline, and adapted based on the investment portfolio of AGRA in each country.

In Malawi, 30 SMEs participated in the survey. Because 15 of them operated as both aggregators and agro-dealers, our sample consists of 45 observations:

- 30 agri-value chain actors (aggregators)
- 15 input supply/agro-dealers

Overall, the survey received limited enthusiasm from the SMEs and a low response rate. A number of SMEs decided not to provide answers to questions perceived as sensitive in the survey. More information about SMEs participating in the interviews can be found in Annex 5.

6.3 Performance dashboard

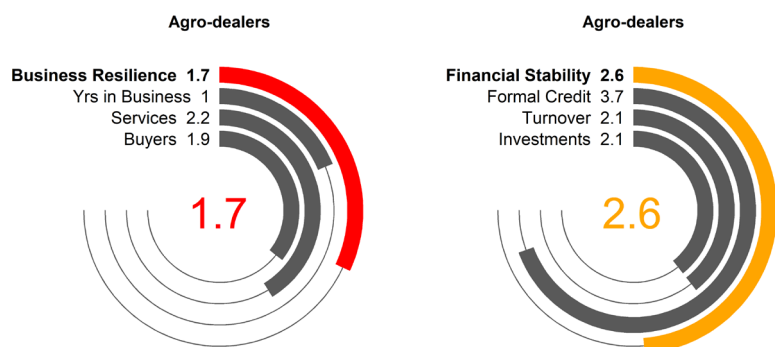
This section summarises the performance of the different types of SMEs on each of the four dimensions: business resilience, financial stability, human capital and technology. A red bar indicates poor performance (score 1-2); an orange bar indicates that there is room for improvement (score 2-3); and green indicates good performance (score 3-4).

Input supply companies/agro-dealers

Fifteen input supply agro-dealers were interviewed. The results on their business resilience show poor performance by the agro-dealers. The low value is due to the fact that these SMEs are new enterprises, having only been in business for three years on average (see Table 15 in Annex). They offer two services on average, mainly retail of improved or certified seeds and chemical fertilisers (see Table 22 in Annex). They deal with two buyers – individual buyers and traders – on average (see Table 21 in Annex).

The companies' financial stability scores indicate close to good performance. These SMEs have an average annual turnover of around US\$86,000 (see Table 19, Annex 4). They also have access to formal credit; but while 53% of the SMEs indicated that they get more than 90% of their credit from formal credit institutions, and 27% get between 75-90% from formal sources, the other 20% still need to improve their access to credit (see Table 24). These SMEs do not invest much into the businesses, declaring one investment in the last three years, on average, and 66% declaring no previous investments (see Table 23 in Annex).

The companies achieve an average score for their human capital, the main challenge being that these SMEs should enrol more female and skilled employees. The companies score low on technology (see Figure 5); few SMEs made investments in technology during the last three years. None of the SMEs made investments in R&D.



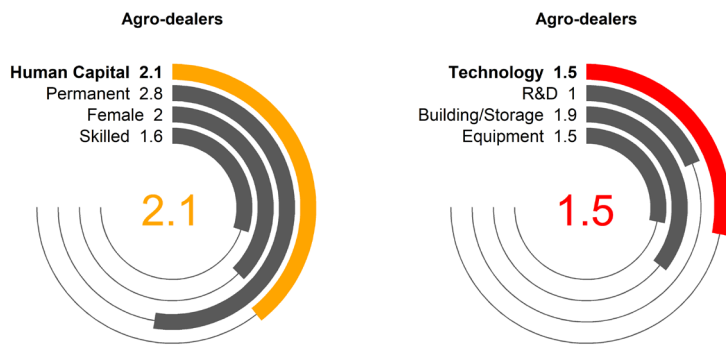


Figure 5: Input supply or agro-dealers' performance scorecard

Agri-value chain actors

Thirty SMEs operating in the agricultural value chain sector as aggregators were interviewed. The companies scored poorly on business resilience. The low value is due to the fact that these SMEs are new enterprises, having been in business for three years on average (see Table 15). They offer limited services, around one on average, mainly the aggregation of farmers' production (see Table 22). They deal with two buyers, mainly individual producers and traders, on average (see Table 21).

The companies achieved an average score for their financial performance. They have good access to formal credit; 40% get more than 90% of their credit from formal credit institutions, and 33% get between 75% and 90% from these institutions (see Table 24). The SMEs made few business investments in the last three years (see Table 23). It may be a good strategy for these SMEs to expand the proportion of female and skilled employees, to increase their average score for human capital. In addition, they need to invest in new technology (see Figure 6).

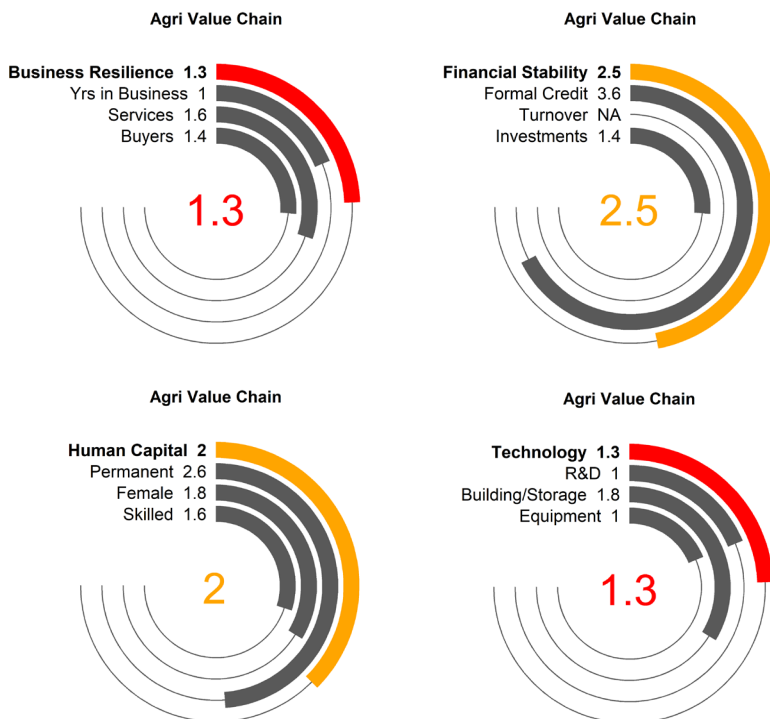


Figure 6: Agri-value chain actors' performance scorecard

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Annex 1. List of key informants in the system analysis

Table 13: List of interview respondents

Organisation	Respondent	Date	Topic discussed	Relation to AGRA
AFAP	Phyness Tehmbulembu	21 November 2019	Fertiliser system	Current AGRA grantee
Agricultural Resources Limited	Charles Govati	14 November 2019	Fertiliser system	System stakeholder
	Alex Shemu	20 November 2019	Fertiliser system	System stakeholder
Agricultural Technology Clearance Committee	Kondwani Makoko	14 November 2019	Seed system	System stakeholder
Cassava: Adding Value for Africa	Dr Vito Sandifolo	21 November 2019	Seed system	Previous AGRA grantee
DARS	Dr Moses Munthari	14 November 2019	Fertiliser system	Current AGRA grantee
Department of Land Resources and Conservation	Gilbert Kupunda	21 November 2019	Fertiliser system	Current AGRA grantee
District Agricultural Development Officer, Lilongwe West	Hastings Yotamu	15 November 2019	Seed/fertiliser	System stakeholder
FUM	Jacob Nyirongo	2 December 2019	Seed system	Current AGRA grantee
Fertiliser Association of Malawi	Vaiwa Chigaru	21 November 2019	Fertiliser system	System stakeholder
Global Seeds	Shane Phiri	15 November 2019	Seed system	Previous AGRA grantee, system stakeholder
MFC	Irene Mlandura	21 November 2019	Fertiliser system	System stakeholder
MUSECO	Dr Ibrahim Benesi	20 November 2019	Seed system	Current AGRA grantee
Optichem	Bobby	18 November 2019	Fertiliser system	System stakeholder
Pannar Seed/Corteva Agri Science	Edward Kabaghe	21 November 2019	Seed system	System stakeholder
Peacock Seeds	Felix Jumbe	14 November 2019	Seed system	Previous AGRA grantee, system stakeholder
Premium Seeds	Frank Samidu	18 November 2019	Seed system	Previous AGRA grantee

Rab Processors/Kulima Gold	Bashir Sama	21 November 2019	Fertiliser system	System stakeholder
RUMARK	McPherry Masangano	15 November 2019	Agro-dealers	Current AGRA grantee
SSU	Suzgo Nyirongo	14 November 2019	Seed system	System stakeholder
STAM	Supply Chisi	20 November 2019	Seed system	Previous AGRA grantee, system stakeholder, potentially future AGRA grantee
SSFRFM	John Mwamadi	19 November 2019	Fertiliser system	System stakeholder
SWET		19 November 2019	Fertiliser system	Current AGRA grantee

Annex 2: Key soil nutrients per district

Table 14: Soil and nutrients per district

Region	Agriculture Development Division	District	pH	N (%)	P (ppm)	K cmol/kg
North	Karonga	Chitipa	5.22	<u>0.066</u>	<u>13.64</u>	0.551
		Karonga	6.08	0.123	28.68	0.311
	Mzuzu	Nkhata-Bay	<u>5.06</u>	0.169	32.02	0.274
		Rumphi	5.46	<u>0.048</u>	36.86	0.500
		Mzimba	5.44	<u>0.058</u>	38.51	0.508
Average			5.45	<u>0.09</u>	29.94	0.43
Central	Lilongwe	Dedza	<u>4.95</u>	0.113	30.82	0.583
		Lilingwe	5.17	0.112	25.10	0.489
			<u>5.13</u>	<u>0.078</u>	55.22	0.350
	Salima	Nkhotakota	<u>5.05</u>	<u>0.078</u>	37.00	0.575
		Salima	5.82	0.100	50.69	0.450
	Kasungu	Kasungu	<u>5.01</u>	<u>0.071</u>	37.75	0.315
		Dowa	<u>5.17</u>	0.114	48.12	0.479
		Ntchisi	<u>4.87</u>	0.103	22.03	0.337
		Mchinji	5.21	<u>0.067</u>	41.21	0.456
	Average			5.15	<u>0.09</u>	38.66
South	Shire Valley	Chikwawa	7.17	0.121	26.63	0.806
		Nsanje	6.64	<u>0.082</u>	48.90	0.510
	Blantyre	Chiradzulu	<u>4.67</u>	0.105	39.81	0.386
		Mulanje	<u>5.13</u>	0.107	17.50	0.640
		Mwanza	5.55	<u>0.051</u>	32.64	0.391
		Neno	5.50	<u>0.096</u>	22.40	0.406
		Blantyre	5.91	<u>0.096</u>	23.28	0.378
		Phalombe	5.61	<u>0.074</u>	31.10	0.540
		Thyolo	4.68	0.118	41.97	0.537
	Machinga	Mangochi	5.55	0.97	48.49	0.551
		Balaka	5.94	<u>0.053</u>	53.82	0.486

	Machinga	5.78	<u>0.032</u>	45.40	0.405
	Zomba	5.59	<u>0.063</u>	46.07	0.287
Average		5.61	<u>0.08</u>	36.15	0.49
	Grand total	5.478	0.095	38.312	0.534

Annex 3: Performance scorecards

Table 15: Business resilience performance scorecard

Business resilience		Performance category 1	Performance category 2	Performance category 3	Performance category 4
Years in business	Ranges (Years)	1-5	5-10	10-15	>15
	Score	1	2	3	4
Number of services	Ranges (#)	1	2	3	>3
	Score	1	2	3	4
Number of buyers	Ranges (#)	1	2	3	>3
	Score	1	2	3	4

Table 16: Financial sustainability performance scorecard

Financial sustainability		Category 1	Category 2	Category 3	Category 4
Percentage using formal credit	Ranges (%)	0%	0%-33%	33%-66%	>66%
	Score	1	2	3	4
Annual turnover (US\$)	Ranges (thousands)	1-10	10-25	25-50	>50
	Score	1	2	3	4
Number of investments	Ranges (#)	0	1	3	>3
	Score	1	2	3	4

Table 17: Human capital performance scorecard

Human capital		Category 1	Category 2	Category 3	Category 4
% Female	Ranges (%)	0%	0%-33%	33%-66%	>66%
	Score	1	2	3	4
% Skilled	Ranges (%)	0%	0%-33%	33%-66%	>66%
	Score	1	2	3	4
% Permanent	Ranges (%)	0%	0%-33%	33%-66%	>66%
	Score	1	2	3	4
	Score	1	2	3	4

Table 18: Technology performance scorecard

Technology		Category 1	Category 2	Category 3	Category 4
Investments in R&D	Ranges (#)	0	-	-	1
	Score	1			4
Building storage	Ranges (#)	0	-	-	1
	Score	1			4
Equipment	Ranges (#)	0	-	-	1
	Score	1			4

Annex 4. SME descriptive statistics

Table 19: SME general characteristics

General SME Characteristics	Input Supply Agro-Dealers	Agri-Value Chain
Years of business	2.7 (0.74)	2.8 (0.89)
Average number of commodities		
<i>Commercialized/traded</i>	-	2.13 (1.06)
<i>Processed</i>	-	0.20 (0.56)
<i>Transported</i>	-	0.33 (0.89)
Commodities commercialized/traded		
<i>Maize</i>	-	40%
<i>Groundnut</i>	-	20%
<i>Soybean</i>		13.33%
<i>Other</i>		6.67%
<i>No answer</i>		20%
Permanent staff	4.96 (3.46)	4.64 (3.22)
Casual staff	7.37 (6.41)	6.78 (3.35)
Total annual turnover (USD)*	85663 (147922)	9450 (.)
Observations	30	15

Standard Deviation in parenthesis. *Incomplete information for Annual Turnover. Detailed information reported below.

Input supply/Agro Dealers: 30%

Agri-Value Chain actors: 6%

Table 20: SME employees

Employees	Input Supply Agro-Dealers	Agri-Value Chain
Permanent Staff	4.96 (3.46)	4.64 (3.22)
Casual Staff	7.37 (6.41)	6.78 (3.35)
% Female(over total)	20%	19%
% Skilled(over total)	13%	13%
Annual Salary	3017	1509
Permanent (USD)*	(2491)	(1337)
Annual Salary Casual (USD)*	1722 (1870)	969 (424)
Daily Wage Casual (USD)*	2.69 (1.25)	2.53 (0.91)

Standard Deviation in parenthesis. *Incomplete information for Annual Salary and Daily wage. Detailed information reported below.

Input Supply agro dealers: Obs salary permanent workers: 70%; Obs salary casual workers 63%; Obs daily wage 86%

Agri-Value Chain: Obs salary permanent workers: 86%; Obs salary casual workers 73%; Obs daily wage 100%

Table 21: SME buyers

Buyers	Input Supply Agro-Dealers	Agri-Value Chain
Projects, programs and government		46%
Farmer organizations, coops, associations	20%	20%
Individual buyers / producers	90%	86%
Traders, input suppliers, wholesalers	86%	86%
Average number of buyers	1.96 (0.61)	2.4 (0.50)
Observations	30	15

Standard Deviation in parenthesis

Table 22: SME services

SME Services	Input supply agro dealers
Retail (sales) of improved / certified seed	73%
Retail (sales) of chemical fertilizers and pesticides	96%
Advisory services / extension	43%
Import of inputs	
Wholesale and country-wide distribution	6%
Manufacturing of inputs	
Average number of services provided	2.2 (0.71)
Observations	30
SMEs Services	Agri Value Chain
Aggregation of farmer production (transport, bulking and storage)	93%
Agri-food processing (transformation of produce)	53%
Transport	13%
Mechanization	
Average number of services provided	1.6 (0.73)
Observations	30

Table 23: SME investment

Investments	Input Supply Agro-Dealers	Agri-Value Chain
Expansion of land area		
Expansion of buildings and/or storage	33%	20%
Upgrading of equipment	30%	26%
Research & Development	16%	
Training of staff		
Increase / injection for working capital	23%	6%
Other	13%	13%
No Investment	33%	66%
Average number of investments	1.16 (1.05)	0.46 (0.83)
Observations	30	15

Table 24: SME percentage credit from formal sources

Access to formal credit	Input Supply Agro-Dealers	Agri-Value Chain
0%		
<10%		13.33%
10-25%	6.67%	
25-50%	3.33%	13.33%
50-75%	10%	
75%-90%	26.67%	33.33%
>90%	53.33%	40%
Observations	30	15

Table 25: SME AGRA support service

AGRA Services	Input Supply Agro-Dealers	Agri- Value Chain
Grant	6%	20%
Loan/Credit		
Training	80%	53%
Technical Assistance	16%	13%
No Service	16%	46%
Average Number AGRA Services	1.03 (0.66)	0.66 (0.72)
Observations	30	15

Standard Deviation in parenthesis

Annex 5. SMEs participating in the interviews

Table 26: SMEs participating in the interview

Input supply/agro-dealers	Agri-value chain aggregators
Tisayiwale	Tisayiwale
Mlimi wa Nzeru	Mlimi wa Nzeru
Mawindo Entreprises	Mawindo Entreprises
Mzingwani Entreprise	Mzingwani Entreprise
Selemani Holdings	Selemani Holdings
Harry Kambani	Harry Kambani
Grade K Agrodealer	Grade K Agrodealer
Frank Kalikho	Frank Kalikho
Jenala Matsimbe	Jenala Matsimbe
Chuma Chili Mthaka	Chuma Chili Mthaka
FD Agrodealer	FD Agrodealer
C.O Agrodealer	C.O Agrodealer
Liwa Agrodealer	Liwa Agrodealer
Debs Agro-dealer	Debs Agro-dealer
Bika	Bika
Chikwendeni	
Mentol Agrodealers	
Novahiwa Investment	
LEEDS Chemical	
Harry Chembe	
Mayankho Agrodealer	
Mwansambo	
Timothy Kawaye	
E & L Investment	
Gondoloni Investment	
Central Chemical	
Agritech	

Hiwa

NOVA INVESTMENT

SunMoon
