



Oxford Policy Management



# **Smallholder Risk Management Solutions (SRMS) in Malawi and Ethiopia**

Value Chain Study and Design of a Replicable  
Business Model in Phalombe District,  
Southern Region of Malawi

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The Sustainable Intensification of Agricultural Research and Learning in Africa (SAIRLA) Programme is a UK Department for International Development-funded initiative that seeks to generate evidence and design tools to enable governments, investors and other key actors to deliver more effective policies and investments in sustainable agricultural intensification that strengthen the capacity of poorer farmers', especially women and youth, to access and benefit from SAI in Burkina Faso, Ethiopia, Ghana, Malawi, Tanzania and Zambia.

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## List of abbreviations

ACE	Agriculture Commodity Exchange
ADD	Agricultural Development District
DADO	District Agriculture Development Officer
DFID	Department for International Development (UK)
EPA	Extension Planning Area
FAO	Food and Agriculture Organization
FGD	Focus group discussion
FUM	Farmers' Union of Malawi
GIZ	Die Deutsche Gesellschaft für Internationale Zusammenarbeit
Ha	Hectare
INR	Indian Rupee
IPGA	India Pulses and Grains Association
KIS	Key identified stakeholders
LDF	Local Development Fund
M4P	Making Markets Work for the poor
MCCCI	Malawi Confederation of Chambers of Commerce and Industry
MT	Metric Ton
MISST	Malawi Improved Seed Systems and Technologies
MWK	Malawian Kwacha
NASFAM	National Smallholder Farmers Association of Malawi
NGOs	Non-governmental organisations
OPM	Oxford Policy Management
SADC	South African Development Community
SAIRLA	Sustainable Agricultural Intensification Research and Learning in Africa
SRMS	Smallholder Risk Management Solutions
USD	United States Dollar
VCD	Value chain development
WRS	Warehouse Receipt System

## Introduction

Sustainable Agricultural Intensification Research and Learning in Africa (SAIRLA) is a five-year programme (2016 to 2020) funded by the UK Department for International Development (DFID). SAIRLA finances eight research projects in six countries (Burkina Faso, Ethiopia, Ghana, Malawi, Tanzania and Zambia), as well as a Learning Alliance that operates at international, regional and national levels. The SAIRLA research projects aim to generate new evidence and decision-support tools for decision-makers, to help create an enabling environment for poorer African smallholder farmers, especially youth and women, to benefit from sustainable intensification.

The Smallholder Risk Management Solutions (SRMS) project is part of the SAIRLA programme and is implemented in Malawi and Ethiopia by a consortium led by Oxford Policy Management (OPM). The SRMS project aims to investigate the key risk factors that smallholders face in sustainable agricultural intensification and to explore risk management strategies that can be put in place to manage them. The research activities of the SRMS project are being implemented in two workstreams, which aim to (1) develop and test innovative risk management strategies and (2) design a 'replicable business model' in both countries.

This study builds on the findings of the SRMS Scoping Study, which was the first research output of the SRMS project, was completed in February 2017 (OPM *et al.*, 2017). Based on a thorough investigation of the agricultural and marketing systems in the research countries, the Scoping Study selected *teff* and *pigeon pea* as two entry points through which to investigate risk management strategies in Ethiopia and Malawi, respectively. The purpose of this report is to develop a 'replicable business model' for pigeon pea in Malawi that reduces the risks that smallholders are exposed to in producing and marketing pigeon pea.

This report is divided into four chapters. The first chapter discusses the methodology and the data collection methods which were used to select the research area and to design a replicable business model for the selected farmers' cooperative. The second chapter investigates the pigeon pea value chain in Malawi, focusing on the characteristics of the market and describing the main stakeholders. The third chapter introduces the research area, and in particular the Sukamphete Pigeon Pea Farmers' Cooperative, with whom the project will work in the future. The replicable business model is presented in the final chapter of this study, along with the proposed modality for implementing the model.

# 1 Key concepts and research methods

This chapter discusses the conceptual and methodological aspects of the study. The chapter begins by conceptualising smallholder risk and risk management strategies. This is followed by a description of the concept of a ‘replicable business model’, as outlined in the project technical proposal and made specific to pigeon pea trade in Malawi. The chapter then describes the ‘value chain’ approach which is used to explore and understand the characteristics of the pigeon pea marketing and production system in Malawi. The third section describes the methods which were used to collect and collate information for this study – focusing on the (type of) literature reviewed, interviews conducted and data analysed.

## 1.1 Conceptualising smallholder risk and risk management strategies

The analytical framework to investigate risk management strategies for smallholders was developed in the SRMS Scoping Study (OPM *et al.*, 2017). Based on a literature review and on interviews with stakeholders, the Scoping Study identified four systemic risks along smallholder value chains: natural shocks; prices; economic coordination; and opportunism. The study further identified potential risk management strategies for each systemic risk along the pigeon pea value chain in Malawi. The table below shows the systemic risks and their associated risk management strategies as identified by the SRMS Scoping Study.

**Table 1: Systemic risks and proposed risk management strategies**

Systemic risk	Proposed risk management strategy
Natural shocks	Planting varieties with a range of field durations
	Nyonga packs for crop protection
	Improved varieties
Price risks	No strategy proposed
Economic coordination risks	Increase seed supply of seed varieties
	Improve flow of information about seed varieties
	Collective marketing
Risk of opportunism	Forward contracting

Source: OPM *et al.* (2017).

This study provides a contextualised description of the risk environment in the selected study areas. Chapter 3.1 discusses the relevance of each systemic risk in the selected village and Chapter 4.4 discusses the ways through which the proposed replicable business model is expected to reinforce existing risk management strategies that are employed by smallholders in the selected study areas.

## 1.2 The concept of a ‘replicable business model’

The underlying objective of the SRMS project is to provide strategies to manage risks faced by smallholders – including price risks, coordination risks and risks of opportunism. A ‘business model’ that aims to serve this purpose and that at the same time aspires to be replicable needs to fulfil several criteria (OPM *et al.*, 2016): it needs to be inclusive, to address systemic risks that hinder commercialisation, and to connect the value chain actors effectively through collective marketing and (if possible) forward contracting. The different value chain actors that participate in any business model include *input suppliers* (agro-dealers, public-sector seed suppliers), *farmers*

(marketing groups/cooperatives), *buyers* (local traders or a private company) and *processors* (millers, export traders).

A well-designed replicable business model must be demand-driven and must provide an economic incentive to all actors in the value chain to cooperate and make the model work. The design will be based on a diagnostic value chain analysis which investigates the key opportunities and constraints on current performance, explores ways to improve coordination between the value chain actors, and describes the characteristics of input markets and the various incentives of technology adoption. The ultimate purpose of a replicable business model is to provide an action plan that coordinates input supply, smallholder marketing, and buyers' needs, as well as quantities and price incentives for the key value chain actors. The business plan needs to assign clear roles to each of the relevant value chain actors. The SRMS project will then act as a *broker* (but not as a guarantor) to bring stakeholders together, ensure that the different actors perform their agreed roles and meet their responsibilities, and will ultimately test the model over two crop seasons by documenting the performance of the model and evaluating its effectiveness in managing systemic risks. This will generate key lessons that the project will communicate to policy-makers.

As free markets are often unpredictable and it is not possible during the design of the model to foresee how markets will perform in the future, there is, clearly, no guarantee that the model will indeed continue to be relevant and to work in several years' time. It is likely that the model will require some adjustment over its course of implementation, which will be the subject of the action-research phase of the SRMS project. If, at the end, the model is proved to be successful, it can be replicated and scaled up at country level and to other value chains.

The SRMS project will not itself try to replicate or scale up the replicable business model. The purpose of the project is to generate research evidence on replicable business models and to provide lessons for policy-makers that can be used to design development projects.

### 1.3 The value chain approach

According to a widely-quoted description, value chains are 'socioeconomic systems that include all enterprises cooperating to serve a particular market' (Springer-Heinze, 2017). These enterprises interact and cooperate constantly to pursue shared interests (including buying and selling products and services, as well as exchanging information) and they belong to a wider value chain community that consists of private associations, specialised service providers and industry-specific public organisations that provide support.

One way to improve, develop and make value chains pro-poor is to 'strengthen mutually beneficial linkages among firms so that they work together to take advantage of market opportunities, that is, to create and build trust among value chain participants' (World Bank, 2010). It is commonly accepted that the inclusion of smallholder farmers and other vulnerable populations in value chain development (VCD) leads to inclusive and pro-poor value chains – which is our ultimate goal in this case study.

Over the past decade, several methodologies have been developed by different organisations to investigate and develop value chains. They include the United Nations Food and Agriculture Organization's (FAO's) 'Guidelines for rapid appraisal of agrifood chain performance in developing countries', the 'Making Markets work for the Poor' (M4P) approach, as well as the ValueLinks method developed by Die Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), among others (FAO, 2007; DFID, 2008; GIZ, 2008).<sup>1</sup> This study uses the **ValueLinks** method, which has

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<sup>1</sup> For a comparative review of guides for value chain analysis and development see Donovan, J., 2013.



several favourable characteristics that make it an appropriate methodological tool for designing a replicable business model.

The ValueLinks method ‘stands out for the depth in which it covers a range of important issues affecting VCD, including value chain mapping, value chain implementation, assessment of the business environment and facilitating services and monitoring and evaluation of VCD-related interventions’ (Donovan, J. 2013). This method looks simultaneously at interventions, investments and policy support networks, which are coordinated (and where necessary discussed) with the relevant stakeholders. This approach investigates the *overall* characteristics of the entire value chain, explores the links among the different actors and service providers, and identifies common challenges by looking at the value chain in a holistic manner. The ValueLinks method therefore provides useful insight when designing development interventions.

In order to design a viable business model and to improve and develop value chains in a sustainable manner, it is necessary to develop a clear understanding of the characteristics of the existing value chain – this is discussed in Chapter 2 of this study.

## 1.4 Data and information collection for this study

This study builds on the Scoping Study, which was completed for the SRMS project in February 2017 (OPM *et al.*, 2017). A substantial amount of research was conducted for the Scoping Study, which selected pigeon pea as the entry point for the value chain study and the design of the replicable business model in Malawi (as well as for the SRMS project). The Scoping Study interviewed 28 key stakeholders in Malawi, who were selected from a range of government organisations, non-governmental organisations (NGOs) and business actors, including seed companies, traders and input suppliers (for a detailed list of the interviews conducted see OPM *et al.*, 2017: 50). The specific objective of the Scoping Study, however, was not to explore in detail the characteristics of the pigeon pea value chain in Malawi, but rather to select and narrow down the subject of the research on SRMS in both Malawi and in Ethiopia. This study, while building on the findings of the Scoping Study, focuses specifically on the pigeon pea value chain in Malawi.

The value chain study started off with a detailed review of the most recent and relevant literature on the characteristics of the pigeon pea value chain in Malawi. The specific aspects of the literature that were reviewed in detail included the characteristics of the national and international markets (including Malawi’s connections to the Indian export market), the relative importance of pigeon pea in local consumption and marketing, and the characteristics and economic incentives of the main stakeholders in the pigeon pea value chain in Malawi. Since many of these aspects are well understood and documented in the literature, the purpose of this study was not to conduct further research on the specific aspects of the *national*-level value chain, nor to challenge the findings of other national-level studies: rather, the literature review provided a useful entry point through which to analyse the *local* pigeon pea value chain within the selected project area, and to explore the functioning of the pigeon pea value chain from the point of view of the individual farmers.

Following the literature review, two fieldwork practicums were completed in July and in September 2017, by Joachim Weber (work-stream leader) and Zoltan Tiba (project leader).<sup>2</sup> During the two visits the research team collected information from a variety of sources:

- a total of 34 key stakeholders were interviewed;
- four focus group discussions (FGDs) were held with different farmers’ cooperatives in Blantyre Agriculture Development District (ADD);

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<sup>2</sup> The first trip was conducted between 1 and 9 July and the second trip between 3 and 11 September 2017.

- two warehouses were visited in Phalombe District and in Mulanje District;
- seven different trading outlets were visited, where prices were collected and traders were interviewed;
- in-depth interviews were conducted with two farmers in Mulanje District and their farming practices and level of pigeon pea harvest were assessed;
- one value chain stakeholder workshop was held in Phalombe District with the selected farmer organisation; and
- six individuals were further interviewed over the phone or by email.

The key stakeholders who were interviewed for this study were selected carefully. While the SRMS Scoping Study interviewed a broad set of stakeholders based both in Lilongwe and in Blantyre, the majority of the stakeholders interviewed for the value chain study were based in the project area in the Southern Region: in particular, in Mulanje and Phalombe districts, which were identified by the Scoping Study for further investigation. As the ultimate purpose of this study was to select a farmer organisation with whom the business model would be tested, the local-specific information about the project area could only be collected in the project area.

The interviewed stakeholders included **business actors** (the major pigeon pea traders and input suppliers in Blantyre), **government organisations** (seed inspectors at Bvumbwe agricultural research station; staff at Phalombe and Machinga District Agricultural Development Offices; staff (managers, agribusiness and crop officers at Blantyre ADD), **farmers' organisations** (the Nandolo Farmers' Association of Malawi; the National Smallholder Farmers Association of Malawi (NASFAM); the Farmers Union of Malawi (FUM)); Farmer's World); agricultural projects (Malawi Improved Seed Systems and Technologies (MISST) project), the Malawi Bureau of Standards, and a variety of international organisations, including the World Food Programme and Christian Aid.

The research team also visited at least seven **retail outlets** (Shoprite, Peoples' Trading Centre) and interviewed **local traders** near the project area to collect local prices of raw and processed pigeon pea (in addition to other pulses) and to check the availability and quality in the local markets. At least seven different markets were visited in Mulanje and Phalombe districts, where local traders were interviewed. In addition, two warehouses were visited in Mulanje and Phalombe districts.

During the fieldwork practicums, four **FGDs** were conducted with farmer producer organisations, including Namulenga Producers and Marketing Cooperative Society (Nkando Village, Tuchila Extension Planning Area – EPA, Mulanje District), Ndanga Village Cooperative (Mulomba EPA, Mulanje District) and Sukamphete Cooperative (Chitekeza Village, Tamania EPA, Phalombe District).

Following the ValueLinks methodology a **stakeholder workshop** was held with the selected farmer's cooperative. The workshop took place on 08 September 2017, during which the characteristics of the replicable business model were developed in close collaboration with the local stakeholders (see Chapters 3 and 4 for more details).

The research team also visited and interviewed **two pigeon pea farmers** in Ndanga Village (Mulomba EPA, Mulanje District), with whom detailed interviews were conducted to explore their pigeon pea production practices. The area of production was measured using a GPS device and the data were used to calculate the farmers' gross margins of production. These calculations are summarised in Annex D.

Figure 1 below shows the itinerary of the research team during the fieldwork in July and in September 2017, and Annex A gives a list of the interviews conducted with the relevant stakeholders.

**Figure 1: Field visits in July and September 2017 and selection of Sukamphete Cooperative.**



All interviews for this study were conducted by using a semi-structured questionnaire (see Annex C). Each interview started with a detailed explanation of the purposes of the research project, after which the respondents were encouraged to express freely their views and opinions about the status of pigeon pea production and trade in Malawi. As opposed to approaching stakeholders with a predefined and set questionnaire, the ValueLinks method allowed a significant amount of flexibility for the interviewees to express their views in a participatory manner. Through this method it became possible to explore the areas and aspects of the pigeon pea value chain which would not have been brought to light if a predefined (and rigid) questionnaire had been used. On average, each interview lasted for at least an hour and in all cases a good relationship was developed with the interviewees. Some of the stakeholders interviewed were selected as the key identified stakeholders (KISs) of the SRMS project.<sup>3</sup>

The different sources of information collected from the literature review and during the fieldwork practicums were triangulated by the research team to select an area and to identify a farmers' cooperative which had the willingness and the capability to participate in a business model and to become a reliable actor in the pigeon pea value chain.

<sup>3</sup> The SAIRLA Programme (and the SRMS project) aims to influence a set of KISs in both policy and in business to change their attitude towards smallholder risk management strategies (SRMS). The SRMS project will maintain a close relationship with its selected KISs over the course of its implementation. The SRMS Monitoring and Evaluation Plan discusses in detail the role of the KISs for the project (OPM, 22 February 2017).

## 2 Analysis of the pigeon pea value chain in Malawi

This chapter provides an analysis of the characteristics of the pigeon pea value chain in Malawi. It is important to clarify at least two aspects of this study, before moving on to the analysis. First, the purpose of the subsequent value chain analysis is to provide a basis for the design of the replicable business model, which will be tested with the selected farmer's cooperative. While this chapter looks at all relevant aspects of the value chain which are important for the design of the business model, it does not aim to dig deeper into the characteristics of the value chain than what is required for an effective business model to function. This study is therefore **not** meant to be a national-level and comprehensive analysis of all actors in the chain and the purpose of the analysis is not to offer models to change the business environment or the motives of the value chain actors at the national level. Several other recent studies have provided a more detailed analysis of the pigeon pea value chain in Malawi, which this study also refers to (Simtowe *et al.*, 2011; Waldmann *et al.*, 2017; BIF, 2014).

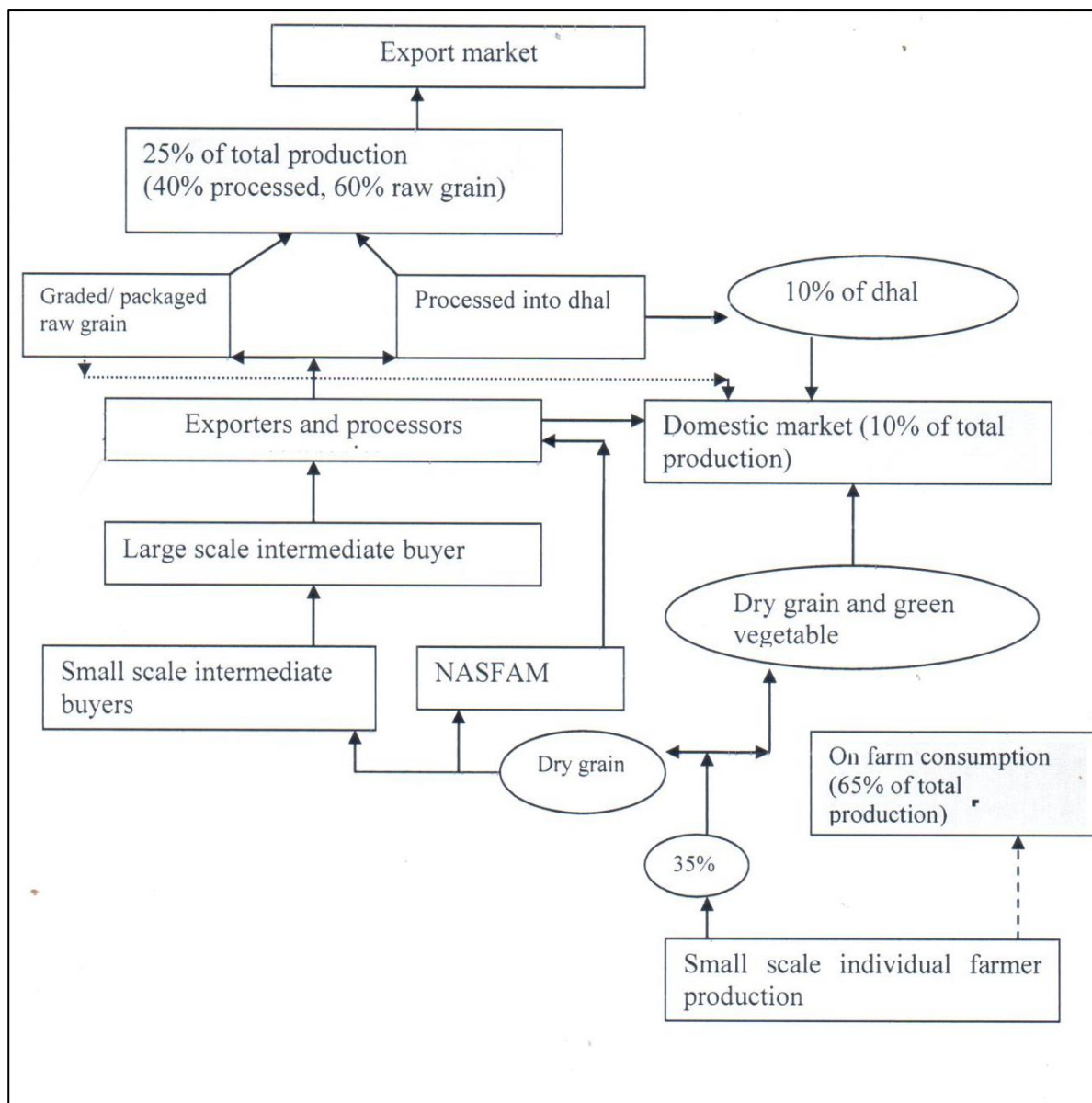
Second, the description of the pigeon pea value chain and the findings of this chapter are relevant as at September 2017. Value chains do not operate in a vacuum – they are dynamic systems driven by the market and by changes in demand and prices, which impact the value chain upgrading interventions and the business model. Even within the course of the SRMS project, significant changes have happened in the pigeon pea market, between the publication of the Scoping Study in February 2017 (OPM *et al.* 2017) and this report in September 2017. When pigeon pea was selected as an SRMS crop for this study by the inception report, the export price for Malawi pigeon pea was around US\$600 per metric ton (MT) and demand was high. At the time of design of the replicable business model the price is currently below US\$300/MT and there is hardly any market demand for pigeon pea. At the time of writing, it is not known how the business environment is going to develop in the coming months (and years), although the replicable business model (developed based on the value chain analysis) uses certain assumptions related to the future functioning of the market. These assumptions will need to be revisited and possibly revised as the research project proceeds.

This chapter is divided into two sections. The first section describes the current characteristics of the pigeon pea **market** in Malawi, focusing on the local and on the international (export) markets. The second section describes the main **stakeholders** in the value chain, including farmers, farmer organisations, exporters, processors and the Agricultural Commodity Exchange (ACE).

### 2.1 Market analysis

The pigeon pea market can be differentiated into two segments, including the local and the export market. A brief description of each segment and the implications for trade are given below. None of these market segments are currently offering quality-related price differentiation at the farm gate level. According to interviews with farmers and traders, farmers do not receive higher farm gate prices for white pigeon pea, which has a price differential of about US\$50/MT in the world market.

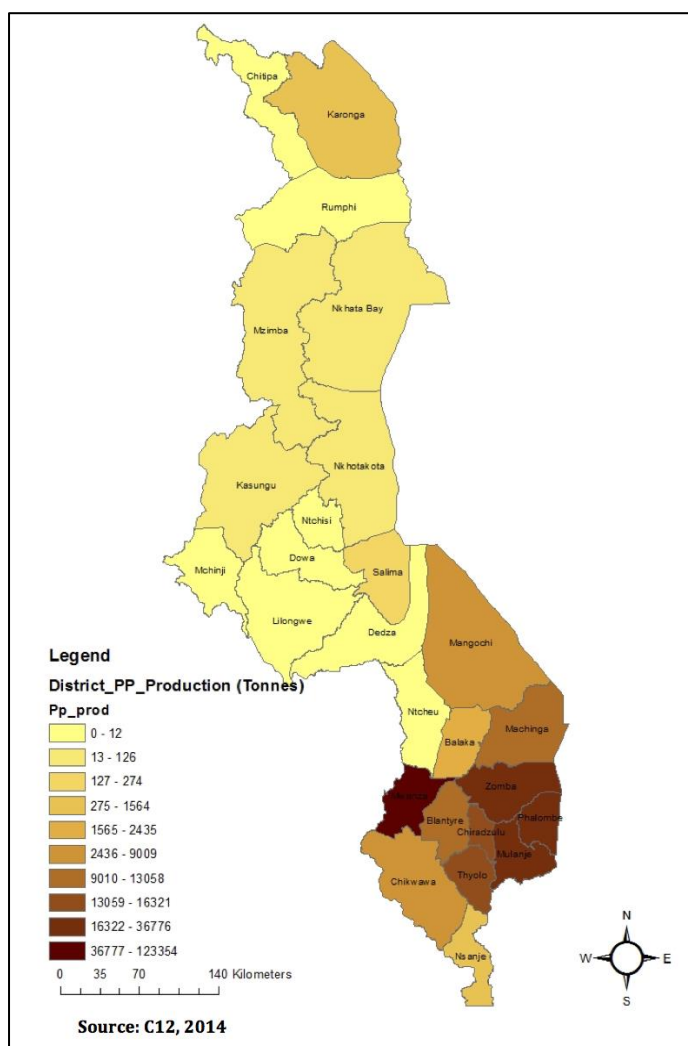
**Figure 2: The pigeon pea value chain**



Source: Adjusted from Simtowe *et al.*, 2011

### 2.1.1 The characteristics of the local market

Production and consumption of pigeon pea is concentrated in the Southern Region of Malawi, where 97% of national production is harvested (Dzanja, 2016). In Malawi, about 75% of the national production of pigeon pea is consumed within the country (BIF, 2014) and around 65% of the total production of pigeon pea is produced for subsistence and consumed directly on the farm (Simtowe *et al.*, 2011). Local consumption is concentrated in the south, while pigeon pea is rarely consumed in the Central and in the Northern Regions of the country. It is estimated that the demand for pigeon pea for local consumption will increase at a rate of 3.1% to 5.2% between 2010 and 2025 (Dzanja, 2016). Pigeon pea for local consumption in the south is sourced from local markets and consists mainly of fresh and dried pigeon pea. On the other hand, pigeon pea for local consumption in the Northern and Central Regions also includes packed, dried, whole and processed pigeon pea sourced from retailers and supermarkets. According to interviews with a processor in September 2017, the total annual volume of processed pigeon pea consumed in Malawi is around 250 MT.

**Figure 3: Pigeon pea production areas in Malawi**

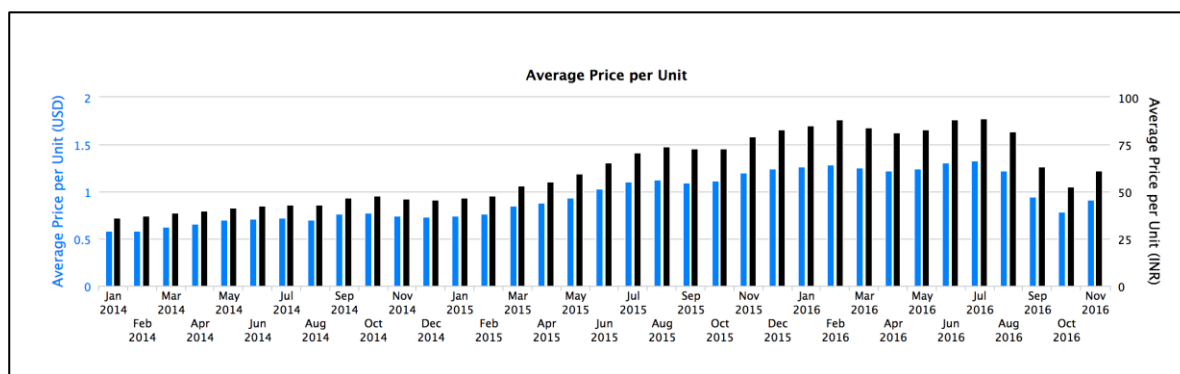
### 2.1.2 The characteristics of the export market

In 2015 India accounted for 68% of the world production of pigeon pea: 5,361 thousand metric tonnes (IndexBox, 2017). Today India accounts for 82% of the global pigeon pea production (India Pulses and Grains Association (IPGA), 2017). Malawi produced 373,000MT in 2015, which represents 7% of world production (IndexBox, 2017). The average annual growth rate of global production between 2007 and 2015 was 5.4%, while at the same time the growth rate for Malawi was 11.6% per year, (IndexBox, 2017). Malawi exports on average 25% of national production (Simtowe *et al.*, 2011), in the form of whole dry pigeon pea and processed pigeon pea (dhal). India imports about half of the world pulses trade, (IPGA, 2017). India is also the most important destination for pigeon pea from Malawi. In 2016, the value of pigeon pea exported to India according to TradeMap was US\$39.4 million, reflecting more than 90% of the Malawi pigeon pea export value. Pigeon pea prices in Malawi are strongly affected by the prices in the world market as more than 70% of marketed pigeon peas in Malawi are exported. Low demand and low world market prices directly result in low farm gate prices in Malawi, as there are very limited alternative marketing options. Additionally, Malawi, as a land-locked country, has to absorb at least US\$100/MT to cover the additional transport cost to the nearest port of export (Beira). As Malawi competes with Tanzania and Kenya, this results in lower farm gate prices in Malawi (OPM *et al.*, 2017).

All countries producing pigeon pea depend on the market situation in India: high demand in India creates high world market prices, low demand in India creates oversupply in world trade. In 2014, India experienced a below average production, while in 2015 production further declined because of extreme weather conditions. In 2015, this resulted in record import prices (US\$1,120/MT) in India (OPM *et al.*, 2017). Farm gate prices in Malawi followed this trend and in 2015 farmers enjoyed up to a Malawian Kwacha (MWK) 900 per kg (US\$786/MT) farm gate price (OPM *et al.*, 2017). In July 2016, import prices peaked at US\$1,330/MT but then fell to US\$779/MT in October 2016 as the harvest estimates for Indian pigeon pea production were revised upwards (Zauba, 2017). At this time, many importers in India renegotiated their contracts and managed to get substantially lower prices. In July 2016, Malawi pigeon pea trade started with MWK 500 per kg (US\$556/MT) and many farmers and their organisations expected the prices to further increase later in the season. However, because of limited demand from India, the purchase season for Malawi pigeon peas closed at MWK 200 per kg (US\$270/MT) in December 2016.

At the time of writing, when the value chain analysis was conducted, pigeon pea exporters, traders and farmers have unanimously confirmed that trade is currently very slow and farm gate prices are plummeting to between MWK 100 and MWK 120 per kg (US\$136 to US\$163 per MT) in the country. Exporters interviewed for this study estimate that import prices in India in July 2017 have ranged between US\$350 and US\$450 per MT, depending on quality and origin.

**Figure 4: Average import price to India in US dollars (USD)/kg and Indian rupees (INR)/kg**



Source: Zauba import export data, [www.zauba.com](http://www.zauba.com)

Pigeon pea produced in Malawi directly competes with pigeon pea produced in Myanmar, Tanzania and Kenya. In recent years, Sudan, Uganda and Ethiopia have also managed to secure a market share in imports of pigeon pea to India. The Indian market mostly prefers imports from Myanmar, which has low transaction costs, short delivery times and a high quality that matches demand in India. Malawi has long-term trade relations with India in pigeon pea trade and pigeon peas from Malawi are well known and accepted in the Indian market. Despite this long-term relationship, prices of pigeon pea from Malawi are on the lower end because of the varieties used. In July 2017, none of the exporters had started buying pigeon peas yet and no exporter was ready to announce a buying price for pigeon pea for 2017.

As a result of the current oversupply and low prices of pigeon pea in the international markets, on 05 August 2017 the Indian Government imposed a ban on pigeon pea imports (Notification 19/2015–2020). Only contracts that were signed and at least partly paid before the 01 August 2017 have been allowed to be executed. According to interviews with exporters in Blantyre in September 2017 only very few contracts have been signed and partly paid at this time, and none of the exporters interviewed is currently buying pigeon pea. Also, several of the ACE warehouses are still holding large quantities of pigeon pea from the 2016 harvest: more than 1,000 MT in March 2017

(ACE, 2017). Pigeon pea prices are currently less than MWK 100/KG in the villages visited in July and September 2017 despite the fact that the Government announced that the minimum price for pigeon pea should be at least MWK 320/kg (Government of Malawi, April 2017 – see Annex E). In spot surveys between 6 and 9 September 2017, pigeon pea prices at eight different buying points in Phalombe, Zomba and Mulanje districts still ranged between MWK 70 and 100/KG. All local traders confirmed that in the past 10 days prices have slightly increased by around MWK 20/KG and they expect the price to increase further. A pigeon pea processor in Blantyre stated to buy pigeon pea at MWK 107/KG (Interview, 07 September 2017), but it was also mentioned that only a very limited amount of good quality grain would be purchased. A speech by the President of the Malawi Confederation of Chambers of Commerce and Industry (MCCCI), Karl Chokotho, on 16 August, at the official opening of the 14<sup>th</sup> National Agricultural Fair in Blantyre, adequately summarised the current situation as follows: *'It is sad that having worked so hard, pigeon peas farmers are now faced with the prospect of unprecedentedly low prices because of abrupt import restrictions expected to be imposed by the Government of India, with a view to supporting domestic prices of its own pigeon peas in India'* (MCCCI, 2017).

## 2.2 Stakeholder analysis

During the value chain analysis, a wide range of stakeholders in the pigeon pea value chain were interviewed. The sample included farmers, traders, processors, exporters, operational service providers, agro-input suppliers and support service providers, such as the ADDs, District Agricultural Development Officers (DADOs), cooperatives and associations. An overview of the identified stakeholders is given below.

### 2.2.1 Farmers

Drought resistant crops can reduce the risks that smallholders face as they fulfil food security objectives through local consumption and by generating cash income when monetised (OPM *et al.*, 2017). Farmers interviewed for this study were all intercropping pigeon pea with maize, and in some cases with millet. Among the interviewed farmers, the typical area under cultivation ranged between 0.3 and 0.8 hectares (ha). Interviews with farmers revealed that pigeon pea yields on 0.1 ha of land ranged between 30 kg and 100 kg on intercropped fields and up to 250 kg on pure stand.<sup>4</sup>

While research indicates that pigeon pea in pure stand can produce up to 300 kg on 0.1 ha, none of the farmers interviewed harvested quantities within this range. Farmers are aware of the different varieties and their potential market traits, but none of them has access to quality or certified seeds. The seeds were either not available in their areas or they simply cannot afford to buy them. Only farmers who have participated in various development programmes had access to certified seeds in the past. Many of these farmers stated that certified seeds and improved varieties available are not attractive for them because they are very susceptible to insect pests, resulting in total crop loss for the *Maiwathualimi* variety if no pesticides are used. One of the farmers visited cultivated both white and red pigeon pea varieties. While red pigeon pea showed good yield and healthy pods, insects damaged most pods of the white varieties. The farmer had not used any agrochemicals or other management practices to prevent insect damage. Farmers stated that existing improved varieties are not adding any value to their farming systems.

Farmers are also disappointed with the current market situation and prevailing prices. Their price expectations have been built over trends in the last 20 years, which has seen a constant increase in farm gate prices from US\$350 per kg in 1997 to US\$786 per kg in 2015. While farm gate prices

<sup>4</sup> Maize yield on intercropped land was between 50 and 200 kg per 0.1 ha.



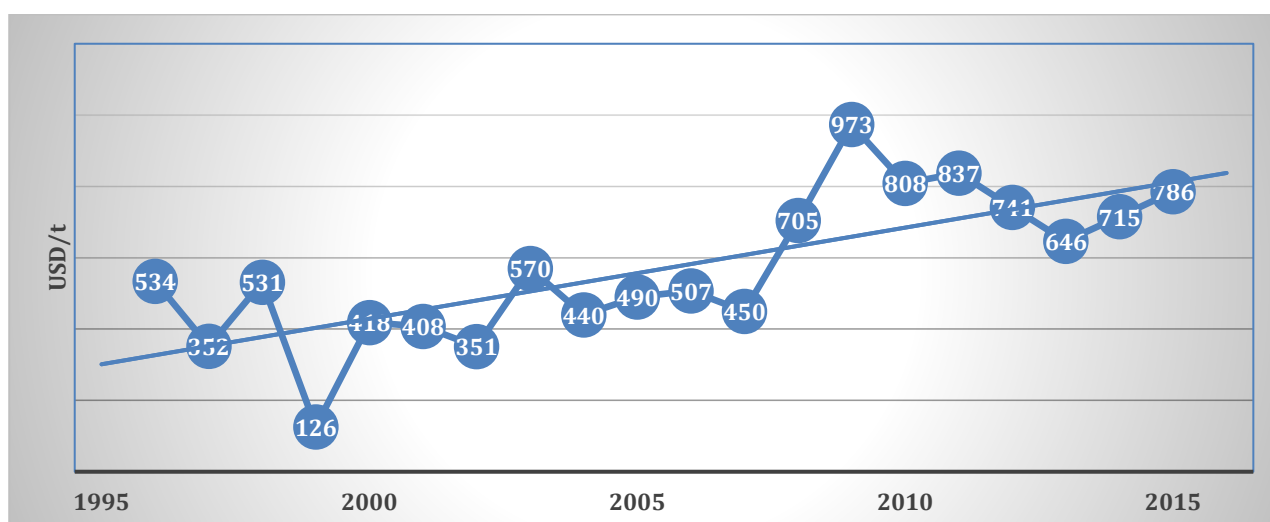
fluctuate by around 20% annually, farm gate prices had been continuously increasing up to 2015. Since 2015 farm gate prices have declined from US\$786/ MT (MWK 500/kg) in 2015 to US\$400/MT (MWK 300/kg) in September 2016, and then further to US\$83/MT (MWK 60/kg) in July 2017. Several farmers stated in July 2017 that they have not even harvested their pigeon pea, although it is ripe, because they do not see where they can sell their product. In September 2017, most farmers had harvested and stored their pigeon pea in their homes, expecting that farm gate prices will increase by early 2018.

According to gross margin calculations based on interviews with farmers, smallholders invest between MWK 10,000 and MWK 20,000 to cultivate 0.1 ha of pigeon pea. More than 50% of the total cost is the cost of labour, which is either paid out as *ganyu*<sup>5</sup> or spent as time spent on work by the household. The rest of the costs include the cost of seeds and other inputs. With yields between 100 kg and 200 kg for 0.1 ha the average production price for 1 kg pigeon pea is around MWK 150 (see Annex D for detailed calculations).

### Box 1: Gross margin calculations of producing pigeon pea in Malawi

During the value chain study, gross margin calculations were collected from the DADO in Mulanje and in Phalombe (see Annex D). Additionally, based on FGDs and interviews with selected farmers, sample gross margin calculations were carried out. The total variable cost, including all inputs and work invested, ranges between MWK 140,000 and MWK 281,000 per ha for farm production in 2016/17. At the same time, the yields reported range from 800 kg to 2,000 kg. The Phalombe example showed the break-even price to be MWK 150/kg for pure stand pigeon pea production and a yield of 1000 kg/ha. The farmers interviewed were intercropping pigeon pea with maize and millet and the break-even price was MWK 120/kg while harvesting 200 kg from a 0.25 ha intercropped area. The Mulanje gross margin calculation shows a break-even point of MWK 160/kg pigeon pea, harvesting 1,750 kg/ha. Assuming a sales price of MWK 200/kg later this year the smallholder farmer interviewed would have a gross margin for 1 ha of MWK 66,000, compared to an investment of MWK 94,000. The Mulanje example shows a gross margin of MWK 68,400, with an investment of MWK 281,600, and in Phalombe the gross margin is MWK 51,350, with an investment of MWK 148,650.

Figure 5: Producer price for pigeon pea



Source: OPM *et al.*, 2017.

The cost of producing pigeon pea is dominated by the time needed to prepare the land and do the weeding (*ganyu*). Based on individual farmer interviews and FGDs, land preparation needs three man days for each 0.1 ha. Land preparation is done by the farmer on smaller plots, or with the help of day workers on bigger plots. Farmers also work in groups to prepare their land. Land

<sup>5</sup> *Ganyu* is short term rural labour such as piecework weeding or ridging on the field of other smallholders.

preparation is typically a men's task, but on several of the smaller farms visited and interviewed land preparation is carried out by a couple.

Weeding of the field is done at least twice during the growing season. 0.1 ha weeding of intercropped maize/pigeon pea requires four man days for each weeding. Harvesting requires one man-day for each 0.1 ha. None of the farmers interviewed had used any other inputs in pigeon pea farming.

## 2.2.2 Farmers' organisations

A number of farmers' organisations were visited by the research team between July and September 2017. The organisations visited ranged from informal farmers' groups to organised cooperatives and associations – for each of them pigeon pea was considered their main crop.

One of the biggest farmers' associations in Malawi is **NASFAM**, which currently has more than 164,000 members. NASFAM discontinued trading in pigeon pea in 2010, after a marketing study found that pigeon pea trade was unprofitable (Simtowe *et al.*, 2011). Nevertheless, NASFAM, in collaboration with ACE and development partners, has been encouraging farmers to utilise the warehouse receipt system for pigeon pea. A NASFAM warehouse managed by ACE was visited and the warehouse manager was interviewed.<sup>6</sup>

Based on the stakeholder interviews, the research team found that most farmers' organisations in Malawi were not founded with the objective of providing business-related services to their members. Although farmers can use their organisations to market their products, few farmer groups really do this for their members and very few groups or cooperatives become a trading entity that buys agricultural produce from their members. Even if a group manages to build a storage facility, in most cases there is a lack of a clear business plan which would allow the cooperative to take advantage of the facility. Most of the producer groups visited that were either in the process of building a warehouse or had already built a processing facility had no idea about how to utilise the facility or how to cover the costs related to the operations of the facility. This has been identified as a significant gap that the replicable business model will aim to fill and investigate through the SRMS project.

## 2.2.3 Exporters

In Malawi, more than 10 companies can be identified as the main buyers, processors and exporters of pigeon pea. In addition, a few other companies operate in Malawi during the main buying season but do not maintain their presence throughout the year (OPM *et al.*, 2017). Export to India is mainly comprised of whole dried pigeon pea. Normally, about 60% of the marketed pigeon pea in Malawi is exported as whole dried pigeon pea and 40% is processed into dhal. The reason why India only imports whole dried pigeon pea from Malawi is that India has a much more advanced processing industry than Malawi (according to interviews with different exporters and processors). This makes dhal processed in Malawi uncompetitive as against dhal processed in India.

Export to India profits from the timing of the harvest in Malawi, which happens six months before the harvest in India starts. This enables pigeon pea from Malawi to arrive in India at the time of peak price in November and December (Simtowe *et al.*, 2011).

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<sup>6</sup> Farmers and farmers' organisations pay a monthly storage fee of MWK 3 per 50 kg bag. Additionally, farmers pay a fee of MWK 100 per 50 kg bag for fumigation, handling, off-loading and loading. Farmers are given a receipt on deposit of their product. The receipt states the quantity, unit price and total value on the day of deposit and the owner of the receipt can receive credit from a participating bank of up to 70% of the value of the receipt.

**Table 2: Value of pigeon pea trade, selected countries**

Exporter	2014 (\$m's)	2015 (\$m's)	2016 (\$m's)	2015 - 2016 Change (\$m's)	Change (%)	Share in India's imports 2015	Share in India's imports 2016
<b>World</b>	<b>380</b>	<b>520</b>	<b>616</b>	<b>97</b>	<b>19%</b>	<b>0</b>	<b>0</b>
Myanmar	203	225	253	28	13%	43%	41%
Tanzania	83	112	115	2	2%	22%	19%
Mozambique	50	93	97	4	5%	18%	16%
Sudan (North & South)	11	16	64	48	305%	3%	10%
<b>Malawi</b>	<b>28</b>	<b>63</b>	<b>39</b>	<b>-22</b>	<b>-36%</b>	<b>12%</b>	<b>6%</b>
Kenya	3	10	21	10	100%	2%	3%
Uganda	1	1	19	17	1434%	0%	3%

Source: UN Comtrade Statistics

Malawi is the lead pigeon pea producer in Africa and the third biggest producer worldwide, but while Malawi exports about 35% of the total production, this rate is much higher in Tanzania. Tanzania exports higher quantities of pigeon pea than Malawi: the export value of pigeon pea from Tanzania in 2015 was close to double the export value for Malawi. In 2016, Malawi lost half of the share of India imports because, due to the lower prices, pigeon pea from Malawi was not competitive in the market. With even lower world market prices in 2017 Malawi will have a hard time exporting substantial volumes to India.

**Table 3: Annual production of pigeon pea for selected countries in MT**

Country/year	2011	2012	2013	2014	2015*
India	2.860.000	2.650.000	3.022.700	3.290.000	3.628.000
Malawi	220.017	237.210	287.983	335.165	373.470
Tanzania	272.608	206.057	247.387	248.000	
Uganda	93.645	13.300	13.380	13.400	
Kenya	84.313	167.623	165.636	274.523	

Source: FAO Stat, \*IndexBox for 2015 production volume

All exporters interviewed confirmed that white flat pigeon pea varieties are preferred in the market. They are easier to process, have a better processing ratio and the taste is preferred to red and mixed varieties. While the white varieties attract a price premium of US\$30–50 in the export market, for the time being no premium is offered for the purchase of this type of pigeon pea in Malawi.

## 2.2.4 Processors

Pigeon pea processing in Malawi is concentrated in Blantyre and Limbe, close to the main production areas. A number of companies are engaged in processing pigeon pea into *dhal*. Except for RAB Industries and Atlas Industries, all other processing is done for the overseas export market and none of the companies interviewed targets the African market (for example the South African Development Community – SADC). All companies process and export dhal throughout the year. They also buy pigeon pea all year round but take advantage of the low price after harvest to fill up their storage capacity. All processors prefer white flat varieties because they are easier to process and have a higher yield in processing but no premium price is paid for white varieties.

## 2.2.5 ACE

Direct volumes of pigeon pea traded through ACE have shown a slightly downward trend between 2014 and 2016. They represented 693 mt, 627 mt and 445 mt of trade in 2014, 2015 and 2016, respectively. Volumes utilising the warehouse receipt system were very limited in 2014 and 2015, with 45 mt and 28 mt, respectively. In 2016, deposits increased to 2,290 mt. As at July 2017 close to half of these deposits were still in the warehouses (ACE Pigeon Pea Market Analysis, March 2017). All processors and exporters interviewed stated that they could not process or export pigeon pea from the previous season as soon as the new crop is available.

### Box 2: Case study of warehouse receipt system for pigeon pea

In July 2016, a great number of deposits entered the ACE warehouse receipt system. At that time, the price per kg of pigeon pea was MWK 500 and farmers and cooperatives were awaiting higher prices later in the season, as in previous years. On deposit, a receipt is issued, with the total volume, the unit price and the total value.

In this case study, we look at a farmer group that collected 1,000 kg of pigeon peas from its members and deposited it in the ACE warehouse at the end of July 2016. The table below shows the value and the costs for the deposited pigeon peas.

	01.08.2016	16.11.2016	25.02.2017	15.07.2017
Volume of pigeon peas	1,000 kg	1,000 kg	1,000 kg	1,000 kg
Market price MWK/kg	MWK 500	MWK 300	MWK 200	MWK 100
Total value of pigeon pea	MWK 500,000	MWK 300,000	MWK 200,000	MWK 100,000
Handling fee MWK 120 /bag	MWK 2,400	MWK 2,400	MWK 2,400	MWK 2,400
Storage fee MWK 3 /bag/day	MWK 0	MWK 6,000	MWK 12,000	MWK 20,400
Value of pigeon pea after cost	MWK 497,600	MWK 291,600	MWK 185,600	MWK 77,200

The table shows the development of the value of pigeon pea. Most farmers and their organisations also took a loan of 70% of the value of the pigeon pea. In this case study, the group took a loan in August 2016 of MWK 300,000 to buy seeds for the new planting season. The pigeon peas in the warehouse became the collateral. The farmers' group agreed to repay the loan after five months or earlier, depending on when they sell the pigeon pea. The interest rate was 24% per annum or 2% per month. At the time of writing, in September 2017 the group still has to repay the loan and together with the interest the total debt reached more than MWK 360,000 in July 2017, while the value of the pigeon pea has reached MWK 77,200 after deduction of applicable warehouse fees. This represents a loss of MWK 282,800 for the group.

The warehouse receipt system for pigeon pea over the last year has failed to positively impact the market. The decision to utilise the warehouse receipt system for a product which is characterised by volatile market prices, a very short main trading period and limited market opportunities, was a very risky decision and has indebted many farmers, farmers' organisations and traders. The SRMS Inception Report also noted that 'While this [the warehouse receipt system] is profitable for maize, however, where the price rises continuously after harvest, it may not be profitable for pigeon pea, where the price usually falls continuously after harvest' (OPM *et al.*, 2017). The owners of the more than 1,000 mt of pigeon peas still in stock at the warehouses will find it very difficult to sell their pigeon peas from last year's harvest, but they will still need to repay the cost of credit.

## 2.2.6 Input supply

Most farmers do not use external inputs to produce pigeon pea, which is one of the reasons for the low productivity of this crop. Farmers in Southern Malawi have multiplied pigeon pea land races for generations. The improved varieties released in the last 15 years have failed to convince farmers and extension staff of their advantages. Most released varieties are prone to insect damage and

are heavily dependent on external inputs. As white varieties do not attract a price premium in Malawi, farmers have very few reasons to change from the traditionally cultivated red varieties (Nthawajuni). Input supply in rural Malawi is limited to the bigger trading centres and to the district capitals. At the same time, input supply is mainly for high value and cash crops, like vegetables, maize and tobacco. While certified pigeon pea seeds are available, they are mostly distributed through NGOs and their programmes, rather than being readily available in shops.

Land races of pigeon pea do not need any crop protection and farmers also do not use any fertilisers. The demand for external inputs for pigeon pea farming is therefore very limited.

### 3 Case study of Sukamphete Pigeon Pea Farmers' Cooperative

The SRMS Scoping Study selected Blantyre ADD in the Southern Region of Malawi for the SRMS research project (OPM *et al.*, 2017). This selection was justified by a number of criteria, including the significance of pigeon pea production and consumption in this part of the country, as well as the importance of the pigeon pea value chain in the Southern Region – in particular the concentration of business actors, traders and producers in Blantyre. While the Southern Region was selected, the SRMS Scoping Study left it open for the value chain study to select the specific area (and farmers' group) with whom the research project will work in the future. As discussed in Chapter 2, the research team conducted a thorough investigation and visited a number of potential project sites to select the farmers' cooperative with whom a business model will be developed (see Map 1 for the areas visited by the research team).

Selecting the right area and narrowing down the geographical focus of the research took a significant amount of time and involvement by the researchers. The selection of the geographical area in which to implement the replicable business model was made based on triangulation of a broad range of information, including local key experts' views. In addition, the research team spent several days in the field interviewing farmers, measuring their expected yield and estimating gross margin calculations for producing pigeon pea (Box 1).

Based on the interviews and field visits the following criteria were identified that the appropriate research site should fulfil:

1. **Existence of a local farmers' cooperative / marketing structure for pigeon pea.** During the meetings, it was confirmed by all stakeholders that in order to design and successfully implement a business model in the rural areas, a local marketing structure must exist with which the project can engage. It would not be possible to work with individual farmers directly as the business model would need to utilise 'economies of scale' at the cooperative level. From the project's perspective, it is also important to deal with a legal entity when it comes to implementing the project in the rural areas.
2. Given the current situation in the pigeon pea market, which is characterised by extremely low pigeon pea prices, it was agreed that the business model should test **opportunities to add value to the product at the local level**. A cooperative whose only opportunity is to trade in raw pigeon pea will have a limited chance to receive a higher producer price for their produce. While value addition to pigeon pea is not common at the village / cooperative level in Malawi, selecting a group with processing equipment (which provides the *option* for the cooperative to add value at the local level) will enable the research team to test a business model that transfers part of the value chain to the rural areas, which could potentially result in higher profits in the hands of smallholders.
3. Previous experience with **receiving seeds** by farmers through different schemes, for example the Community Service Enterprise Project (see later). This would enable the research team to build on existing capacity and experience in the community.
4. It was unequivocally agreed by the interviewed stakeholders that the research area must have existing good **connections to the main markets** – including traders in Blantyre, as well as access to agricultural extension services.

Based on the above criteria and required characteristics the research team selected a farmers' cooperative in Phalombe District. The selection was made in close collaboration with the

interviewed stakeholders, including the Manager of Blantyre ADD and the DADO of Phalombe District. The area and the cooperative selected fulfil and 'tick' all the requirements which were identified during the stakeholder interviews, including having a huge potential to test value addition at the local level.

**Sukamphete Pigeon Pea Farmers' Cooperative** is based in **Bona Village Group** in Phalombe District, within Tamani Environmental Planning Area, Jenala Traditional Authority and Blantyre ADD. Bona Village Group is comprised of 13 villages, including Chitekesa, Bona, Bona 2, Mulima, Dzuwa, Chikopa, Ligola, Ligomeka, Chitungo, Ntikwa, Chilombo, Nayuma and Nankhonya. In the year 2004, 50 pigeon pea farmers from Bona Village Group formed the Sukamphete Pigeon Pea Farmers' Cooperative, which is located within Chitekesa village. At the time of writing, the Cooperative has 72 farmers, who are all based in the villages of Bona Group Village. The village group has a total population of 6,291 people living in 3,587 households.<sup>7</sup>

**Table 4: Population of Bona Village Group**

Village name	Number of households	Population
Chitekesa	500	760
Bona	360	560
Bona 2 (M'Bona)	175	300
Mulima	250	460
Dzuwa	195	267
Ligola	170	250
Ligomeka	390	678
Chikopa	201	402
Chitungu	354	780
Ntikwa	200	367
Chilombo	350	670
Nayuma	186	297
Nankhonya	256	500
<b>TOTAL</b>	<b>3,587</b>	<b>6,291</b>

Source: Bona Village Group, FGD and interview with DADO, 8 September 2017, Chitekesa village.

In 2012 the Local Development Fund (LDF), funded by the African Development Bank and managed and implemented by the Government of Malawi, built a pigeon pea processing factory in Chitekesa village. The factory was not functional and remained idle for four years, until March 2017, when it was finally electrified. The facility therefore started to function in March 2017, however due to lack of funds only a few bags of pigeon pea have been milled so far by the Cooperative. Sukamphete Cooperative, and the pigeon pea factory, do not have a business model or any plans to guide their operations as no market outlets had been identified by either the LDF or the members of the Cooperative.

Sukamphete Cooperative has been targeted by development interventions before. In 2015, incentivised by high pigeon pea prices, the LDF encouraged farmers to grow pigeon pea and distributed improved seeds (*Maiwathualimi*) among the farmers. Every member received 2 kg of seeds and were asked to return 4 kg of crop after the harvest. While the Cooperative members

<sup>7</sup> The average household size in this village is 1.75 people per household, which is much lower than the average household size of 4.4 people per household in the Southern Region, as reported in the Population and Housing Census (2008: page 17). The reason for this anomaly could not be verified during the fieldwork, but the subsequent surveys will collect information on demography in the interviewed households.

confirmed during the value chain workshop that 'all' farmers returned the agreed quantities at the end of the production season, the harvest was transported out from the area and not left with the Cooperative to manage (i.e. sell) the produce to generate income and make the model replicable. In 2016 there were no more seed distributions in Bona Village Group, although the Cooperative purchased pigeon pea seeds from the Community Service Enterprise Project (36 kg worth of MWK 49,000).

### 3.1 Risks faced by smallholders in Bona Village Group

Farmers based in Bona Village Group face all types of systemic risk identified in Section 1.1: natural shocks, price risks, economic coordination risks, and risk of opportunism. These risks are discussed in detail below.

#### 3.1.1 Natural shocks

In the study area natural shocks represent a major source of risk for smallholders. **Drought and erratic rainfall** are among the most significant natural hazards and cause risks for pigeon pea growers in Phalombe district. The rainy (main growing) season normally lasts from November to April, but rainfall patterns have been very erratic in recent years. For example, during the month of January rainfall ranged between 200 and 600 mm (2012) and 600 mm (2011) and rains have often stopped as early as March. In addition, the traditional *chiperoni* rains (rains following the main rainy season between June and July) in the area also seem to have failed in recent years.

In addition to unpredictable rainfall patterns, pigeon pea growers have experienced yield losses caused by **pests and diseases** in the study area. The major pests of pigeon pea are podborers (*Helicoverpa armigera*) and pod sucking bugs (*Nizara viradula*) and the two major diseases of pigeon pea which are prevalent in the area are Fusarium wilt and Cercospora leaf spot (Kamanga *et al.*, 2014; ICRISAT 1998). Long-duration pigeon pea varieties are particularly susceptible to Fusarium wilt disease and yield losses can be as high as 85% in a bad year (*ibid*).

Pigeon pea can be **damaged by livestock** if they are allowed to graze freely after the harvest of maize (Bezner-Kerr *et al.*, 2007). While in the study area local bye-laws aim to control free grazing after the maize harvest, smallholders explicitly prefer short-duration varieties as long-duration pigeon pea can still be damaged by livestock despite the existence of local laws (Kamanga *et al.*, 2014).

Traditional long-duration pigeon pea varieties have a longer cooking time than white varieties due to their hardy shell. This leads to high use of firewood for cooking, which increases environmental pressure and leads to deforestation.

#### 3.1.2 Price risks

As discussed in Chapter 2, the prices of pigeon pea are heavily influenced – indeed, they are determined – by external factors, mainly by demand in India. Pigeon pea producers in Malawi are price *takers* and are exposed to fluctuations in producer prices. The bulk of the pigeon pea harvest in the area is purchased by local traders (vendors) at harvest time and sometimes directly by companies based in Blantyre, which send trucks to the area at harvest time. Due to lack of collective marketing arrangements by smallholders, the bargaining power of individual farmers selling small quantities is weak; this results in even lower prices offered at harvest time. Farmers are forced to accept the prices offered by traders as they have immediate cash needs during harvest time.



### **3.1.3 Economic coordination risks**

Farmers in Bona Village Group have very limited access to agricultural inputs, including high-quality seeds, fertiliser or agrochemicals. The nearest commercial outlets where these products are available for sale are in Phalombe Boma, which is approximately 40 km from the village group. A single farmer can rarely afford to travel to Phalombe Boma to buy the necessary inputs for their farm.

Distance from the main trading areas and lack of coordination and collective action by farmers causes further inefficiencies and loss of income as harvests are not marketed collectively by farmers.

### **3.1.4 Risk of opportunism**

There are significant risks of opportunism in the study area. The high volatility of pigeon pea prices in Malawi has created opportunities for traders to purchase pigeon pea from farmers at the lowest possible prices right after harvest. In the past three years prices have fluctuated between MWK 100 and MWK 900 per kg. Cash-constrained farmers are forced to sell their produce early for whatever price they are offered on the market. Storage for pigeon pea is not relevant as the market closes in early December and after that prices are likely to fall.

## 4 Design of a replicable business model

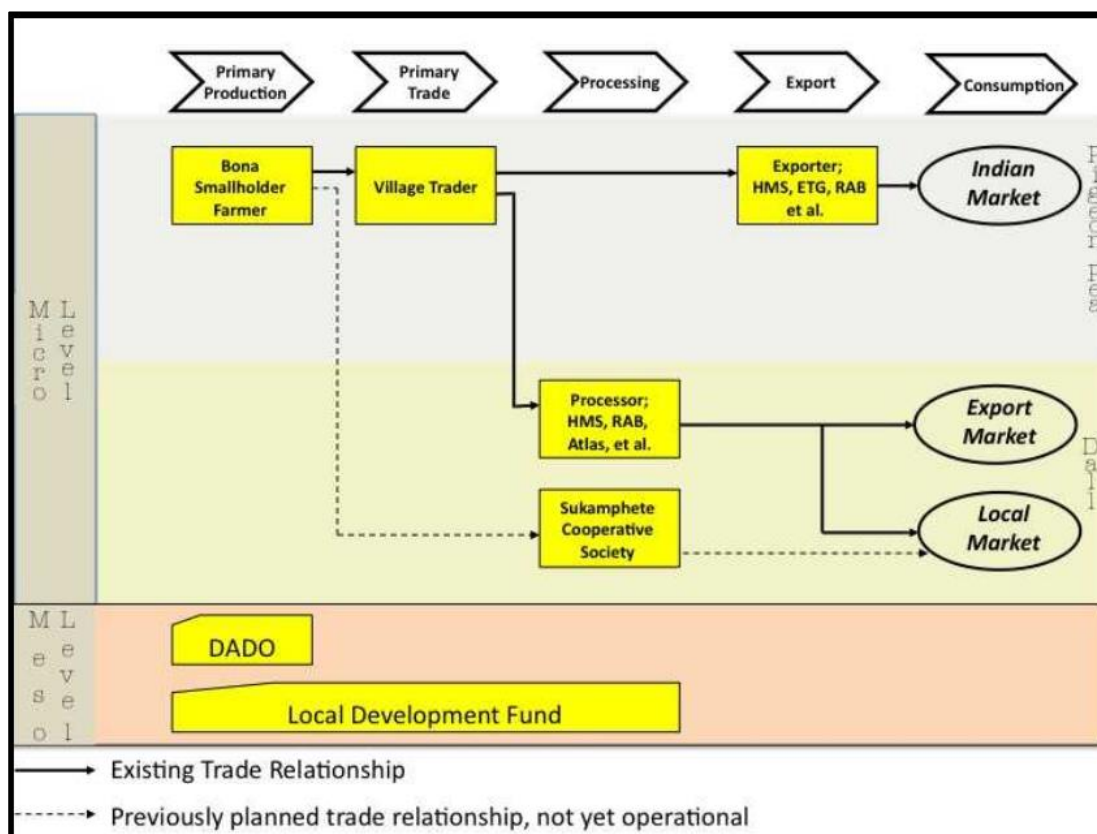
The replicable business model for Sukamphete Cooperative was developed during the value chain stakeholder workshop (08 September 2017) by the participants themselves, facilitated by the research team. The development of the model involved three steps: (1) to understand the characteristics of the pigeon pea value chain in Bona Group Village; (2) to identify where the performance of the value chain could be improved; and (3) to design a replicable business model which would address these challenges. These three steps are described in detail below.

### 4.1 Description of the value chain in Bona Group Village

The participants identified five value chain functions: primary production, primary trade, processing, export and consumption. The starting point was the Bona smallholder farmer, who is the primary producer of pigeon pea (and whose risk the SRMS project aims to reduce). Farmers sell to local traders, either at the farm gate or at the local markets and seasonal buying points in the area. Even though Sukamphete Cooperative could in principle become a primary trade entity directly linking farmers to exporters and processors, this has not happened so far due to lack of funds and entrepreneurial skills. For the same reasons and due to the lack of electricity connection until March 2017, the dhal processing equipment installed at the Cooperative has not been utilised.

The next step in the value chain identified by the workshop participants was the exporting of raw pigeon pea to India, as the main market for pigeon pea produced in Malawi. They also identified that the same companies that export raw pigeon pea to India also process dhal for other export markets (Malaysia, UK, USA, Dubai, etc.), and for the local market. Figure 6 below shows the value chain map.

**Figure 6: Value chain map developed during the value chain workshop**



## 4.2 Challenges in the value chain

The first challenge identified by the workshop participants was at the primary production level, as **certified seeds** and other inputs are not available in the Bona area. (During the value chain analysis, the research team visited Jali market (approximately 20 km from Bona village) and other local markets in Phalombe District. During these visits, it was confirmed that no pigeon pea seeds were available at the markets close to the planting season). The participants explained that although Sukamphete Cooperative was in the past able to source certified seeds through the LDF and the Community Service Enterprise Project, these institutions have not provided support to their members this year.

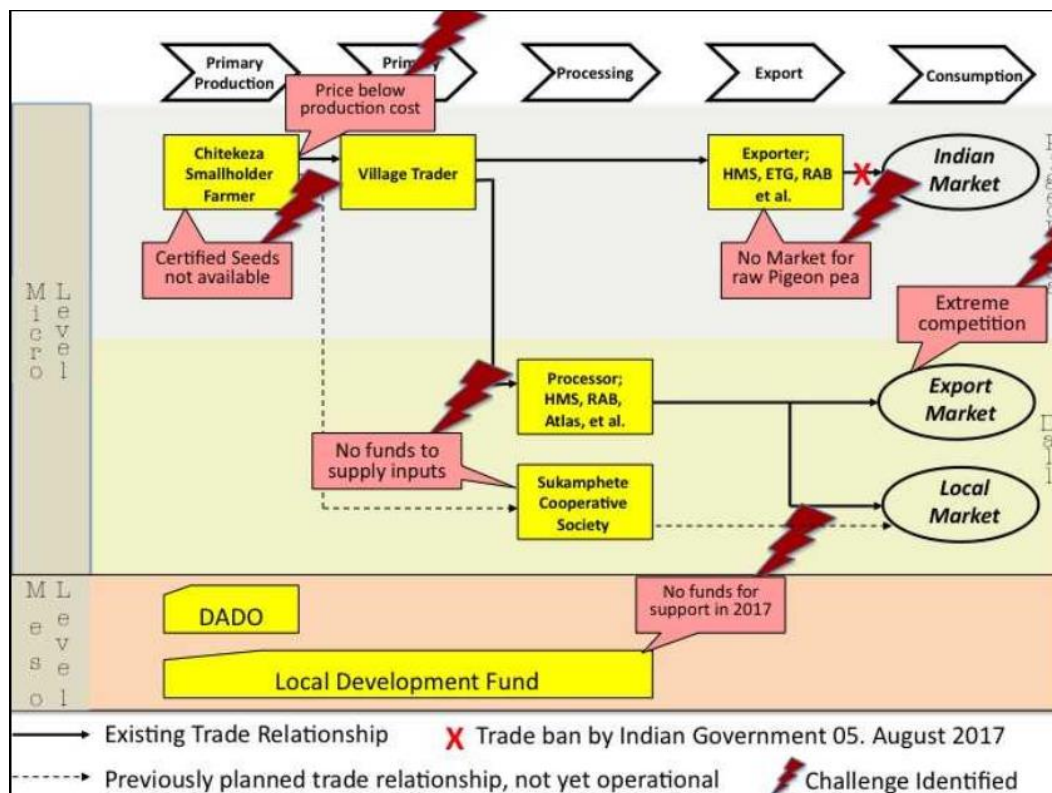
The second challenge identified is related to the prices of pigeon pea. As described in detail in Chapter 2, at the time of writing (September 2017) pigeon pea **prices** are at a historically low level. Prices have dropped to MWK 70–100, which is significantly lower than the prices at the same time the year before (MWK 500) and the prices at the same time two years ago (MWK 900). The workshop participants confirmed that these prices are below the cost of production, which also triangulates with gross margin calculations by the District Agricultural Development Authorities of Phalombe and Mulanje districts, as well as with the calculations done by the research team on two selected pigeon pea farmers in Ndanga Village (Mulanje District) (see Annex D). The table below shows pigeon pea farm gate prices at harvest time (June / July) in Bona Village Group.

**Table 5: Producer price of pigeon pea at harvest time in Bona Village Group**

Year	Price (MWK / kg)
2013	150
2014	250
2015	700
2016	360
2017	100

Source: Value chain workshop (08 September 2017) and FGDs in Bona Village Group.

The workshop participants also mentioned that on 05 August 2017 the Indian Government introduced a restriction on pigeon pea **imports to India**, which is one of the reasons for the low prices in Malawi (and in the world). Additionally, this situation has led to extreme competition in the various export markets for dhal.

**Figure 7: Challenges identified during the value chain stakeholder workshop**

### 4.3 Business model to address challenges

Despite the above described difficulties and the heavy fluctuations in pigeon pea prices, participants at the value chain workshop confirmed that farmers in Bona Group Village remain committed to planting and growing pigeon pea during the next (2017/18) agricultural season. Due to the prevalent low prices, most farmers have not yet sold their recent harvest and are still expecting farm gate prices to increase to MWK 300 by April 2018. As they are still currently storing (in their own houses) most of their pigeon pea harvest from this year in expectation of price increases in the coming months, they remain cash constrained until the prices start to rise and they decide to sell their harvest. Consequently, as pigeon pea is the main source of income for most farmers, during the current agricultural year farmers have much fewer financial resources to invest in next year's production, including buying improved seeds to plant in November / December 2017.

The business model will aim to bridge this financing gap by enabling farmers to buy good quality improved seeds of pigeon pea varieties. Under the characteristics of the current market this is the **only** entry point for a business model which aims to be replicable in subsequent years, as the market conditions (including the prices) are exogenous for the farmers and cannot be influenced by the research project. The business model therefore aims to enable Sukamphete Pigeon Pea Farmers' Cooperative to become a reliable seed supplier for its members, as well as for other farmers in Bona Group Village.

The important characteristics of previous interventions in Bona Group Village were that: (1) they entirely depended on continued donor / project input; (2) they were 'one-off' interventions lacking a long-term vision and set of objectives to strengthen and develop the cooperative's capacity; and (3) none of these interventions provided continued access to improved seeds for the members of the Cooperative. Besides, in most cases the seeds were delivered too late and the quality of seeds was also low. These intervention models for seed distribution clearly do not build resilience or offer

any solution to the complex problems faced by the farmers. It was confirmed during the value chain workshop that this year (in 2017) the Cooperative has not been targeted for distribution of improved seeds. This has provided an entry point for the SRMS project business model which will aim to address the negative characteristics of previous interventions.

### 4.3.1 Seed revolving fund

During the stakeholder workshop, the participants, with the facilitator's assistance, designed a viable business model for the Cooperative. The underlying objective of the replicable business model is to provide *continued* access to high quality seeds to members and other farmers in the area by establishing a *seed revolving fund*. The initial seed purchase for 2017 planting will be financed by the SRMS project, but all other costs and seed purchases in subsequent years will be financed out of the proceeds of the seed business run by Sukamphete Cooperative. At the same time, the SRMS project will aspire to strengthen the marketing capacities of Sukamphete Cooperative by brokering contacts with the World Food Programme (as a potential buyer, through the Purchase for Progress (P4P) initiative) and by registering the Cooperative with the ACE. During the second fieldwork practicum, the research team registered Sukamphete Cooperative with ACE and connected the Cooperative to the World Food Programme P4P officer.

#### First season of the seed revolving fund (2017/18)

For the growing season 2017/2018 the stakeholder workshop decided that the project should target 200 farmers, of whom 72 will be members of Sukamphete Cooperative (i.e. all members are targeted), with 128 additional farmers from the area. Each farmer will prepare 0.2 ha of land to produce pigeon pea and thus receive 2 kg of treated certified seeds, of which 1 kg will be Maiwaturalimi and 1 kg will be Chitedze 1 variety. This allocation assumes a seed rate of 10 kg/ha, which is based on recommendation by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) of 8–10 kg / Ha for medium duration varieties (Kananji *et al.* 2015) and which was also confirmed by the DADO and by farmers in the area. The value of the 2 kg seed package provided to the farmers will be MWK 3,600 (MWK 1,800/kg for each variety). Each farmer will plant and manage the pigeon peas as part of their routine farming activities. The agricultural extension staff based in the area will provide support as and when needed. Farmers are being advised to harvest each variety separately to ensure that high quality C1 seeds can be selected. They are also being advised not to mix any other varieties grown on the farm with the provided seeds. Based on the information provided by members of Sukamphete Cooperative during the stakeholder workshop the yield of certified seeds planted on 0.1 ha is between 180 kg and 250 kg. Out of this harvest each farmer is expected to deliver 4 kg of pigeon pea back to Sukamphete Cooperative Society for each kg of certified seed received – thus a total of 8 kg of pigeon peas. The value of 8 kg pigeon pea returned to the Cooperative Society is expected to be MWK 1,600, assuming a price of MWK 200/kg in August 2018, which is less than half of the value of the seeds distributed. Following this model, Sukamphete Cooperative Society will not recover the cost of investment; therefore, they will have to select at least 400 kg of pure C1 seed from the returned pigeon pea, which will subsequently be included in the seed revolving fund. The rest of the returned pigeon pea can be sold at market prices as food. It is expected that the price of pigeon pea in August 2018 will be around MWK 200, so the sale of 1,200 kg of pigeon pea is expected to result in an income of MWK 240,000 for the Cooperative. From this income, the Cooperative Society will purchase 100 kg of treated certified pigeon pea seeds from seed traders. The cost for the seed is expected to be around MWK 180,000 in 2018, assuming a price of MWK 1,800/kg in September 2018. These 100 kg of treated certified pigeon pea seeds will be distributed to the members for planting in 2018 using the model of the seed revolving fund. Additionally, the Cooperative will distribute 400 kg of selected C1 seed to 200 farmers in the area on the condition that they return 4 kg for each kg seed received. Any farmer who has not returned the required

amount for the seeds received in 2017 will **not** be eligible for renewed seed distribution, unless the Cooperative management explicitly recommends renewed participation because of exceptional circumstances. The replicable business model for the first year is summarised in the table below.

**Table 6: 2017/18 growing season – 200 participating farmers**

Certified seed input 2017	No. of farmers participating in 2017	Area planted with improved seed	Pigeon pea returned in 2018	Pigeon pea sold in 2018 to buy certified seed	Pigeon pea C1 seed retained to distribute	Certified seed input 2018 bought by Sukamphete
400 kg	200	40 ha	1,600 kg	1,200 kg	400 kg	100 kg

The model above is based on the following assumptions:

- Sukamphete Cooperative Society will be able to mobilise all 72 members to participate in the model and 128 additional farmers in the 13 villages of Bona Village Group.
- The participating 200 farmers, after the harvest of 2018, will return 4 kg of pigeon pea for each kg of certified seed received in 2017.
- Out of the 1,600 kg pigeon pea returned, 400 kg can be selected by Sukamphete Cooperative Society as C1 seed for the 2018 planting season.
- 1,200 kg of pigeon pea returned can be sold at a price that is high enough to generate sufficient funds to buy 100 kg certified pigeon pea seed from seed traders. Based on the price of certified seeds (MWK 1,800/kg in 2017) the lowest price for which Sukamphete Cooperative has to sell to achieve this will be MWK 150/kg.

### Second and subsequent seasons of the seed revolving fund (starting in 2018/19)

For the growing season 2018/19, a total of 272 farmers will participate. In 2019, it is expected that the 200 farmers who received C1 seed will return 1,600 kg of pigeon pea to the Cooperative. All of this will be sold by the Cooperative to generate funds to purchase at least 100 kg treated certified seeds from seed traders. The members of the Cooperative who received a total of 100 kg treated certified seeds are expected to return 400 kg of C1 seed, which will be distributed in the next season under the same arrangement.

**Table 7: 2018/19 growing season – 272 participating farmers**

C1 seed input 2018	No. of farmers participating in 2018	Area planted with improved seed	Pigeon pea returned in 2019	Pigeon pea sold in 2019 to buy certified seed	Pigeon pea C2 seed retained to distribute	Certified seed input 2019 bought by Sukamphete
400 kg	200	40 ha	1,600 kg	1,600 kg	0 kg	100 kg

Certified seed input 2018	No. of farmers participating in 2018	Area planted with certified seed	Pigeon pea returned in 2019	Pigeon pea sold in 2019 to buy certified seed	Pigeon pea C1 seed retained to distribute	Certified seed input 2019 bought by Sukamphete
100 kg	72	10 ha	400 kg	0 kg	400 kg	0 kg

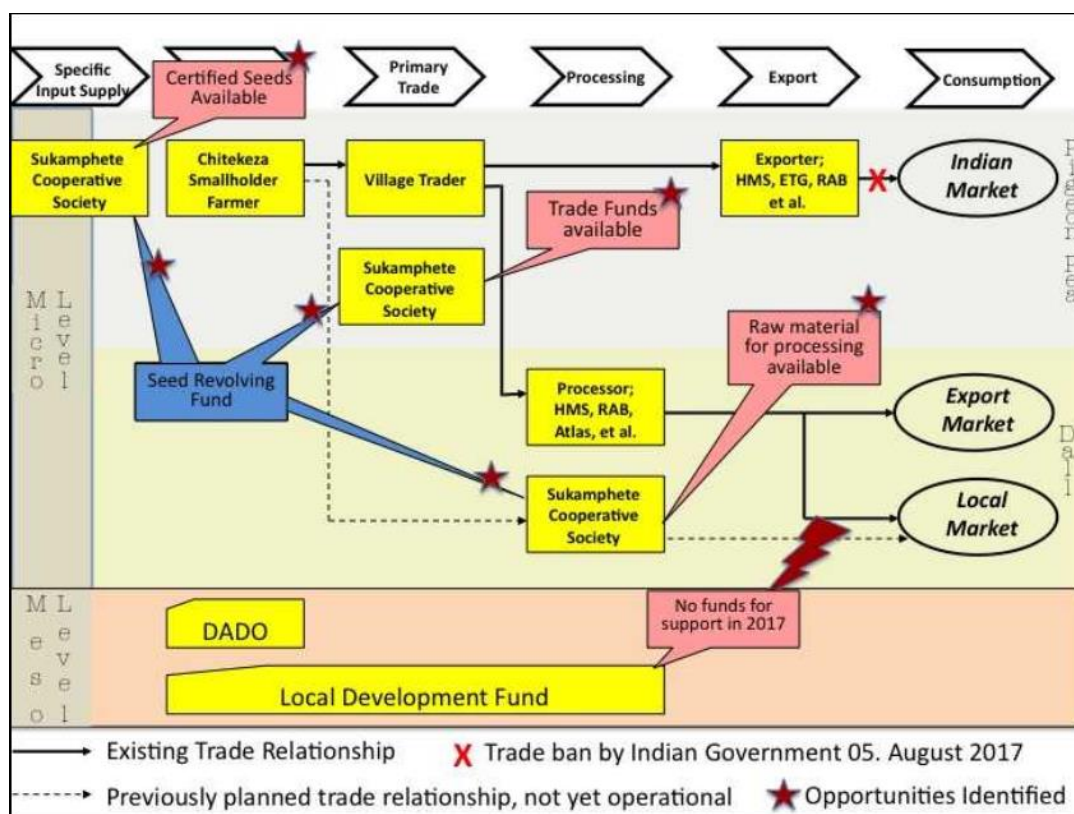
The above model can also continue in subsequent years.

The model makes the following assumptions:

- Sukamphete Cooperative Society can mobilise all 72 members to participate in the model, as well as 200 additional farmers in 13 villages of Bona Village Group.
- These 272 farmers, after the harvest 2019, will return 4 kg of pigeon pea for each kg of certified seed received in 2018.
- 1,600 kg of returned pigeon pea will be sold at a price that is high enough to generate sufficient funds to buy 100 kg certified pigeon pea seed from seed traders.

Based on the historically volatile behaviour of the pigeon pea market, a reliable prediction of the conditions in 2018 and 2019 is **not** possible at the time of writing in September 2017. It is therefore recommended that Sukamphete Cooperative be supported in 2018 to refine and adjust the business model based on existing market conditions in August 2018. If the pigeon pea price is above MWK 200/kg in August 2018, Sukamphete Cooperative would be able to generate surplus income from the sale of pigeon pea that could be used to provide additional services to the surrounding farmers. Possible business models to utilise these funds in a replicable way should be designed by Sukamphete Cooperative, with support from the research team. The additional services that could be provided are shown in the figure below.

**Figure 8: Business model development opportunities for Sukamphete Cooperative**



To strengthen the processing capacity of Sukamphete Cooperative Society the research team will aim to connect the Cooperative Society to experienced dhal processors, upon request by the Cooperative.

## 4.4 How does the business model address smallholder risks?

The risks faced by pigeon pea producers in the study area have been discussed in detail in Chapter 3.2. The replicable business model, which is based on a seed revolving fund, aims to provide farmers with opportunities to reduce risks in various ways.

### 4.4.1 Managing risks caused by natural shocks

As was discussed in Chapter 3.2, the natural shocks that cause major risks for smallholders in the study area include drought and erratic rainfall, pests and damage to the crops caused by livestock. The replicable business model developed in this study aims to reduce each of these risks, at least indirectly. The pigeon pea variety selected for the replicable business model is a medium duration variety that matures in less than 200 days. This reduces the risk of crop damage caused by rains stopping early and increases the chances of getting higher yields.

The strategy employed by farmers to reduce pest damage to crops is not to plant pigeon pea in pure stand but instead to use mixed cropping techniques. The mixed cropping system reduces pest pressure to a level that allows the *Maiwathualimi* variety to grow well without agrochemical inputs or under management with natural pest protection products (neem spray). Farmers confirmed that pest pressure on *Maiwathualimi* in single crop fields is hardly manageable even with the use of agrochemicals. *Maiwathualimi* is not affected by Fusarium wilt and is harvested before livestock are allowed to graze freely. Additionally, the quality seeds distributed are treated (dressed) with fungicide to ensure the crop has a healthy and strong start.

Finally, the *Maiwathualimi* variety cooks fast (in less than one hour), which reduces demand for firewood within the community and slows down environmental degradation.

### 4.4.2 Managing price risks

In a liberalised economy where prices are not controlled or regulated, it is challenging to manage price risks at the local (farm-gate) level. The *Maiwathualimi* variety selected for distribution to farmers ensures that smallholders will produce the variety and quality of pigeon pea that is in highest demand. Producing this variety does not necessarily result in higher producer prices but it does allow for better market access as demand for *Maiwathualimi* is higher among the Indian traders in Blantyre.

### 4.4.3 Managing economic coordination risks

The business model relies on Sukamphete Farmers' Cooperative to coordinate supply of inputs and marketing of harvests. The seeds have been delivered in bulk to the Cooperative and farmers have collected the seeds from the Cooperative. Also, the harvested product will be delivered by the farmers to the Cooperative and the cooperative will be expected to market the product in bulk.

This model reduces the risks of economic coordination because it encourages farmers to act collectively both to purchase inputs and to market the product. It is yet to be tested whether the cooperative will be able to process the pigeon pea harvest and market it at a higher price. The SRMS project will encourage this process and aim to provide some training to selected members of the cooperative – whilst the institution will ultimately remain responsible for implementing the model.



#### 4.4.4 Managing risk of opportunism

The business model utilises the cooperative for supplying inputs and marketing the final product, which reduces the individual farmers' exposure to opportunistic behaviour. Further studies will test the extent to which opportunistic behaviour (in particular by local traders and vendors) can be reduced by collective marketing of products.

### 4.5 Workplan to implement the business model

The table below summarises the activities that will need to be implemented in order to successfully implement the business model described above.

**Table 8: Activities to be performed**

Activity	Date to be completed	Responsible
Registration of 200 farmers	30 September 2017	Sukamphete Cooperative, in collaboration with local authorities (including DADO)
Purchase and delivery of 400 kg treated certified seeds to Sukamphete Cooperative	30 October 2017	OPM Local research assistant
Distribution of 2kg seeds to 200 farmers	15 November 2017	Sukamphete Cooperative Local research assistant Local authority
Planting of certified seeds distributed	31 December 2017	Participating (recipient) farmers
First follow-up visit to farmers	31 January 2018	Local research assistant Agricultural extension staff
Second follow-up visit to farmers	30 April 2018	Local research assistant Agricultural extension staff
Harvesting and return of 8 kg of pigeon pea by each farmer	15 August 2018	Farmers Sukamphete Cooperative
Selection of 400 kg of C1 seed	31 August 2018	Sukamphete Cooperative DADO Local research assistant
Sale of 1,200 kg of pigeon pea	31 August 2018	Sukamphete Cooperative Local research assistant
Business model design / adjustment / review workshop	15 September 2018	SRMS research team Sukamphete Cooperative DADO
Order 100 kg of certified seeds	31 October 2018 (depending on the outcome of the review workshop)	Sukamphete Cooperative

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## Annex A List of interviews conducted in Malawi, 1–8 July 2017 and 4–11 September

No.	Date	Person	Title	Institution	Interviewed by	Location	Phone	Email
1	03-Jul-17	Martin J Kausi	Programme Manager	Blantyre ADD	Zoltan Tiba and Joachim Weber	Blantyre	+265 999 102 455; +265 881 433 824	<a href="mailto:martinkausi@gmail.com">martinkausi@gmail.com</a>
2	03-Jul-17	Handrina Chima	Agribusiness Officer	Blantyre ADD	Zoltan Tiba and Joachim Weber	Blantyre	+265 888 318 146	
3	03-Jul-17	Monica Kulesi	Crops Officer	Blantyre ADD	Zoltan Tiba and Joachim Weber	Blantyre	+265 888 836 699	
4	03-Jul-17	Hisham Jamaldeen	General Manager	RAB Group of Companies	Zoltan Tiba and Joachim Weber	Blantyre	+265 888 824 709; +265 1 845 200	<a href="mailto:gmo@rabmw.com">gmo@rabmw.com</a>
5	04-Jul-17	Venkat Danda	General Manager	HMS (Export Trading)	Zoltan Tiba and Joachim Weber	Blantyre	+265 999 967 500	
6	04-Jul-17	Tinkhani Chinteza	Cereal Officer / Seed multiplication	Blantyre ADD	Zoltan Tiba and Joachim Weber	Blantyre	+265 888 308 695	
7	04-Jul-17	Suzan Chimbayo	Chair	Nandolo Farmers Association of Malawi	Zoltan Tiba and Joachim Weber	Blantyre, T-bone café	+265 999 951 613; +265 993 125 331; +265 888 377 113	<a href="mailto:smchimbayo@gmail.com">smchimbayo@gmail.com</a>
8	04-Jul-17	Henry Chikosa	Operations Manager	Nandolo Farmers Association of Malawi	Zoltan Tiba and Joachim Weber	Blantyre, T-bone café		
9	04-Jul-17	Clement Shawa	Seed Inspector	Bvumbwe Research Station, Ministry of Agriculture	Zoltan Tiba and Joachim Weber	Bvumbwe Research Station	+265 999 735 632	
10	04-Jul-17	Morton Nyirenda	Seed Inspector	Bvumbwe Research Station, Ministry of Agriculture	Zoltan Tiba and Joachim Weber	Bvumbwe Research Station		
11	05-Jul-17	Peter Ngomano	Agric. Extension	Mulanje District	Zoltan Tiba and	Mulanje BOMA	+265 888 609	<a href="mailto:peterngomano@">peterngomano@</a>

			Development Coordinator for Milonde EPA	Agriculture office	Joachim Weber	(DADO)	241	<a href="mailto:yahoo.com">yahoo.com</a>
12	05-Jul-17	Grant Twaya	Agribusiness Officer for Mulanje District	Mulanje District Agriculture office	Zoltan Tiba and Joachim Weber	Mulanje BOMA (DADO)	+265 888 771 004	<a href="mailto:twayagrnt@yahoo.com">twayagrnt@yahoo.com</a>
13	06-Jul-17	David Ali	Assistant DADO	Phalombe District Agriculture Office	Zoltan Tiba and Joachim Weber	Phalombe		<a href="mailto:davidalli12@yahoo.com">davidalli12@yahoo.com</a>
14	06-Jul-17	Henry Moyo	Crops Officer	Phalombe District Agriculture Office	Zoltan Tiba and Joachim Weber	Phalombe		<a href="mailto:henrymoyo4@gmail.com">henrymoyo4@gmail.com</a>
15	06-Jul-17	Lucy Ndiwo	Agribusiness officer	Phalombe District Agriculture Office	Zoltan Tiba and Joachim Weber	Phalombe		<a href="mailto:lucyndiwo@yahoo.com">lucyndiwo@yahoo.com</a>
16	06-Jul-17	Sayamica Matipwiri	Certifying officers	Malawi Bureau of Standards	Zoltan Tiba and Joachim Weber	Blantyre		<a href="mailto:matipwiri1@gmail.com">matipwiri1@gmail.com</a>
17	06-Jul-17	Yamikan Jhonas	Certifying officers	Malawi Bureau of Standards	Zoltan Tiba and Joachim Weber	Blantyre		
18	04-Sep-17	Soka Chitaya	Project Manager	MISST project	Zoltan Tiba and Joachim Weber	Lilongwe	+265 88 590 7684;	<a href="mailto:schitaya@yahoo.com">schitaya@yahoo.com</a> ; <a href="mailto:s.chitaya@cgiar.org">s.chitaya@cgiar.org</a>
19	04-Sep-17	Frazer Mataya	Economist	NASFAM	Zoltan Tiba and Joachim Weber and Alexander Phiri	Lilongwe		
20	04-Sep-17	Kristian Sach Moller	Chief Executive Officer	ACE	Zoltan Tiba and Joachim Weber and Alexander Phiri	Lilongwe		
21	04-Sep-17	Ibrahim Benesi	Chief Executive Officer	MUSECO	Zoltan Tiba and Joachim Weber and Alexander Phiri	Lilongwe	+265 994 870 400; +265 994 870 500; +265 999 474 456	<a href="mailto:ibenesi@gmail.com">ibenesi@gmail.com</a> ; <a href="mailto:benesi@museco.mw.com">benesi@museco.mw.com</a>
22	04-Sep-17	Alexander Chikapula	NASCOMES General	NASFAM	Joachim Weber	Lilongwe	+265 999 003 303; +265 888	<a href="mailto:achikapula@nasfam.org">achikapula@nasfam.org</a>

			Manager				966 443	
23	05-Sep-17	Snowden Mbalafana	Head of Institutional Development	FUM	Zoltan Tiba	Lilongwe	265 992 957 058; +265 997 057 697; +265 888 870 321	<a href="mailto:smbalafana@farmersunion.mw">smbalafana@farmersunion.mw</a>
24	05-Sep-17	Vincent Kiwanuka	P4P Officer	World Food Programme	Zoltan Tiba	Lilongwe		
25	05-Sep-17	Flora Janet Nankhuni	Assistant Professor	Michigan State University / IFPRI	Zoltan Tiba	Lilongwe	+265 995 687 444;	<a href="mailto:nankhuni@msu.edu">nankhuni@msu.edu</a>
26	05-Sep-17	Bob Baulch	Country Director	IFPRI	Zoltan Tiba	Lilongwe		
27	05-Sep-17	Sophie Makoloma	Chief of Party - ECRP	Christian Aid	Zoltan Tiba	Lilongwe	+265 881 188 785; +265 999 208 876	<a href="mailto:smakoloma@christian-aid.org">smakoloma@christian-aid.org</a>
28	05-Sep-17	Dimitrij	General Manager	Farmers' World	Zoltan Tiba	Lilongwe		
29	06-Sep-17	Kamesh K.	General Manager	Kamit Industries Ltd	Zoltan Tiba and Joachim Weber	Blantyre	+265 111 400 088; +265 99 122 1234	<a href="mailto:info@kamitie.com">info@kamitie.com</a> ; <a href="mailto:kamesh.kallepalli@gmail.com">kamesh.kallepalli@gmail.com</a>
30	06-Sep-17	Martin Kausi	Manager, Blantyre ADD	Blantyre ADD	Zoltan Tiba & Joachim Weber	Blantyre		
31	06-Sep-17	N. D. Patel	General Manager	Atlas Trading	Zoltan Tiba and Joachim Weber	Blantyre	+265 1 841 341; +265 1 820 1545	
32	07-Sep-17	Venkat Danda	General Manager	HMS (Export Trading)	Zoltan Tiba and Joachim Weber	Blantyre	+265 999 967 500	
33	07-Sep-17	Jack Nkombezi	DADO, Phalombe	Phalombe District Agriculture Office	Zoltan Tiba and Joachim Weber	Phalombe		
34	28-Sep-17	Grey Nyandule Phiri		Ministry of Agriculture	Alexander Phiri	Lilongwe		

No.	Date	Person	Title	Institution	Interviewed by	Location	Phone	Email
<b>FGDs and workshops with farmers' cooperatives</b>								
FGD	05-Jul-17	<i>Namulenga Producers and Marketing Cooperative Society Ltd</i>				Nkando Village, Thuchila EPA		
		Joseph Makweya	Chair of Marketing				+265 884 823 646	
		Modesta Chumba	Chair				+265 888 328 602	
		Harrison Makaluka	Vice Chair					
		Simon Nkhawe	Treasurer					
		Makrolex Mauzi	Vice Secretary					
FGD	05-Jul-17	<i>Ndanga Village, Sub-TA Ndanga, Mulomba EPA, Mulanje District</i>						
FGD	05-Jul-17	<i>Sukamphete Cooperative - Pigeon Pea Processing Unit</i>				Ligora village, Tamani EPA, Phalombe District		
		Peter Soko	EPA officer				+265 999 355 753	
		Mary Rikanje	Chair of Cooperative				+265 999 567 378	
FGD	05-Sep-17	<i>Sukamphete Cooperative - Pigeon Pea Processing Unit</i>						
		Mary Likanje	Secretary				+265 999 56 73 78	
		Daniel Noah	Constituency Governor, Phalombe North			+265 996 22 94 61		
		Charles	Agriculture					

		Mphona	Division Officer, Timani EPA, Jenala TA, Phalombe District					
W'shop	08-Sep-17	<i>Sukamphete Cooperative Workshop</i>						

No.	Date	Person	Title	Institution	Interviewed by	Location	Phone	Email
<b>Warehouses visited</b>								
1	05-Jul-17	Joseph Koromana	Warehouse Manager	Agricultural Commodity Exchange	Zoltan Tiba and Joachim Weber	Mulanje Warehouse	+265 992 679 289	
2	07-Sep-17	Sinai Mwangomba	Officer	Malawi Enterprise Productivity Enhancement Project	Phalombe Warehouse	+265 999 390 710		

No.	Date	Person	Title	Institution	Interviewed by	Location	Phone	Email
<b>Traders / shops / local markets visited</b>								
1	05-Jul-17	Zikomenso market, Mulanje						
2	06-Jul-17	Mnkando Market, Tuchila EPA, Mulanje						
3	07-Jul-17	market outlets	Shoprite, PTC, Metro					
4	08-Jul-17	Chitakale market, Mulanje District						
5	05-Sep-17	Jali Market, Ngwelero EPA, Machinga ADD, Zomba District	Jali, Zomba District					
6	05-Sep-17	Roadside Traders	Matiya Area, Ngwelero EPA,					

			Machinga ADD, Zomba district					
7	06-Sep-17	Phalombe Market (Boma)						

No.	Date	Person	Title	Institution	Interviewed by	Location	Phone	Email
<b>Individual farmers interviews and field visits</b>								
1	05-Jul-17	Dani Kumbe	Ndanga Village, Mulomba EPA, Mulanje District, Blantyre ADD					
2	05-Jul-17	Gloria Herbert	Ndanga Village, Mulomba EPA, Mulanje District, Blantyre ADD					

No.	Date	Person	Title	Institution	Interviewed by	Location	Phone	Email
<b>List of people contacted by email / phone</b>								
1		Peter Whyte		ACE		Lilongwe	+265 998 944 839	
2		Abbie Morris		ACE			+265 999 012 006	
3		Adrian Semba	Farmers / Rural Marketing Adviser	ACE				
4		Erik Haraman	Deputy Programme Manager	Blantyre ADD		Blantyre	+265 999 102 658	
5		Victoria Kanyuka	Shoprite Manager, Zomba			Zomba		
6		Mr Chiwaya	PTC Buyer Manager				+265 885 908 275	

No.	Date	Person	Title	Institution	Interviewed by	Location	Phone	Email
<b>Further potential contacts</b>								
		Arthur		Business Innovation Facility		Blantyre	+265 999 200 861; +265 888 396 171	
		Alex		Business		Blantyre		



				Innovation Facility				
		Richard		Business Innovation Facility		Lilongwe		
		Ezara Mbendera	DADO, Mwanza District				+265 881 874 289	
							+265 993 898 215	
		Enford Kanyimbo	DADO, Mulanje District				+265 992 748 445	
							+265 888 505 190	
		Jack Nkombezi	DADO, Phalombe District				+265 994 069 875	
							+265 888 366 095	

## Annex B Questionnaire forms for distribution

Ndandanda wa anthu olandira mbewu m'mudzi wa \_\_\_\_\_.

	Dzina la mutu wa banja	Mamuna / Mkazi	Chiweringero cha anthu pa nyumba	Membala wa Sukamphete (chongani inde / ayi)	Kukula kwa munda	Tsiku loandira mbewu	1kg Maiwathu alimi (chongani)	1kg Chitedze (chongani)	Sayini ya mulimi	Tsiku lobwedza nandolo 4kg	Sayini ya wa pampando wa Sukamphete
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											

Ine, amfumu \_\_\_\_\_, ndikusimikiza kuti anthu a m'mudzi wanga alandira mbewu yokwanira \_\_\_\_\_.

## **Annex C    Semi-structured questionnaires for stakeholder interviews**

The key informant interviews were conducted in a semi-structured way to allow participants to express their views freely. The following questions were asked during the interviews:

1. Please describe your actual and historic involvement in the pigeon pea value chain (e.g. production area, volume and prices; consumed, traded, stored and processed volume; trading partner within the value chain; other partners and services in the value chain; training and extension activities).
2. Where do you see opportunities to improve your involvement in the pigeon pea value chain (e.g. additional resources; infrastructure development; policy framework)?
3. Are you aware of other pigeon pea promotion projects?
4. Please describe the pests and diseases you have encountered recently.
5. What are the cost of the activities you perform within the value chain (actors only)

## Annex D Gross margin calculations

**Sample 1: 2,582 m<sup>2</sup> land holding, of which 60% maize and 40% local pigeon pea intercropped**

Item	Number	Unit price	Total	Share for pigeon pea area 40%
Land preparation	18 man days	MWK 1,000	MWK 18,000	MWK 7,200
Seed pigeon pea	6 kg	MWK 500	MWK 3,000	MWK 3,000
Planting	7 man days	MWK 500	MWK 3,500	MWK 3,500
First weeding	18 man days	MWK 500	MWK 9,000	MWK 3,600
Second weeding	18 man days	MWK 500	MWK 9,000	MWK 3,600
Persistent weeds removal	4 man days	MWK 1,000	MWK 4,000	MWK 1,600
Harvesting	2 man days	MWK 500K	MWK 1,000	MWK 1,000
<b>Total cost of pigeon pea production</b>				<b>MWK 23,500</b>
	Pigeon pea harvested	Pigeon pea price	Total income	
Gross margin	200 kg	MWK 200	MWK 40,000	<b>MWK 16,500</b>
Break-even price		<b>MWK 117.5</b>	MWK 23,500	


**Sample 2: 8233 m<sup>2</sup> maize, millet, local and improved pigeon pea intercropped**

Item	Number	Unit price	Total	Share for pigeon pea area 20%
Land preparation	40 man days	MWK 1,000	MWK 40,000	MWK 8,000
Seed pigeon pea	3 kg	MWK 500	MWK 2,500	MWK 2,500
Planting	3 man days	MWK 500	MWK 1,500	MWK 1,500
First weeding	60 man days	MWK 1,000	MWK 60,000	MWK 12,000
Second weeding	50 man days	MWK 1,000	MWK 50,000	MWK 10,000
Harvesting	3 man days	MWK 500	MWK 1,500	MWK 1,500
<b>Total cost related to pigeon pea production</b>				<b>35,500</b>
	Pigeon pea harvested	Pigeon pea price		
Gross margin	kg	MWK	15,000 MWK	<b>MWK -(20,500)</b>
Break-even price		<b>MWK 473</b>		


**Sample 3: Gross margin calculations by Phalombe DADO****Gross margin for pigeon peas enterprise: 1 hectare****Income: Irodgers Namatosa – Subiri Village**

QUANTITY SOLD		PRICE	VALUE
1,000 KG		MWK 300.00/bag	MWK 300,000.00
Total income from sales			MWK 300,000.00
Variable costs:			
ITEM	QUANTITY	UNIT PRICE	TOTAL COST
Clearing			MWK 18,500.00
Ridging			MWK 18,500.00
Planting			MWK 3,750.00
1 <sup>st</sup> weeding			MWK 18,500.00
2 <sup>nd</sup> weeding			MWK 18,500.00
De-suckering			MWK 2,500.00
Harvesting			MWK 37,500.00
Transport	20 bags	MWK 250.00/bag	MWK 5,000.00
Drying			MWK 2,500.00
Threshing/beating			MWK 7,500.00
Winnowing			MWK 7,500.00
Sacks	20 sacks	MWK 150.00/sack	MWK 3,000.00
Actelic purchase	3 bottles	MWK 1,300.00	MWK 3,900.00
Actelic application			MWK 1,000.00
Packing			MWK 500.00
(B) Total variable costs:			MWK 148,650.00
NET=A-B			MWK 151,350.00
B.E.Y (Break-even yield)		VC/P	Kg 495.51
B.E.P (Break-even price)		VC/Y	MWK 148.65

## Annex E Minimum price announcement, April 2017



**BOMA LA MALAWI**



**UNDUNA WA MALIMIDWE,  
ULIMI OTHIRILA NDI  
CHITUKUKO CHA MADZI**

### CHIDZIWITSO

## MITENGO YA MBEU YA CHAKA CHA ULIMI CHA 2016/2017

Unduna wa Malimidwe, Ulimi Othilira ndi Chitukuko cha Madzi ukudziwitsa alimi ndi anthu onse mdziko muno kuti mitengo Yogulira mbeu kwa alimi chaka chino cha 2016/2017 kuyambila pa **1 April, 2017** ikhala motere:

MBEU	MTENGO WA MBEU (Chaka chino) 2016/2017 (MK/KG)
Chimanga	170
Mpunga Wopuntha	450
Mpunga Wosapuntha	230
Mapira	190
Mawere	130
Mchewere	160
Tirigu	250
Soya	280
Nyemba - Mtundu umodzi	300
Nyemba - Mitundu yosakaniza	250
Ntedza - Osenda	400
Ntedza - Osasenda	290
Nondolo	320
Khobwe	230
Mphozo	200
Nzama	250
Tchana	300
Chitowe	250
Nsatsi	200
Mpendadzuwa	300
Tsabola wa Papurika	Giledi A 650
	Giredi B 600
Tsabola wa Mpiripiri	Giledi A 900
	Giredi B 800
Chinangwa - chowuma	210
Chinangwa - chachiwisi	40

Undunawu ukupempha onse okhuzidwa ndi kugula mbeu zosiyana siyana kwa alimi kuti agule mbeu pa mitengo yosachepera imene yalengezedwa pa chidziwitsochi.

Ma Licence ogulira mbeu mungathe kuwapeza ku maofesi a ma Programme Manager ku Karonga, Mzuzu, Kasungu, Lilongwe, Salima, Machinga, Blantyre, Shire Valley ndi ku ofesi ya Mulangizi wa Mkulu wa mbeu ku Unduna wa Zamalimidwe, Ulimi othilira ndi Madzi, ku Capital Hill, Lilongwe.

Ngati mungafune kudziwa zambiri, chonde yankhulani ndi: **Dr Godfrey Ching'oma**.

## Annex F Pictures from the fieldwork

### Value Chain Workshop: Sukamphete Cooperative (Chitekeza Village, 8 September 2017)



### Focus Group Discussion: Ndanga Village Cooperative (Mulomba EPA, 5 July 2017)



**Market outlet in Phalombe District**



**Pigeon pea field in Phalombe District**



**Red and white varieties of pigeon pea produced in Phalombe District**

