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LINKING SOYBEAN PRODUCERS TO MARKETS: AN ANALYSIS OF INTERVENTIONS IN MALAWI & ZAMBIA

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Cover image: Two soy farmers stand with their product on their small plot of land in the Sauri Millenium village locale, 11 September 2007 in Kisumu, Kenya. The Millenium Village concept is based on succesful production based on five years of initial structured financing of rural communities which allows small farmers to reach sustainability and the ability to support themselves © Brent Stirton/ Getty Images

ABSTRACT

This paper seeks to examine the challenges and opportunities soybean producers (who are primarily smallholders) encounter in linking competitively to end markets in Malawi and Zambia, while making comparisons with South Africa's more developed industry. It first gives a theoretical framework for value chain analysis and a general overview of the full soybean value chain in each of the case study countries. The production of soybean most significantly links to the processing of chicken feed and edible oil, which holds opportunities for greater value add. The paper then delves deeper into production and marketing challenges, highlighting various private, public and donor interventions to alleviate these constraints. It first focuses on three bottom-up approaches to improving market linkages: securing quality inputs, increasing production efficiency and improving market information. It then looks at top-down approaches that directly connect producers to markets by linking farmers to traders, input suppliers, processors or government buyers. It concludes with key findings from the case study countries in order to improve production and market linkages, and emphasises that both top-down and bottom-up approaches are necessary to target value chain bottlenecks. It lastly explores opportunities for regional cooperation, targeting these issues through lesson sharing on interventions across countries.

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ABBREVIATIONS AND ACRONYMS

ACE	Africa Commodities Exchange
AHCX	Auction Holdings Commodities Exchange
dti	Department of Trade and Industry
ETG	Export Trading Group
FEWS NET	Famine Early Warning Systems Network
FUM	Farmers Union of Malawi
FISP	Farm Input Subsidy Programme
IBCF	Incentive Based Contract Farming
JSE	Johannesburg Stock Exchange
MOST	Malawi Oilseed Transformation Programme
mT	metric tonnes
NASFAM	National Smallholder Farmers' Association of Malawi
ReNAPRI	Regional Network of Agricultural Policy Research Institutes
RISR	Regional Industrialisation Strategy and Roadmap
USAID	US Agency for International Development
SADC	Southern African Development Community
SAFEX	South African Futures Exchange
SAGIS	South African Grain Information System
SAGNET	Southern African Grain Network
ZAMACE	Zambian Commodity Exchange
ZNFU	Zambia National Farmers Union

INTRODUCTION

Agriculture is immensely important to the African continent in terms of both food security and income generation. However, while 60% of the continent depends on farming as a primary source of livelihood and income,[1] most farming is still at subsistence or low productivity levels, hampered by productivity, regulatory, logistics and investment constraints, among others. This has slowed the process of developing higher value agro-processing activities, which are integral to industrialisation and development.[2]

In recognition of this dynamic, SADC has placed the creation of agricultural value chains at the heart of its strategy for economic development. The SADC Regional Industrialisation Strategy and Roadmap (RISR) presents the development of domestic, regional and global agro-processing value chains as one of three priority growth paths for SADC's industrial development.[3] The strategy highlights oilseed crops as an important value chain for a number of SADC countries. The RISR complements the SADC Regional Agricultural Policy, which seeks out areas of cooperation among SADC countries to improve agricultural productivity and competitiveness, regional trade and market access, public and private investment, and food security.

Among oilseed crops, soybean has received considerable attention in terms of its potential for regional value chains, given that, while there is growing regional production, some countries continue relying on deep sea imports. However, in most SADC countries smallholder farmers are the main producers of soybean. These farmers struggle to link competitively to end markets, whether this market is a trader, processor or direct export. Without more competitive production, broader industrial development, agro-processing and domestic and regional value chain objectives will be difficult to achieve, as will rural development and poverty alleviation.

Among oilseed crops, soybean has received considerable attention in terms of its potential for regional value chains, given that, while there is growing regional production, some countries continue relying on deep sea imports

This paper seeks to examine soybean producer challenges and opportunities in linking competitively to end markets in Malawi and Zambia, where soybean cultivation shows great development potential; while also making comparisons with South Africa's more developed soybean industry. Malawi and Zambia are now broadly meeting domestic soybean demand, and are beginning to explore export opportunities.

Although the paper's analysis is producer driven, it first gives a general overview of the full soybean value chain in each of the case study countries. This value chain has significant linkages to the chicken feed and edible oil industries, with the proviso that constraints along the broader value chain impact market opportunities for farmers. The second half of

1 Diop M, 'Foresight Africa 2016: Banking on Agriculture for Africa's Future', Brookings, 22 January 2016, https://www.brookings.edu/blog/africa-in-focus/2016/01/22/foresight-africa-2016-banking-on-agriculture-for-africas-future/, accessed 19 September 2017.

2 Africa is also home to approximately 60% of the world's arable land, signalling significant untapped potential for agriculture as a source of economic growth and export.

3 SADC, 'Action Plan for SADC Regional Industrialisation Strategy and Roadmap', 2017, https://www.sadc.int/files/4514/9580/8179/Action_Plan_for_SADC_Industrialization_Strategy_and_Roadmap.pdf, accessed 21 July 2017.

the paper then delves deeper into the production and marketing challenges, highlighting various private, public and donor interventions to alleviate these constraints. It concludes with key findings across the case study countries in order to improve production and market linkages, as well as with an exploration of opportunities for regional cooperation targeting these issues.

THEORETICAL FRAMEWORK AND DEBATE

The paper begins by integrating value chain theory and the connection between production and agro-processing by examining the entire soybean value chain. It is essential to examine forms of governance within the value chain, as these political economy dynamics affect opportunities for producers.[4] It then considers the dynamics of production and market linkages, which create bottlenecks in more effectively addressing broader SADC and national industrial development objectives. It primarily examines these issues from a producer-centred approach, looking at how various policy and programme interventions impact producers' (and particularly smallholders') ability to competitively sell to traders or processors, or to export, while also ensuring income generation.

When exploring the impact of interventions, the analysis is organised into 'bottom-up' and 'top-down' interventions.[5] 'Bottom-up' interventions are defined as those improving conditions for farmers in order to create more favourable opportunities for market linkages and investment (ie, more supply driven). In this paper, these include improving access to inputs, agricultural efficiency and access to accurate market information.[6] 'Top-down' interventions are defined as initiatives that directly link farmers to markets, and drive efficiency and cost-competitiveness further down the value chain through these linkages (ie, a demand-driven approach). The examples given are off-taker models linked to processors and commodity exchanges. Neither bottom-up nor top-down initiatives are found to be more effective in linking producers to end markets; rather, both approaches are needed within integrated strategies. The paper examines government, private sector and donor interventions, as well as combinations of the three, to promote the integration of different actors in targeting farmer challenges.

4 Kaplinsky R & M Morris, 'A Handbook for Value Chain Research', IDS (Institute of Development Studies), November 2001, https://www.ids.ac.uk/ids/global/pdfs/ValuechainHBRKMMNov2001.pdf, accessed 21 July 2017.

5 Dixon GR & DE Aldous (eds), *Horticulture: Plants for People and Places. Volume 3: Social Horticulture*. Dordrecht: Springer, 2014; Shepherd A, 'Approaches to Linking Producers to Markets: A Review of Experiences to Date', FAO (Food and Agriculture Organization) Agricultural Management, Marketing and Finance Occasional Paper, 13, 2007, http://www.fao.org/3/a-a1123e.pdf, accessed 12 October 2017.

6 Much literature defines bottom-up approaches as farmer driven, and they are sometimes limited to cooperatives. This paper does not limit this approach to being farmer-led, but rather to interventions that target improving farmer competitiveness without directly providing markets.

Given the strong focus on regional industrialisation and economic development in SADC, the paper also briefly probes the potential for regional collaboration on the issues covered, whether through actual trade and value chains for soybean and soybean products, or through regional knowledge and lesson sharing. This exploration is based on the theory that regional value chain formation provides a more equitable basis for trade among developing countries, as well as a basis for broader global value chain integration.[7]

Ultimately, the paper does not seek to provide encompassing judgements on agricultural value chain development and producer–to–market linkages, but rather examines the specific context for soybean producers in Southern Africa and lessons from initiatives and interventions aimed at improving access to markets, which can be shared across countries and regionally.

Two 'bottom-up' issues that are noted but not covered in-depth are infrastructure development (primarily transport infrastructure to support the movement of inputs, intermediate goods and processed products, as well as water and electricity infrastructure to support processing) and access to finance for small farmers. These are major challenges in the development of agricultural value chains in Africa at large; however, they will not be analysed in full in this paper given that their dynamics are less specific than soybean value chains and have been covered extensively in other literature.

OVERVIEW OF SOYBEAN VALUE CHAINS IN SOUTHERN AFRICA

Understanding the value chain

The following section will outline the characteristics of soybean value chains. The value chain can be broken down most simply into developing/procuring inputs (seed, inoculant, etc.), planting the crop, and processing into cake for animal feed, edible oil or other human food products (either domestically or internationally).

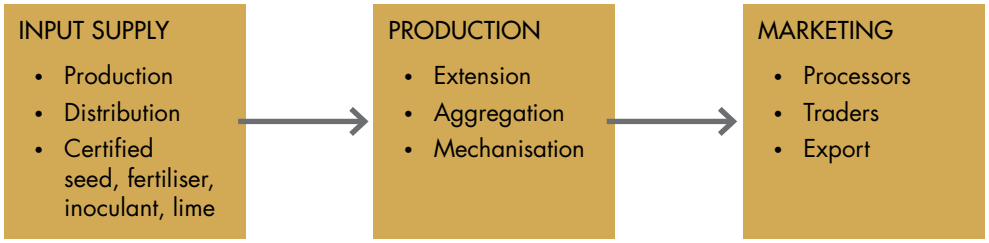
In order to understand the challenges and opportunities for soybean producers, it is important to examine the industries that drive soybean production.

Soybean production in SADC and internationally is mostly driven by profits from the poultry value chain, underpinned by the consumption of chicken in the region. Processed soybean cake is an attractive input into poultry feed because of its high protein content, compared to alternative oilcakes such as sunflower or groundnut. The other key input into poultry feed is maize, which is a staple crop in most SADC countries.[8] The region's poultry industry has grown rapidly in the past few decades, correlating with the evolving consumer tastes of a growing middle class. According to the US Department of Agriculture, poultry

7 Keane J, 'Firms and Value Chains in Southern Africa', ODI Working Paper, 2015, http://documents.worldbank.org/curated/en/840341467999993764/pdf/103071-WP-Box394849B-Keane-Value-Chains-and-Firms-in-SACU-PUBLIC.pdf, accessed 21 July 2017.

8 Shurtleff W & A Aoyagi, 'History of Soybean Crushing: Soy Oil and Soybean Meal', Soyinfo Center, 2016, http://www.soyinfocenter.com/pdf/196/Crus.pdf, accessed 21 July 2017.

FIGURE 1 SOYBEAN VALUE CHAIN PROCESSES



Source: Author's own

imports in sub-Saharan Africa tripled between 2010 and 2014, leading to growing demand for all inputs into the poultry value chain.[9] Insufficient regional soybean production is a key bottleneck in the production of poultry feed, as soybean is mostly still imported. This therefore presents a demand-side pull factor for increased regional soybean production and agricultural development. According to statistics generated by the International Trade Centre's Trademap, the region imported $121,292,000 of soybean in 2016, with a negative trade balance of -$107,481,000.[10] The region also imported $25,607,350 of soy cake in 2016, with a negative trade balance of -$236,928,000. Despite being the region's leading producer of soybean and soy cake, South Africa still faces an average deficit in both. Its soybean and soy cake deficit accounts for the bulk of the regional soybean and soy cake deficit in SADC, at $103,229,000 and $142,759,000 respectively.

Soybean's second biggest market is the edible oil (cooking oil) value chain. Edible oil can be produced alongside soybean cake, as it is made of another part of the soybean. As with soy cake, there is a significant deficit in domestic edible oil production in the SADC region. The region's soybean oil trade balance is -$368,277,000, with every SADC country facing a negative trade balance.[11] Other edible oils used in cooking oil, such as groundnut, palm and sunflower, also have negative regional trade balances, indicating an overall deficit in edible oil production.

Soybean can also be used in human foods – the most common in Southern Africa is textured soy protein. However, this comprises a small percentage of the off-take and is less

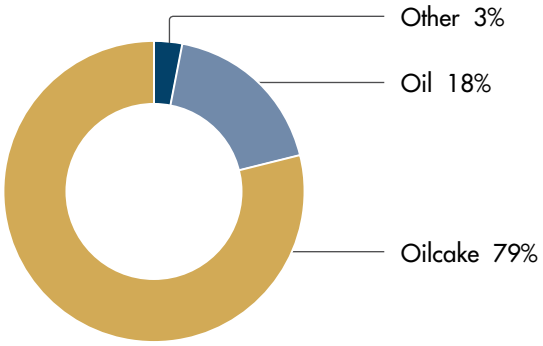
9 The Poultry Site, 'USDA international egg and poultry: Sub-Saharan Africa', 17 July 2014, http://www.thepoultrysite.com/reports/?id=3982, accessed 15 September 2017; BBC, 'Why does Africa import so many chickens?', 12 October 2016, http://www.bbc.com/news/world-africa-37617379, accessed 15 September 2017.

10 Statistics derived from ITC (International Trade Centre), 'Trademap', 5 October 2017, https://www.trademap.org/Index.aspx?AspxAutoDetectCookieSupport=1, accessed 15 August 2017.

11 *Ibid.*

profitable. Soybean also has potential for use in biodiesel, but has not yet been developed in the region for this purpose.[12] This study focuses primarily on the feed and edible oil value chains for soybean, as they represent the most important opportunities for value addition.

FIGURE 2 PERCENTAGE OFF-TAKE OF DIFFERENT SOYBEAN PRODUCERS



Source: Shurtleff W & A Aoyagi, 'History of Soybean Crushing: Soy Oil and Soybean Meal', Soyinfo Center, 2016, http://www.soyinfocenter.com/pdf/196/Crus.pdf, accessed 6 November 2018

Developmentally, the promotion of soybean value chains holds significant potential for Southern Africa, because it is relatively easy for smallholders to grow. It does not require sophisticated or expensive inputs, and grows well in many Southern African climates. It has a relatively short planting cycle and provides quicker cash for small farmers.[13] It is also a nitrogen-fixing crop, which improves the soil quality of land that is used intensively, and thus benefits rotation with other crops such as maize. Soybean clearly also has supply-side incentives and has been positioned by the governments of many Southern African countries as integral to inclusive growth and poverty reduction.

Developmentally, the promotion of soybean value chains holds significant potential for Southern Africa, because it is relatively easy for smallholders to grow. It does not require sophisticated or expensive inputs, and grows well in many Southern African climates

However, despite the ease of entry for smallholders, smallholder soybean production in Southern Africa currently tends to be inefficient with low profit margins, in contrast to other crops in sectors such as horticulture, which are more conducive to smallholder production. Smallholders especially face challenges in efficient production. Issues affecting smallholder competitiveness include use of quality seed cultivars, lack of mechanisation

12 In South Africa, which released a biofuels strategy in 2007, the major barriers to using soybean are the short supply of raw materials and need for industry subsidisation. See Protein Research Foundation, 'Biofuel', https://www.proteinresearch.net/index.php?page=biofuels-introduction, accessed 15 August 2017.

13 Personal interview, South African development bank representative, Johannesburg, 27 July 2017.

Issues affecting smallholder competitiveness include use of quality seed cultivars, lack of mechanisation and scale of production, degradation of crops owing to lack of storage, and lack of information to assist in marketing

and scale of production, degradation of crops owing to lack of storage, and lack of information to assist in marketing. Little value can be realised for any actors along the value chain (input suppliers, farmers, traders and processors) without addressing these issues. These productivity constraints are among the biggest challenges for soybean producers in linking to end markets within SADC and Southern Africa.

Production and processing in in Malawi, Zambia and South Africa

The following section gives a brief overview of the soybean industries in South Africa, Zambia and Malawi.

TABLE 1 SNAPSHOT OF THE SOYBEAN INDUSTRY IN SOUTH AFRICA, ZAMBIA AND MALAWI

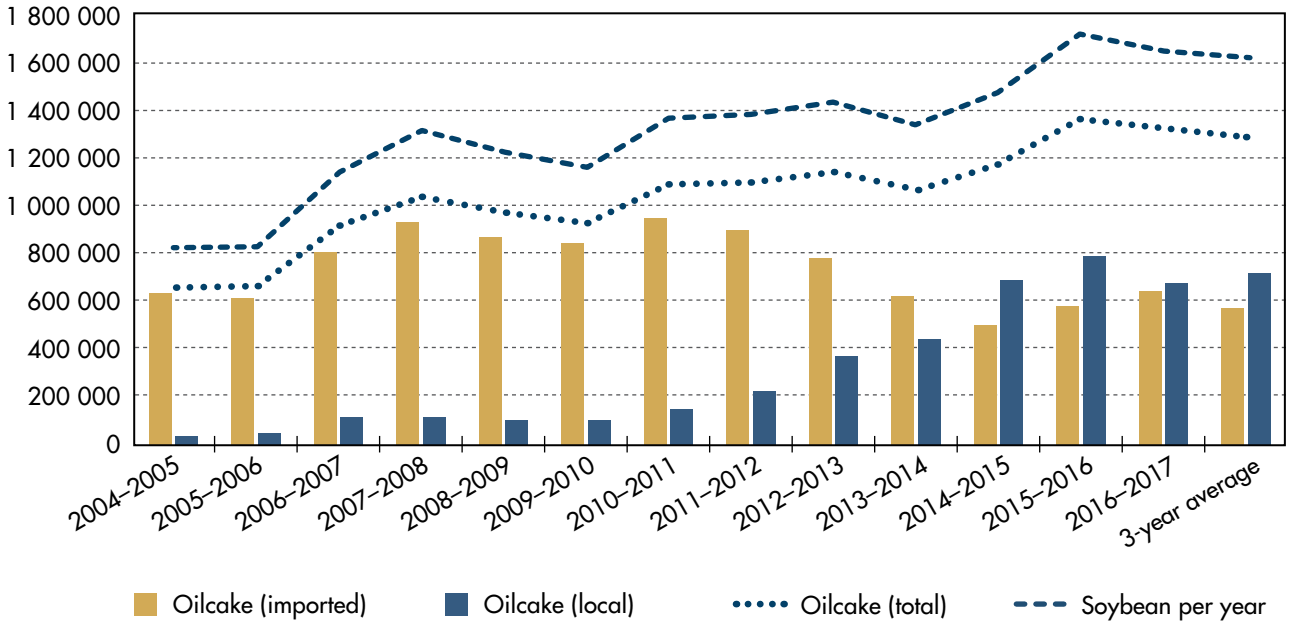
South Africa	Zambia	Malawi
• 1 316 000mT in 2016/2017 • Commercial production • Deficit in soybean and soy cake • Soybean Strategy (2012) and Manufacturing Competitive Enhancement Programme (2013) to drive feed VC, processing capacity, increase smallholder involvement	• 350 000mT in 2017 • Tremendous spike in production, driven by increase in poultry consumption • 60% commercial, 40% smallholder • Surpluses in bean and cake, some regional links • No specific soybean policy or strategy	• 132 417mT in 2016/2017 • Entirely smallholder production • Smaller but self-sufficient poultry industry, small soybean surplus • National Export Strategy: • Soybean, sunflower, cotton, groundnut • MOST, Oilseeds Technical Working Group to support strategy

Sources: South Africa, dti (Department of Trade and Industry), Agro-Processing Unit Industrial Development: IDPD (Policy Development Division), 'Strategy for the Development of the Soybean Sector in South Africa'. Pretoria: dti, May 2012; MCEP (Manufacturing Competitive Enhancement Programme), http://www.investmentincentives.co.za/mcep, accessed 27 November 2018; Malawi, Ministry of Industry and Trade, 'Malawi National Export Strategy 2013–2018', http://www.eisourcebook.org/cms/March_2013/Malawi%20National%20Export%20Strategy%20(NES)%20Main%20Volume.pdf, accessed 27 November 2018; MOST (Malawi Oilseeds Sector Transformation), http://www.most.mw/, accessed 27 November 2018; FAO (UN Food and Agriculture Organization), 'FAOSTAT: Data', http://www.fao.org/faostat/en/#data, accessed 18 August 2017

In all three countries, soybean is rotated with maize, the most important staple crop in the region, and in Malawi it is also often rotated with tobacco. South Africa has by far the largest commercial soybean industry in the region, with 1 316 000 metric tonnes (mT)

production in 2016/2017.[14] This is in part owing to a targeted policy focus to support the industry. The Department of Trade and Industry (dti) released a Soybean Strategy in 2012, which focused on growing domestic value addition in soybean value chains through increasing planting, improving productivity and linking production to underutilised domestic processing capacity.[15] Support for these objectives was also outlined in the dti's Industrial Policy Action Plans. In Figure 3, the gold bar indicates total oilcake produced, and shows significant increases in production after these policy changes in 2012, along with a decrease in imported oilcake (blue bar).

FIGURE 3 SOYBEAN AND OILCAKE PRODUCTION IN SOUTH AFRICA



Source: Van der Walt L, 'Seisoensoorsig en oorwegings vir die komende seisoen' (Seasonal review and considerations for the coming season), *SA Graan/SA Grain*, 19, 1, November 2017

Zambia also has a commercial soybean industry, which in the past five years has seen an influx of smallholders entering the sector – they are now responsible for almost half of production. Production in Zambia has grown rapidly in recent years, from 55 000mT in 2007 to 350 000mT in 2017.[16] Despite this growth (mostly owing to demand from the

14 Statistics derived from FAO (UN Food and Agricultural Organization), 'FAOSTAT: Data', http://www.fao.org/faostat/en/#data, accessed 18 August 2017.

15 dti (Department of Trade and Industry), Agro-Processing Unit Industrial Development: IDPD (Policy Development Division), 'Strategy for the Development of the Soybean Sector in South Africa'. Pretoria: dti, May 2012.

16 FAO, *op. cit.*

poultry industry, which has grown on average 20% in the past 10 years),[17] government policy support is still primarily focused on maize production.

Malawi's soybean production has also grown, albeit from a smaller base. Production increased from 40 000mT in 2005 to 132 417mT in 2016/2017.[18] In contrast to Zambia and South Africa, Malawi's soybean industry is comprised almost entirely of smallholders. The Malawian government has also placed a clear focus on soybean value chain development in efforts to diversify away from traditional cash crops such as tobacco. In the country's 2013 National Export Strategy, four oilseeds are prioritised for increased export competitiveness: soybean, sunflower, groundnut and cotton. This policy has spurred a three-year UK Department for International Development-funded oilseed support programme, the Malawi Oilseed Transformation Programme (MOST), which complements the Oilseeds Technical Working Group under the Ministry of Industry and Trade.[19] Both interventions primarily target improved production, which is necessary for smallholders to mechanise and increase acreage, and ultimately attract investment to processing. MOST does not engage in any direct project delivery, but supports delivery through the local private sector.

Despite impressive growth in production in both Zambia and Malawi, production volumes still pale in comparison to those in South Africa (Zambia's production is approximately one-quarter of South Africa's), let alone the top producers globally. The top 10 soybean-producing countries produce between 3 and 20 million mT on average per year.

With regard to soybean cake processing, in all three countries poultry feed processors are most often vertically integrated into the poultry value chain in a hierarchical value chain structure,[20] which is dominated by a small number of companies. In Zambia much of the poultry and poultry feed industry is driven by investment from large South African processors, whereas in Malawi the poultry feed industry is smaller and primarily consists of local companies. In Zambia (and less often Malawi), smallholders are also linked into this vertical integration through contract farming, donor off-take programmes or informal relationships. Difficulties in the investment environment in Malawi, such as high interest rates/expensive finance, unreliable electricity and water, and exchange rate fluctuations, have created barriers to attracting foreign investment. Zambia faces similar challenges, but they have become less pronounced, leading to greater regional investment.[21]

17 Poultry Association of Zambia, 'Doing Business in the Poultry Industry', Presentation, 26 April 2017, https://images.agri-profocus.nl/upload/PAZ_Presentation_at_the_Doing_busines_forum-Poultry-_26th_APRIL_2017-11498636815.pdf, accessed 5 October 2017.

18 FAO, *op. cit.*

19 MOST (Malawi Oilseed Sector Transformation), http://www.most.mw/, accessed 15 May 2017.

20 In a hierarchical value chain structure, the lead firm takes direct ownership of the chain. See Humphrey J & H Schmitz, 'Developing Country Firms in the World Economy: Governance and Upgrading in Global Value Chains', INEF (Institut für Entwicklung und Frieden), 2002, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.557.1063&rep=rep1&type=pdf, 17 July 2017.

21 Personal interview, Malawi donor representative A, Lilongwe, 21 August 2017; personal interview, Malawi donor representative B, Lilongwe, 22 August 2017; personal interview,

BOX 1 CONSTRAINTS FACING EDIBLE OIL PROCESSING

Several factors have prevented the edible oil value chain from taking off in the region in the way that feed has, despite the demand. Although edible oil faces the same quality constraints from inputs and production as soybean cake, it is also compromised by many trade and regulatory challenges. In low-income households edible oil still faces significant competition from imported palm oil, which has a much cheaper price point, although it is less healthy than oilseed-based oils. Even for a growing consumer base that prefers healthier oils, local production cannot compete with cheaper and better-quality sunflower oil imports from South Africa and Eastern Africa. In the latter case, these imports enjoy duty-free status under the Common Market for Eastern and Southern Africa agreement (although some of this oil is thought to originate from East Asia).

Corruption is also a major challenge in Zambia and Malawi. First, refined oils are improperly labelled as crude and then imported. This dynamic threatens the profitability of locally invested oil refiners, as refined oil is entering the country without proper taxation. Second, cheap palm oil is smuggled in from Mozambique.

Also important is the value-added tax (VAT) on edible oil, which edible oil processors believe should be removed, as it disincentivises local production while making corruption more attractive. The issue, however, is not clear-cut, as these revenues are important to the financially pressured governments of Zambia and Malawi. Malawi has recently removed the VAT, while in Zambia such a move is still under consideration.

As a result of these factors, much of the soybean produced domestically is not intended for edible oil production, which decreases its overall competitiveness. Governments should consider adjusting the tariff/quota regime for edible oil to a level that better stimulates local production, and industry should put pressure on government to take the corruption issues seriously. While smuggling is difficult to patrol in terms of capacity at borders, mislabelling of oils can be more easily policed.

Sources: Personal interview, Zambia oilseed processing company representative A, Lusaka, 13 September 2017; personal interview, Zambia industry association representative A, Lusaka, 11 September 2017; personal interview, Zambia donor representative A, Lusaka, 13 August 2017; personal interview, Zambia industry association representative B, Lusaka, 11 September 2017; personal interview, Zambian researcher A, Lusaka, 11 September 2017; personal interview, Zambia oilseed processing company representative B, Lusaka, 13 September 2017; personal interview, Malawi donor representative A, Lilongwe, 21 August 2017; personal interview, Malawi oilseed processing company representative A, Lilongwe, 25 August 2017; personal interview, Malawi oilseed processing company representative B, Lilongwe, 25 August 2017; personal interview, Malawi government official A, Blantyre, 25 August 2017

Zambia commodities trading company representative A, Lilongwe, 13 September 2017; personal interview, Zambia oilseed processing company representative A, Lusaka, 13 September 2017.

With regard to edible oil, Zambia and Malawi have small soybean crushing industries. In both countries there is investment from international companies, such as Tanzania's Mount Meru in both and US company Cargill in Zambia. These companies use local soybean and imported unrefined oil for further processing.

In both countries several international commodity traders are engaged in the soybean trade. These traders often integrate processing and input production and supply into their operations.

Overall, field interviews in Zambia and Malawi showed that the vertical integration of the poultry-feed segment of the soybean value chain does not necessarily extend to soybean production. While processors of both feed and edible oil prefer large and consistent supplies from commercial farmers, the majority in Zambia and Malawi indicated that they also received soybean from local smallholders (often via traders) through contract and informal sales. Transportation bottlenecks function as a non-trade barrier for smaller companies and favour local production linkages, as inadequate infrastructure makes the transportation of deep sea soybean imports to landlocked Zambia and Malawi more expensive. However, in the long term this limits producers' overall competitiveness, regionally and globally. Additionally, both Zambia and Malawi allow only soybeans that are not genetically modified, which acts as another non-trade barrier to cheaper imports from South Africa. Interviews with traders and processors suggested that the quality and cost-competitiveness challenges detailed above are the greatest barriers to increasing smallholder linkages. Field interviews in Zambia and Malawi painted a picture of a soybean industry where there has been an increase in the number of smallholder farmers, who now have surplus product that they are often unable to market at a decent price (domestically and globally) owing to competitiveness constraints.[22]

This brief analysis shows that many of the issues preventing greater value chain development, whether serving domestic, regional or international markets, can be attributed to production competitiveness challenges. Government, private sector and donor interventions have targeted these barriers, both through bottom-up efforts to improve smallholders' efficiency and ability to market and through top-down approaches to improve competitiveness by linking smallholders to processers or large traders.

The central challenge in the soybean value chain is its competitiveness: the ability of producers (particularly smallholders) to effectively link their products to market

LINKING SOYBEAN PRODUCERS TO END MARKETS

The central challenge in the soybean value chain is its competitiveness: the ability of producers (particularly smallholders) to effectively link their products to market. This section examines recent policy and programme developments that have impacted competitive soybean production and market access in Zambia and Malawi (examples from South Africa are included throughout, from a comparative perspective). The interventions are presented as bottom-up production and market improvements, as well as top-down

22 A couple of years ago, when many smallholders entered soybean in Zambia, the price dropped and surplus product was exported to South Africa, but at a price that was not sustainable to cover the costs of farmers.

initiatives to link producers directly to markets. Success is determined by increased linkages to end markets and improved competitiveness and profit margins for farmers. Interventions by government, private sector and donors, as well as combinations of these, all play a role in improving competitive soybean production.

Bottom-up approaches to improve market linkages

The following section examines three examples of bottom-up approaches to farmer development: improving input provision, production efficiency and market information.

Securing quality inputs

Access to and knowledge of quality inputs remain a persistent challenge in Zambia and Malawi, particularly for smallholder farmers, and can have a serious impact on both the quality and efficiency of production. The most important inputs for soybean production are certified seed, inoculant, fertiliser and lime. Both Zambia and Malawi have difficulties in accessing inputs, while Malawi also faces significant quality constraints. Various interventions have been introduced to target these issues.

Zambia and Malawi have long-standing Farm Input Subsidy Programmes (FISPs), under which the government provides subsidised inputs (traditionally targeted at maize production) in order to ensure most farmers can afford quality inputs. The FISP is needed in these countries owing to concerns around food security, lack of knowledge of appropriate inputs, and the high costs of imported inputs (the result of expensive transportation). Despite this, the FISP can be a very difficult programme to manage, as subsidisation creates market distortions. In addition, when a government plays a large role in markets it is susceptible to corruption.

In Zambia, the FISP and the Food Reserve Agency's price support for maize comprises 80% of the Ministry of Agriculture's budget.[23] However, farmers still face significant challenges in accessing quality inputs, especially for other crops such as soybean, and even in accessing maize, owing to inefficiencies in the programme. Currently, an e-voucher system is being rolled out nationally as a new implementation mechanism for the FISP. Initially an initiative of the Zambia National Farmers Union (ZNFU), e-vouchers allow farmers to use government-subsidised pre-paid cards to make choices on inputs and where to buy them. The programme started with 35 000 users and now has 587 000, and is widely considered a success.[24] Despite initial technological difficulties, it is now being rolled out nationally. This mechanism primarily benefits rural farmers, who have a choice

23 Kuteya AN *et al.*, 'An In-depth Analysis of Zambia's Agricultural Budget: Distributional Effects and Opportunity Cost', IAPRI (Indaba Agricultural Policy Research Institute) Working Paper, 107, April 2016, http://www.iapri.org.zm/images/WorkingPapers/wp107.pdf, accessed 6 November 2018.

24 Personal interview, Zambia industry association representative B, Lusaka, 11 September 2017; *ibid.*

of inputs near to them, as well as the private sector, which was initially crowded out when the FISP was disbursed through the government. This decentralised mechanism has thus far allowed greater efficiency and less corruption and abuse of funds, as farmers can choose private sector options. The e-voucher programme also ameliorates some of the market distortions that resulted from past government subsidies that only targeted maize, as farmers can now spend the voucher on crops such as soybean. The next step, which is currently in progress, is moving from a pre-paid card to an e-wallet, in order to further improve rural access.[25] It is hoped that this mechanism can sustain long-term benefits in input provisions through increasing the transparency and economic efficiency of the FISP, while also encouraging greater crop diversification.

In Malawi, while the FISP previously only applied to maize, soybean production has benefitted greatly from the addition of legumes to the programme. However, Malawi faces similar challenges as Zambia in terms of FISP delivery, such as delays in government payments to input suppliers and political interference. The government has found it difficult to integrate private companies into the programme, and could benefit from cross-country learning and the possible application of elements of Zambia's e-voucher system.

However, in Malawi some of the biggest challenges relate to the availability of quality seed. Corruption and counterfeit seed pose significant barriers to certified seed availability. The Seed Services Unit is overextended in terms of its capacity to carry out seed inspections, which exacerbates this problem.[26] Land availability in the country is also a problem for the domestic seed multiplication of new varieties, which requires significant acreage.[27] Because of these challenges, Malawi receives significant donor support in the development and multiplication of certified seed through institutions such as the International Crops Research Institute for the Semi-Arid Tropics and the US Agency for International Development (USAID).[28] Many of the outstanding issues are addressed in Malawi's new Seed Policy, which was passed in 2018.

This is in contrast to Zambia, which has more quality seed varieties available. In part, the size of the maize and soya crop has allowed bigger and more efficient seed companies to operate in Zambia. However, the country is also developing its own capacities in seed research, with a focus on strong indigenous varieties. The Seed Control Certification Institute has received external funding support, has been effective in regulating seed, and has a good relationship with its industry and standards body.[29] Importantly, this institution has the human resource capacity to regulate properly. This could be an

25 Zambia industry association representative B, *op. cit.*; personal interview, Zambian researcher B, Lusaka, 11 September 2017.

26 Malawi donor representative A, *op. cit.*; personal interview, Malawi government official A, Blantyre, 25 August 2017; personal interview, Malawi seed company representative, Blantyre, 25 August 2017; personal interview, Malawi industry association representative A, Blantyre, 24 August 2017.

27 Malawi seed company representative, *op. cit.*

28 Personal interview, Malawi donor representative D, Lilongwe, 1 September 2017.

29 Personal interview, Malawi donor representative E, Lilongwe, 23 August 2017.

opportunity for peer learning between Zambia and Malawi, which could be integrated through governments and donors' targeting seed issues domestically. Both Zambia and (especially) Malawi would also benefit from a serious focus on domesticating the SADC Seed Protocol, which allows seed varieties that are tested in two SADC countries to be sold in a third country. This greater regional liberalisation would help to make certified seed more available and increase competition.[30]

In spite of these persistent challenges related to seed in Malawi, the country has made progress in providing inoculant, which can double the soybean output when utilised properly. For the past three years, MOST has been supporting local private sector production of inoculant. Previously it was solely distributed by the Department of Agricultural Research and Services and supply was not meeting demand. MOST has supported a private sector company through technical assistance and risk sharing, and distribution has risen from less than 10 000 sachets in 2013/14 to more than 150 000 in 2016/17. Thus far the programme has led to increases in production, and MOST is also looking to support a second private provider to increase competition.[31] Such a programme might also gain traction in Zambia, where the primary provider of inoculant is the government. However, the e-voucher element of the Zambian FISP can also help small farmers access inoculant, who use it much less than the commercial sector.

Trade restrictions on mineral exports in Africa have not delivered the expected positive impacts on the development of value-added activities

Increasing production efficiency

While quality inputs play a significant role in increasing yields and farmer margins, efficient production practices are just as necessary. This indicates the importance of extension services and a high level of mechanisation. In both Zambia and Malawi smallholders face financial constraints in procuring equipment to support modernised production, access to irrigated land and extension/training. The need for irrigation becomes increasingly important as the effects of climate change become more pronounced, but it is expensive to finance.

One ostensibly low-hanging fruit to enhance production is through expanding the land under cultivation, which will allow inputs to be used more efficiently. Malawi faces difficulties in terms of access to land, as it is a small country and most land is under customary ownership and cannot be bought for commercial use. This puts the country at a disadvantage in terms of increasing efficiency by increasing the amount of land under cultivation. However, the Malawian government has shown its commitment to tackling this issue with the recent passage of the Land Bill, which allows for the purchase and registration of customary land. This in turn could lead to increases in soybean

30 Malawi donor representative A, *op. cit.*; personal interview, Zambian commodities trading company representative B, Lusaka, 10 September 2017.

31 MOST, 'Malawi Oilseeds Sector Transformation Disrupting Market System Dynamics in Agriculture: Case Study'. Blantyre: MOST, August 2017; Malawi donor representative A, *op. cit.*; Malawi government official A, *op. cit.*

productivity.[32] In Zambia there is ample uncultivated land available for purchase, which has helped increase efficiency through expanded acreage.

However, merely increasing the land under cultivation is neither sustainable nor feasible for many smallholders. Increasing productivity per acre becomes important, which can be aggregated by cooperatives, buyers, etc. In Malawi and Zambia, government and farmer association extension services are both severely underfunded and struggle to find the most impactful approaches. This is a prime area for greater cross-country learning and collaboration, as different extension models have been piloted throughout and even beyond the region that hold valuable lessons in both their successes and failures.

In Zambia, the largest farmers union, the ZNFU, has tried to target the need for extension within the context of limited finance by piloting an e-extension service via mobile phone. However, farmer uptake has been low. This may be because achieving buy-in to change habits and practices is difficult enough in person, and driving these changes through mobile SMS likely adds another layer of difficulty. Also, the level of complex knowledge that can be shared via an online platform is limited; even more so when literacy is a barrier. The ZNFU is now looking into a more interactive call-centre platform where specific issues can be addressed in conversation. E-extension has recently grown in popularity as an option for many countries in the region, and further examining the challenges of implementation in Zambia could help to avoid some of these pitfalls in other countries.

In Malawi, much of the extension and training is still implemented through a traditional cooperative/association model, which stems from colonial-era state-owned cooperatives. Cooperative formation around irrigation schemes is especially prevalent. Many cooperatives and associations are organised under three umbrella institutions: the Farmers Union of Malawi (FUM), the National Smallholder Farmers' Association of Malawi (NASFAM) and the Malawi Union of Savings and Credit Cooperatives. Processors indicated that they did sometimes buy soybean from these structures, particularly NASFAM. However, most cooperatives are donor-dependent, which hampers their effectiveness, and struggle with effective governance and business models (a challenge for cooperatives worldwide). Zambia, in contrast, has moved away from cooperatives, with contract farming (detailed in later sections) more common.

South Africa's smallholder development programmes might also hold lessons for other countries in the region, especially Malawi, which faces the same constraint of increasing production on limited land. Despite the commercialisation of South Africa's soybean industry, there is a recognised need to bring smallholders from previously disadvantaged backgrounds into the value chain, and South Africa is increasingly implementing smallholder development programmes. GrainSA, the South African farmers' association representing the grain and oilseed industry, runs the primary programmes for small-scale development. These include decentralised training programmes in nine regions

32 Chilunga Z, 'Malawi President Mutharika assents to land bills', Nyasa Times, 14 September 2016, https://www.nyasatimes.com/malawi-president-mutharika-assents-land-bills/, accessed 14 October 2017.

targeted at providing farmers with both the knowledge and resources to upscale. The main interventions are study groups, which disseminate best practice for farmers, and demonstration groups, which showcase these practices. This is combined with tailored support, including business plan development to help farmers grow in scale. The programme broadly works with three categories of farmers: subsistence (>10ha), smallholder (10–250ha) and new-era developing (>250ha). Grain SA programmes are funded by a commodity levy on members.[33] Given that there are significant funding constraints for extension in Zambia and Malawi, this could be an entry point for donor assistance. Donors could work with local industry associations in learning from South Africa in terms of its strategic focus on smallholder upscaling. Importantly, South Africa's programmes have been implemented under a targeted policy framework: the 2012 soybean strategy, which supports the diversification of smallholders into soybean through technical and market information. The NES in Malawi creates space for such interventions specifically in soybean, but Zambia could benefit from a targeted policy framework to underpin similar programmes.

Driving improved efficiency among the large proportion of smallholders involved in soybean is not an easy task. Even with well-designed programmes to improve practices, the need for finance for equipment, storage that preserves product quality, and irrigation is a persistent constraint in many policies and programmes. There is room for a greater policy focus on commercial viability and support for mechanisation models at both national and industry association levels. However, the reality is that government finance is limited, and banks are not willing to lend to small farmers. Many donor programmes are targeted at finding innovative ways to improve access to finance across all agricultural sectors, not only soybean. This challenge also shows why top-down, private sector-driven approaches to market linkages can play an important role in improving efficiency, as they often provide smallholders with a supportive infrastructure and the tools necessary for mechanisation.

Examining these input and production challenges from a broader perspective is important. For example, because of inefficiencies in the FISPs only limited government finance can be devoted to mechanisation.[34] This dynamic contributes to a cycle of dependency on subsidies to support production that, while benefitting from improved inputs, does not achieve the requisite level of productivity that is needed to lessen reliance on government support. Improvements in input quality and provision would assist in freeing up funds for government extension and mechanisation support.

Improving market information

A key issue raised in stakeholder consultations in Malawi and Zambia that inhibits effective smallholder market linkages is access to market information, which is unreliable

33 Personal interview, South African industry association representatives, Johannesburg, 30 October 2017.

34 Zambia donor representative A, *op. cit.*; Zambia industry association representative B, *op. cit.*; Malawi donor B, *op. cit.*

in both countries. Better access could empower smallholders to improve planning and find the best market opportunities, while lessening opportunities for unfair pricing by traders and buyers. Accurate market information is also important for traders and processors in their country investment decisions. Currently, the Zambian and Malawian governments are involved in the market through setting prices, imposing import and export restrictions and buying and selling maize, as well as imposing export bans in soybean. More accurate market information could ultimately lead to less need for government intervention in markets for food security purposes, owing to greater knowledge of current and predicted stocks. There would also be more planning capacity to assess how much soybean is needed for domestic processing, and whether quotas rather than full export bans (which collapse prices for smallholders) should be imposed. Less government intervention will also ensure predictability, which is important for private sector actors.

The need for better market information is especially pronounced for commodities such as soybean, where growth has been rapid in SADC countries in recent years and small quantities of product move frequently. This could also facilitate effective regional value chain formation, considering the small surpluses in countries such as Zambia and Malawi while other SADC countries face deficits.

The following section will therefore explore some of the marketing challenges in Zambia and Malawi, using the example of South Africa's grain and oilseed markets as a framework to compare both challenges and opportunities for these countries.

South Africa's organised grain and oilseeds institutions provide ample information and market opportunities to value chain actors. While the context in Malawi and Zambia is decidedly different, lessons can still be learned. After the government-controlled marketing boards of the apartheid era were abolished, various independent institutions that govern the grain and oilseed industry were established. The South African Grain Information System (SAGIS) is one of the most important building blocks in the industry's market information system. SAGIS provides accurate estimates of the stocks of oilseed and grain crops. This is enabled legislatively through a marketing act that legally mandates all actors in the value chain (producers, processors, traders, etc.) to provide stock information to SAGIS. The Crop Estimates Committee (a public–private partnership) provides pre-season planting estimates, complemented by a committee that estimates supply and demand (also a mix of public and private funding). These institutions are supported by the Bureau for Food and Agricultural Policy, which uses this data to provide informed policy analysis and scenario planning on a macro level. This interplay of institutions has been instrumental in empowering farmers to know when and what to plant, store and market.[35] It also assists traders in knowing what to export and import, and helps policymakers to make appropriate agricultural and policy decisions to ensure food security and economic

35 South African industry associations representatives, *op. cit.*; Zambian commodities trading company representative B, *op. cit.*; personal interview, South African research institute, Pretoria, 21 September 2017; personal interview, South African oilseed processing company representative, Johannesburg, 31 August 2017; South African development bank representative, *op. cit.*

growth. Given that there are multiple sources of information, the system has checks and balances that help to detect questionable information.

Challenges in Zambia and Malawi include both the accuracy of market information and its reach. While commercial farmers and large traders and processors can access the best available market information from private services, such as Commodity Insights Africa, smallholders are at a disadvantage because they do not have the information to make informed decisions on what to plant, and when and where to sell their products. This has contributed to the number of soybean smallholders in Zambia and Malawi who are struggling to sell their surpluses. It also allows traders to take advantage in terms of the prices they offer.[36] In a country such as Malawi, where smallholders comprise the bulk of soybean producers, this renders the market system as a whole largely ineffective.[37] Even when commercial farmers have greater access to information, these private services rely on questionable in-country data collection, which often comes from anecdotal/informal accounts. This demonstrates the need for improvement and formalisation.[38]

While commercial farmers and large traders and processors can access the best available market information from private services, smallholders are at a disadvantage because they do not have the information to make informed decisions on what to plant, and when and where to sell their products

In terms of existing institutions, in Zambia the industry and government currently have a stocks monitoring committee, where stakeholders in the value chain report their stocks. This information is then compiled into a report. However, stocks are not checked consistently, and it is generally agreed that there is an approximately 30% margin of error in reported stocks.[39] This is partially owing to the fact that the committee does not meet regularly. While general estimates can be somewhat useful for policymakers, industry players such as input suppliers, farmers, traders and processors need more accurate information to make informed business decisions. A more precise and independent mechanism is necessary (in Zambia, the stocks monitoring committee is chaired by the Ministry of Agriculture) to curate accurate information, similar to the multi-institutional system in South Africa. Such a mechanism would allow adequate price information to be disseminated to stakeholders. The case is even stronger in Malawi, which does not have any proper system to monitor stocks.

36 Personal interview, Zambian commodity trading company representative C, Lusaka, 14 September 2017; Zambian oilseed processing company representative B, *op. cit.*; Malawian oilseed processing company representative A, *op. cit.*; Zambian commodities trading company representative B, *op. cit.*

37 Malawi donor representative A, *op. cit.*; personal interview, Malawi agricultural investor representative, Lilongwe, 21 August 2017; personal interview, Malawi commodities exchange, Lilongwe, 28 August 2017; Malawi donor representative C, *op. cit.*; Malawi industry association representative A, *op. cit.*; personal interview, Malawi industry association representative B, Lilongwe, 23 August 2017; Malawi oilseed processing company representative A, *op. cit.*; personal interview, Malawi oilseed processing company representative B, Lilongwe, 25 August 2017; Malawi government official A, *op. cit.*; Malawi seed company, *op. cit.*

38 Zambia commodities trading company representative C, *op. cit.*; Zambian oilseed processing company representative A, *op. cit.*

39 Zambia commodities trading company representative C, *op. cit.*; Zambian researcher B, *op. cit.*; personal interview, Zambian industry association C, Lusaka, 14 September 2017.

Although developing systems similar to that of South Africa has been discussed in industry, donor and government circles throughout Southern Africa for years, the Southern Africa Trade and Investment Hub (SATIH), funded by USAID, is now engaged in a promising project. In Zambia, the SATIH is in the process of developing 'ZAGIS', based on the SAGIS model in South Africa.[40] The SATIH has been meeting with industry stakeholders to gain buy-in and identify challenges, with the aim of pitching a polished proposal to government. The Zambian government has shown some interest in such a mechanism, but translating interest into commitment is a major hurdle. At this stage, a number of challenges remain. Foremost is the need for a champion for this initiative, which cannot survive with the primary drive coming from an external funder. While most stakeholders are in favour of ZAGIS in theory, it will require a combined effort from all industry stakeholders to put the necessary pressure on government to accept the initiative. While industry stakeholders recognise that ZAGIS will benefit all stakeholders in the long term, in the short term in a disjointed market, withholding information can often benefit farmers and companies. The incentive to withhold information is strengthened by a lack of trust between the public and private sector in terms of transparency and handling of information. An effective ZAGIS will undoubtedly require confidence and faith from both parties.[41]

Also critical to the effective functioning of ZAGIS is the passing of the Marketing Act, which has been sitting in Parliament in Zambia for an extended period of time. Without a legal framework mandating and regulating the provision of information, ZAGIS is not viable. The government's initial interest in ZAGIS and pledges to deregulate the maize market are perhaps positive signs. Again, this will depend on the application of pressure on government to move this legislation forward. Agriculture is an important component of the Zambian economy, so a united industry can have a strong influence.

In Malawi there is interest in a similar system, although at a less advanced stage. From a technical perspective, the collection of information from farmers will be much more difficult in Malawi given farms' small size and considerable fragmentation. Farmers' associations such as NASFAM must play a central role in monitoring smallholders in order to collect accurate information, but they face capacity constraints.[42] It will also be more difficult to drive buy-in, given that there are fewer large industry players (both commercial farmers and multinationals) able to influence the government. In this case, some of the traders and medium-sized processors in Malawi should form a united front in advocating for better market organisation. Stakeholder interviews did demonstrate strong interest from private sector actors.[43] This is essential to generate a legal framework, which is not

40 Malawian donor representative E, *op. cit.*

41 *Ibid.*

42 Malawi seed company, *op. cit.*; Malawi donor representative A, *op. cit.*

43 Malawi donor representative A, *op. cit.*; Malawi oilseed processing company representative B, *op. cit.*; Malawi seed company, *op. cit.*; Malawi oilseed processing company representative A, *op. cit.*; Malawi industry association representative A, *op. cit.*; Malawi commodities exchange representative, *op. cit.*

yet in place in Malawi. Greater donor involvement is also necessary from the outset, given the smaller players in Malawi.

As indicated above, in addition to accurate information Zambia and Malawi also face challenges in extending access to information. Currently, the ZNFU disseminates information to farmers via SMS. However, this does not reach farmers who are not union members, and better government dissemination is needed. In Malawi, the nascent Africa Commodities Exchange (ACE) also provides price information. However, in both countries the uptake among and capability of farmers to effectively use this information is unclear, and there has not been extensive evaluation of the programmes.[44]

In Zambia and especially Malawi, creating a more open market information system is complicated by the large proportion of smallholders involved in commodity crops who often hold on to stocks that are not recorded. Informal cross-border trade adds another layer of complexity, as it is currently poorly understood and documented in Malawi and Zambia.[45] This highlights the increasingly important role of comprehensive crop estimates, and of working with institutions that monitor informal trade, such as the Famine Early Warning Systems Network (FEWS NET).[46]

In summary, Malawi and Zambia face similar challenges in market development. Given the smaller size of Malawi's soybean industry, the issues are more pronounced in Malawi. While targeting value chain issues from a marketing angle might seem premature, addressing these issues early on may actually kick-start the resolution of some of the value chain constraints in these countries (eg, unpredictable government policies, a small processing/trading sector, and smallholder constraints).

Top-down approaches to improve market linkages

Various 'top-down' interventions directly link producers to markets. These could be models to link farmers to traders, input suppliers, processors, government buyers, etc. These models are often formalised through contracts, but can also be informal. Such relationships can sometimes help to address many of the smallholder challenges indicated in previous sections (lack of certified seed, equipment, aggregation, etc.). One of the challenges with these smallholder linkage models is that bargaining power and control of the relationship lie with a few buyers, as many suppliers are competing for sales to a smaller amount of large buyers.[47] The following section will detail two examples of top-down market linkages involving soybean in Zambia and Malawi.

44 Malawi commodities exchange representative, *op. cit.*; Zambian industry association representative B, *op. cit.*

45 Malawi agricultural investor representative, *op. cit.*; Personal interview; Zambia donor representative B, Lusaka, 13 August 2017.

46 Malawi government official A, *op. cit.*; Malawi industry association representative A, *op. cit.*; Zambia donor representative B, *op. cit.*

47 Humphrey J & H Schmitz, *op. cit.*

Farm to table: The ETG model

One market linkage model that has been successful in the region is the one driven by the Kenyan agricultural Export Trading Group (ETG). While the operations of ETG in Africa are certainly not a new development (ETG has gradually been expanding its supply chain activities to 22 African countries), the model has had a big impact as a market for smallholders in Zambia and Malawi in particular. It is a good example of how smallholder producers can be linked profitably to end markets while also receiving good prices.

ETG's comprehensive model spans end-to-end supply chain activities, including procurement, input provision, warehousing, transport, processing and development of consumer products. It particularly seeks to integrate smallholders in difficult-to-access areas by establishing multiple procurement centres, where smallholders conduct informal cash sales and sell inputs. Its success is predicated on a number of factors, including the ability to lower costs through control of its own logistics networks and value chain activities, to create its own market information system through its branches in the region, and its longstanding relationships with the government (strengthened by its commitment to smallholders) and local companies. It also processes and sells a more innovative range of soy products beyond basic poultry feed and edible oil, such as textured soy protein and cereals comprised of corn and soy combinations, to satisfy low-cost consumer demand. While ETG is long established and its model may be difficult to replicate, it is an incredibly successful example of smallholder aggregation to efficiently process soybean domestically while also serving regional and international markets. ETG is able to grapple with some of the challenges in these countries (inputs, production efficiency, storage and marketing, logistics, market information) by supporting such activities internally.

Despite its robust system, issues such as market information still pose challenges. ETG could improve its proportion of regional trading (there is generally a regional price parity for soybean) over deep sea exports to countries with better market organisation and information. Stakeholder interviews also pointed out the difficulty of instituting a more formal contract-farming scheme in this model, owing to the frequency of side-selling, which ultimately provides less certainty for farmers. This issue is partially explored in Box 2.

The ETG example is important because it refutes a commonly held belief that smallholder models cannot be efficient and profitable.

Nascent commodities exchanges: Challenges and opportunities

Another way in which small farmers can be connected to markets is through commodities exchanges. Effective commodities exchanges can also help to target marketing information issues by offering fair prices to smallholders, and ultimately improve planning and predictability for value chain players through a centralised platform. Also important is their coordination with storage facilities, allowing smallholders to sell at good price levels, which is a major challenge for smallholders in Zambia and Malawi, especially given the volatility of soybean prices. The commodities exchange in South Africa, the South African Futures Exchange (SAFEX, which forms a part of the broader Johannesburg Stock

Exchange, or JSE), is an example of a well-functioning exchange and provides accurate price discovery, storage and futures hedging for commodities stakeholders.

Malawi has two commodities exchanges, ACE and Auction Holdings Commodities Exchange (AHCX). Currently they engage in spot trading, and legislation will reportedly soon be passed to allow the warehouse receipt system to function and be used formally as collateral by banks, allowing futures trading.[48] ACE is primarily backed by the donor community, while the AHCX is supported by the government. ACE is perhaps one of the most active exchanges in Southern Africa with a healthy amount of live trades.[49] However, a model where donors are key buyers is not sustainable in the long term, and the true test of the exchange will come when the private sector grows and takes the primary role.[50] As it stands, the competition arising from having two commodities exchanges is also not necessary in Malawi. This leads to struggles in aggregating volumes to be sufficiently liquid, and complicates the need for buy-in from the private sector, donors and the government. The role of NASFAM and/or aggregators is critical for ACE and the AHCX to operate smoothly. Without aggregation from NASFAM, listing on the exchange will not be profitable for small farmers. Even when farmers have aggregated, they still struggle with the interest rates for storage, which are extremely high in Malawi, and the exchange's inability to pay cash, which means they cannot receive proceeds immediately.[51] This is something that ACE is looking to change, to increase accessibility. The above challenges also disincentivise processors from listing, as volumes are not large enough for the exchange to be of much use.

The Zambian Commodity Exchange (ZAMACE) was technically established in 2007 but has only recently begun to see momentum, after its warehouse receipt (storage) activities were enabled by the Agricultural Credits Act in 2010. Given that Zambia has a commercial maize and soybean sector, there is greater potential for success in terms of sufficient volumes to support its operation. A number of the larger traders in Zambia have come on board with ZAMACE by offering storage facilities, including Afgri, ETG, Zdenake, NKW Agri and CHC Commodities. In 2016 the JSE and ZAMACE also reached an agreement that will allow Zambian grain contracts to be listed on SAFEX in order to enable futures trading. This will increase liquidity and market opportunities in the Zambian market. As is the case with ZAGIS, buy-in from the government is crucial to ZAMACE's success, and the indicated support from the Department of Agriculture and Finance is promising. While the passing of the Credit Act indicates government willingness to come on board, it is also essential that ZAMACE serve the interests of the broader public and the government, and not merely act as a traders' club. Currently, ZAMACE is seen to be in competition with the Food Reserve Agency (FRA, the government marketing body) and it is important to have the FRA use the exchange. Once government buy-in is understood to be not only

48 Malawian commodities exchange representative, *op. cit.*

49 Robbins P & Catholic Relief Services, 'Commodity Exchanges and Smallholders in Africa'. London: International Institute for Environment and Development/Sustainable Food Lab, 2011.

50 Zambian donor representative A, *op. cit.*

51 Malawi commodities exchange representative A, *op. cit.*; Malawi oilseed processing company representatives A & B, *op. cit.*

in principle but also in action, and the government's role in the commodities market scales down and/or becomes more predictable (which would be facilitated by the FRA's involvement), banks will have more confidence in backing the exchange. As it stands, banks are still concerned about the uncertain policy environment.[52] To begin to allay uncertainties and familiarise all stakeholders with ZAMACE, one stakeholder suggested a roadshow showcasing some live futures trades using SAFEX to kick-start the initiative.

For both these commodities exchanges to be successful, awareness and understanding is crucial. According to stakeholders in South Africa, even though SAFEX is sophisticated and well run, many farmers (even those whose operations are large scale and commercial) do not have a complete understanding of the mechanism. GrainSA offers educational/training courses for this purpose.[53] This issue is even more pronounced in Zambia and Malawi, where stakeholders are used to operating in a very controlled market. Especially in Zambia, where ZAMACE has not been fully functioning, stakeholders indicated that awareness and understanding was quite low.[54] Therefore, similar courses should be made available, along with promotional tools such as roadshows and live trades. This should also help in securing government support and participation in the exchanges. With the markets in Zambia and Malawi for the most part still too small to guarantee liquidity and effectiveness, it is important to ensure as much participation as possible. With the government on board, this also opens up options to impose requirements in terms of using the exchange, which has worked in other African countries, although this would conflict with the core market-driven mandate of commodities exchanges.

Box 2 provides an example of a multifaceted approach in Malawi to use commodity exchanges to target enhanced productivity and guaranteed markets, as well as the issue of side-selling.

These off-taker models can be supported by government through incentives that encourage new investment from processors, traders or input suppliers, and also by investing in supporting infrastructure for processing. With more efficient mechanisms for input support, such as the e-voucher in Zambia, more money should ideally be available for investment promotion. While the policy and donor focus on improving productivity is understandable in these countries, where there are still significant efficiency bottlenecks, this could benefit from a complementary focus on greater business linkages and support for off-takers to drive top-down efficiency. This is another area where lessons can be learned from South Africa, which has put in place several policy programmes to support large-scale investment with agro-processors and in turn promote their engagement with smallholders.[55]

52 Zambia commodities trading company representative C, *op. cit.*; Zambia industry association representative C, *op. cit.*

53 South African industry association representatives, *op. cit.*

54 Personal interview, Zambian researcher A, Lusaka, 11 September 2017; Zambia commodities trading company representative B, *op. cit.*; Zambia commodities trading company representative C, *op. cit.*

55 See Grain SA, 'Farmer development', http://www.grainsa.co.za/pages/farmer-development, accessed 17 August 2017.

BOX 2 MOST 'INCENTIVE BASED CONTRACT FARMING' IN MALAWI

In Malawi, the MOST programme is piloting an 'Incentive Based Contract Farming' (IBCF) model for soybean (and cotton) farmer–market linkages. This is an offshoot of traditional contract farming, as it seeks to lock in farmers and off-takers through incentives rather than contracts. MOST financially and technically supports one of the local commodities exchanges (ACE) to implement the programme.

In its pilot project, smallholder farmers with proven track records of selling commodities on ACE received pre-financing input packages (seed and inoculant) from ACE in order to encourage and increase soybean production. They paid back these costs through selling grain on ACE (almost all farmers also plant maize). While they are not obligated to sell their soybean through ACE, many farmers opt to do so based on their experiences of repaying maize through the exchange. While the expected rate of repayment had been 60%, 94% of farmers repaid in the first year. Payback was rewarded with larger pre-financing packages, so that farmers could expand production and increase efficiency, as well as with other incentives (such as insurance). Please note that all the footnotes in the box need to be listed under the text in the box itself.

The benefit for farmers is increased productivity and profit after they repay ACE, while buyers now have a much more stable supply when they consistently offer a fair market price, which acts as an incentive for fair pricing. There are still challenges, as at this point the programme has not yet become self-sufficient and ACE has not covered its operational costs, which MOST is subsidising. This is primarily owing to lower-than-expected production efficiency. Additionally, MOST is still underwriting risks for ACE. This nonetheless has been a promising model in its first few years, with the true test being the ability to wean off donor support in future.

Source: MOST, 'Malawi Oilseeds Sector Transformation Disrupting Market System Dynamics in Agriculture: Case Study'. Malawi: MOST, August 2017

POTENTIAL FOR REGIONAL VALUE CHAINS

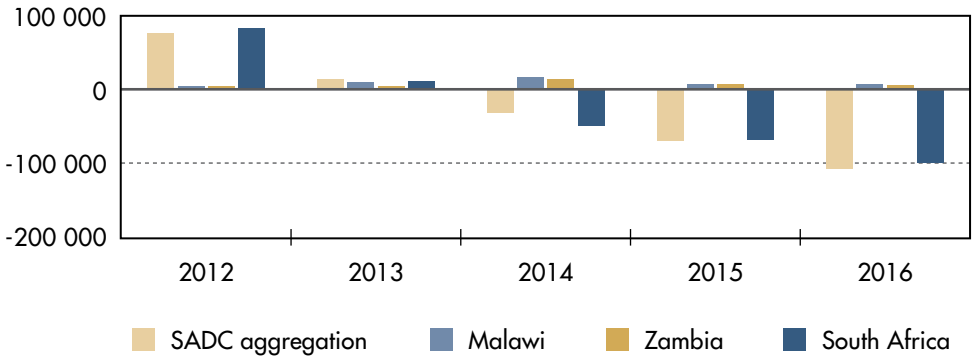
The SADC Regional Industrialisation Strategy and Roadmap places a strong emphasis on regional value chain development in priority industries, especially as a way in which to ensure a more even playing field, with more opportunities for domestic upgrading than linking directly to global value chains. Examining soybean value chains in three SADC countries raises the question whether there are opportunities for regional value chain development. In particular, the growth in soybean and soy cake production in countries such as Malawi and especially Zambia, coupled with the deficit in South Africa, has led to a South African policy interest/research agenda on the potential for greater regional

The lack of competitiveness in soybean production and marketing prevents significant sustainable exports. The linkages that do occur still often disadvantage smallholder farmers, who see very low margins

value chain development between South Africa and other soybean-producing countries.[56] A significant regional value chain already exists between Zambia and Zimbabwe, where much of Zambia's surplus soybean is exported (this relationship has, however, been negatively affected by arbitrary export bans in Zimbabwe).[57] Additionally, as mentioned earlier, Zambia has seen significant investment from South African companies along the poultry feed value chain, although these companies still primarily produce for the Zambian market.

However, it is also important to recognise that the lack of competitiveness in soybean production and marketing that has been explored throughout this paper prevents significant sustainable exports. The linkages that do occur still often disadvantage smallholder farmers, who see very low margins.[58] Thus the focus of these countries on domestic value chain constraints in the interim is justified. As indicated by figures 4 and 5, even if more cost competitive, the small surpluses in Malawi and Zambia would have little effect on the oilcake and soybean deficit in South Africa, let alone in terms of major global production.

FIGURE 4 SOYBEAN TRADE BALANCE



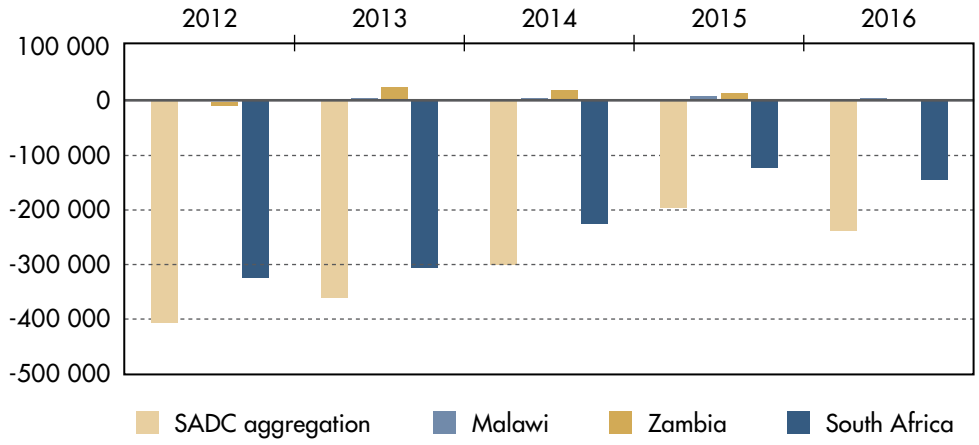
Source: Statistics derived from ITC (International Trade Centre), 'Trademap', 5 October 2017, https://www.trademap.org/Index.aspx?AspxAutoDetectCookieSupport=1, accessed 15 August 2017

56 Ncube P, Roberts S & T Zengeni, 'Development of the Animal Feed to Poultry Value Chain across Botswana, South Africa, and Zimbabwe', UNU Wider Working Paper. Helsinki: UNU-WIDER, February 2016.

57 Zambian oilseed processing company representative A, *op. cit.*; Zambian commodities trading company B, *op. cit.*

58 Malawi oilseed processing company representatives A and B, *op. cit.*

FIGURE 5 SOY CAKE TRADE BALANCE



Source: Statistics derived from ITC, 'Trademap', 5 October 2017, https://www.trademap.org/Index.aspx?AspxAutoDetectCookieSupport=1, accessed 15 August 2017

However, this paper also identifies areas for greater regional collaboration on best practices that have been adopted by SADC countries, as well as research and development as a starting point for SADC in its regional agricultural development strategy. The South African private sector is seeking to further drive this process through an initiative called the Southern African Grain Network (SAGNET). SAGNET's primary objectives are threefold: policy advocacy, capacity strengthening and market information. The aforementioned difficulties in developing SADC countries' own market information systems and commodities exchanges must be acknowledged, and will likely make prospects of effective regional market coordination premature at this point. Currently, SAGNET could better serve as a space to address its two other objectives: capacity strengthening and policy advocacy. SAGNET should work with institutions such as the Regional Network of Agricultural Policy Research Institutes (ReNAPRI, which comprises research institutes from across Southern Africa) to serve as a space for collaboration on issues such as production research and development, SADC seed trade, and government policies. Research and development initiatives could especially benefit from developing programmes at university/vocational levels. SAGNET could also facilitate the sharing of policy and programme best practices.

Looking to the future, as domestic soybean value chains develop further in SADC and producers increase their profit margins, there will be a need to focus on regional complementarities in order to create true regional value chains with competitive advantages. Countries such as Malawi and Zambia have prioritised soybean production and seen productivity increases; however, this does not mean that every country in the region should focus on this crop. This is an area where SADC could work with member countries to achieve a more effective regional focus and specialisation. Currently, the

SADC Regional Industrialisation Strategy Action Plan lists a wide range of countries with oilseed as a priority crop. This could have been approached more methodically based on competitive advantage and policy focus. It also requires a willingness to give up certain processes within the value chain from countries (the biggest example being South Africa) whose policies support the concept of regional value chains while seeking to promote self-sufficiency along the whole value chain. This will remain a persistent challenge in the region.

KEY TAKEAWAYS

The case for cross-country comparison

The analysis of Zambia, Malawi and, to a lesser extent, South Africa in this paper provides a comparative perspective of three SADC countries that have seen growth and/or active policy promotion of soybean value chains. The industries in the three countries are at three different stages of development.

South Africa's mechanised production and organised grain and oilseed markets have allowed a highly sophisticated industry. Despite small surpluses in both Zambia and Malawi, the industries in both countries are still small when compared to that of South Africa (let alone globally) and face challenges in growing meaningfully, owing to inefficient production by most smallholders and underdeveloped market systems. Zambia's soybean industry has seen growth resulting from increased poultry demand and South African investment, but still faces challenges in sophisticated production and marketing, as well as in edible oil production. Malawi's industry is hampered by difficulties in the investment environment such as ability to purchase land, interest rates and costs of utilities, which prevent significant foreign investment in processing. These dynamics create a key distinction between the two countries: there is still a large donor presence in Malawi's soybean industry, while in Zambia's industry top-down investment from traders and processors is beginning to take root. However, both countries face challenges in input provision, production and marketing that hamper overall value chain development.

An integrated approach to policy and programme interventions

Despite the differences between countries, this paper demonstrates that there are also commonalities that allow for universal takeaways to help link soybean producers to markets. Perhaps the most important takeaway is that there is a need for integrated approaches to tackling producer constraints.

The need for integration firstly applies to the analysis of bottlenecks along the value chain, which are interrelated and affect each other. For example, the regulatory challenges in edible oil production (corruption and cheap imports) increase the costs of producing soybean cake and decrease the overall competitiveness of the soy cake/feed value chain. Addressing policies on VAT and border corruption will therefore increase overall soybean competitiveness. It is important that there is a united push from industry associations, civil society and champions within government to address these issues.

Additionally, the continued reliance on government support for soybean inputs limits the funding available for equipment and technical support to mechanise soybean production, which would ultimately allow decreased costs and greater self-sufficiency. Therefore the interventions mentioned to improve the FISPs are crucial, and focus must be placed on achieving a balance between support for inputs and support for mechanisation, which can be assisted by a supportive environment for investment from off-takers.

Also, lack of scale and mechanisation in soybean production is one of the key bottlenecks that have prevented the nascent commodities exchanges from functioning optimally, as they require larger volumes. Targeting inefficiencies in production and input provision would assist in boosting volumes on the struggling exchanges. Addressing these dynamics holistically would improve the ability to target them appropriately, ultimately increasing producers' ability to connect to processing and export opportunities.

Secondly, both 'top-down' and 'bottom-up' approaches are needed. For example, driving top-down buyer–producer linkages can help alleviate some of the financial constraints faced by government and industry extension programmes, as buyers are inclined to provide quality inputs, aggregate, etc. At the same time, bottom-up interventions such as organised markets and market information are needed to improve the climate for buyers to invest in developing countries.

Thirdly, there is a need for integration between government, private sector and donors in targeting these bottlenecks. Commodity exchanges and market information systems will not function effectively without buy-in from government and the willingness to engage more predictably in the market and involve its own marketing bodies. Donor interventions such as MOST's IBCF and inoculant programme rely on the private sector to eventually grow into sustainable initiatives, but are necessary to provide start-up capital and risk reduction. The government's role is still necessary in subsidising inputs for the majority of the rural poor, who will not be served by a purely market-based system at this point in time. Such interventions can also integrate private sector providers through efficient means such as the e-voucher in Zambia.

Commodity exchanges and market information systems will not function effectively without buy-in from government and the willingness to engage more predictably in the market and involve its own marketing bodies

Lastly, there is a strong case for regional collaboration and information sharing on specific policies and approaches to support soybean. Regional institutions such as ReNAPRI (from a research angle) and SAGNET (from a private sector coordination angle) are invaluable actors in facilitating these exchanges.

Country interventions

Policies and support programmes to target domestic issues in areas such as seed and other inputs, production efficiency and market organisation, ultimately help to attract off-taking from processors and traders, which further increases value chain efficiencies. This paper examined key interventions in these areas, which can be used as lessons across countries despite the different stages of their industries.

Bottom-up initiatives

In Malawi, the MOST-supported programme to introduce a private sector actor to provide inoculant has had a big impact on productivity and access for small farmers. Countries such as Zambia could explore similar options, as Zambia has seen an influx of small farmers into soybean production who have low margins and do not use inoculant.

Zambia's ZNFU-driven e-voucher system has made inroads in decreasing corruption and red tape in input provision, allowing greater reach into rural areas as well as diversified options for farmers, while still offering much-needed subsidies. This programme can assist in freeing space for other needs, such as extension (equipment, training, irrigation, etc.). It also provides an opportunity for cross-country learning, especially as the impacts of digitalisation on agriculture are fast approaching and SADC countries would benefit from early adoption.

This paper has also demonstrated the need for better marketing information, so that all actors along the value chain can receive fair prices and market their products effectively. While Zambia has limited grain and oilseed market organisation, in Malawi no established formal structures are in place. Initiatives such as the USAID Trade Hub's market information systems are therefore important, and lessons can be taken from Zambia's more advanced intervention for the process currently underway in Malawi, such as the need for a champion and an independent institution.

Top-down initiatives

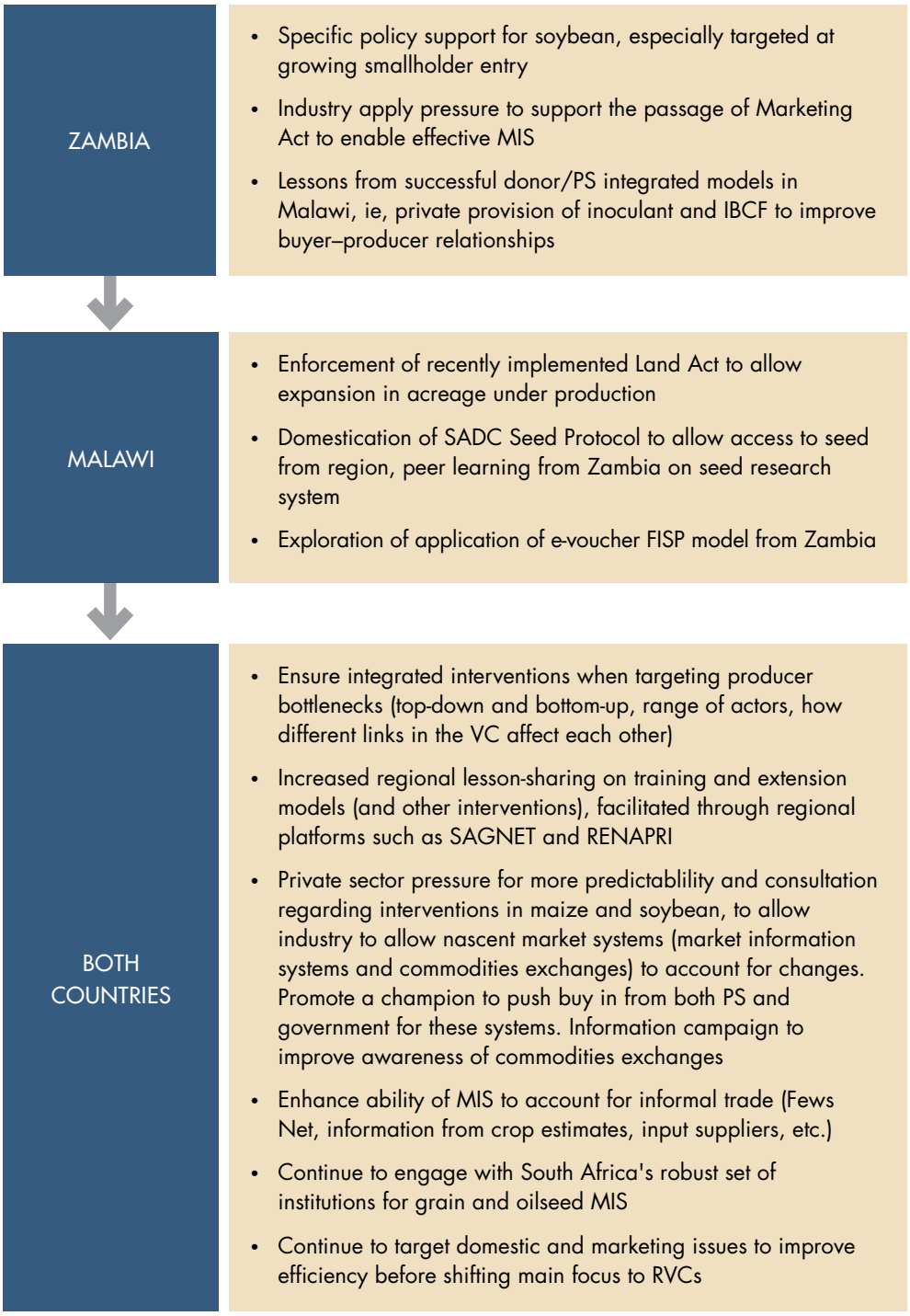
Limited funds for extension and ineffective programming still present major hurdles for most small farmers in Zambia and Malawi. Contract farming off-taker programmes are important mechanisms to drive top-down efficiencies by linking buyers and farmers. It is important that off-taker programmes provide opportunities for small farmers to scale up, as is the case with the MOST-funded and ACE-run incentive-based contract-farming programme in Malawi. The incentivising components of those models could be an important addition to many contract-farming models in the region. In a country such as Zambia, an IBCF model may even be better able to sustain itself in the absence of donor support. While adherence to the ICBF model in Malawi was a success, one of the challenges was finding effective methods for extension, as farmer productivity remained low. This affected cost-recovery. There could be an opportunity for cross-country learning from South Africa's smallholder development programmes, which have benefitted from high levels of interactivity with farmers, mentorship and business planning, extending beyond general information provision. In general, the difficulties of effective extension should be a key area for regional collaboration and lesson sharing, as a range of (often uncoordinated) interventions is often piloted across multiple countries in the region.

ETG's model for smallholder development is unique in the region and proves that smallholders can profitably serve domestic and global markets while continually increasing their efficiency. The governments of Malawi and Zambia should further examine this model to support other investors catering to smallholders, through mechanisms such as rural penetration and collection points, in-house storage and logistics, etc.

Effective commodities exchanges will contribute to the above-mentioned market information, in addition to providing consistent markets and fair prices for smallholders. However, these efforts will only be effective with the private sector and government's united buy-in and willingness to provide information. While erratic government interventions will complicate these mechanisms, government involvement and support is crucial to pass the necessary legal frameworks for such a system and actively participate in trades. Once a champion is established, the first priority should be to develop more detailed government engagement strategies. Encouraging more predictability in government interventions will help market actors to prepare and adjust. While commodities exchanges can prove invaluable in assisting with both marketing and storage, it is also essential that they are adapted for smallholders, and can offer options for aggregation and affordable cash payments. In countries such as Malawi and Zambia where much trade is informal, systems must also be developed to account for these stocks and transactions. The role of institutions such as FEWS NET that monitor informal trade is important, as are other mechanisms to calculate smallholder stocks (given that visiting every smallholder is not feasible). These include crop estimates and the triangulation of information from other actors working with smallholders, such as input suppliers and local traders.

Figure 6 (see page 34) lists more specific recommendations to target producer challenges in the case study countries.

FIGURE 6 COUNTRY-SPECIFIC RECOMMENDATIONS



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