U.S. GLOBAL DEVELOPMENT LAB Powered by USAID

MICHIGAN STATE UNIVERSITY | Global Center for Food Systems Innovation

GENDER ANALYSIS OF THE PIGEON PEA VALUE CHAIN: CASE STUDY OF MALAWI

Nathalie Me-Nsope and Michelle Larkins

Center Report Series No. 5
ISBN: 978-0-9903005-5-7

Gender Analysis of the Pigeon Pea Value Chain: Case Study of Malawi
ISBN: 978-0-9903005-5-7

Copyright © 2014 by Global Center for Food Systems Innovation (GCFSI). This publication was funded by the United States Agency for International Development – Global Development Lab.

All rights reserved. This book or any portion thereof may not be reproduced or used in any manner whatsoever without the express written permission of the publisher except for the use of brief quotations in a book review.

Please cite as: Me-Nsope, Nathalie and Michelle Larkins. 2015. Gender Analysis of the Pigeon Pea Value Chain: Case Study of Malawi. Center Report Series, No. 4. Global Center for Food Systems Innovation, Michigan State University, East Lansing, Michigan, USA.

DISCLAIMER

The contents of this document are the sole responsibility of the Global Center for Food Systems Innovation at Michigan State University and do not necessarily reflect the views of the United States Agency for International Development or of the United States Government.

Global Center for Food Systems Innovation
Michigan State University
308 Manly Miles Building
1405 S. Harrison Road
East Lansing, Michigan 48823-5243
The United States of America
www.gcfsi.isp.msu.edu
gcfsi@msu.edu

GENDER ANALYSIS OF THE PIGEON PEA VALUE CHAIN: CASE STUDY OF MALAWI

Nathalie Me-Nsope and Michelle Larkins

2015

Center Report Series No. 5

Global Center for Food Systems Innovation, Michigan State University

EXECUTIVE SUMMARY

The purpose of this study was to contribute knowledge that will help the Global Center for Food Systems Innovation (GCFSI) to answer its pilot implementation question in Malawi of "Where and how can multipurpose legumes be scaled for sustainable intensification of maize systems and what would the potential impacts be, in the medium term, across the food system in Malawi?" The research focused on pigeon pea as a multipurpose legume. A gender analysis of this value chain was based on our recognition that from production to processing, gendered patterns of behavior and resource allocation condition the activities of men and women value chain actors, the distribution of resources and benefits derived from value chain activities, and the efficiency and competitiveness of the value chain. Efforts to scale multipurpose legumes must isolate the gender-based constraints from general barriers in order to address gendered implications for adoption and expansion of the pigeon pea at the farm level. Gendered incentives to participate at post-production levels of the value chain are also needed. This improves the design and targeting of solutions to address constraints at both levels.

We analyze the pigeon pea value chain using a rapid assessment approach and the Integrating Gender into Agricultural Value Chains (INGIA-VC) analytical framework. Specifically, the Gender Dimension Framework is used to collect and organize data necessary to understand gender relations and roles along this value chain. The data is analyzed to identify gender-based constraints with implications for value chain development. Fieldwork was conducted in the North, Central, and South regions of Malawi. The research team consisted of three faculty members and three graduate students from the Lilongwe University of Agriculture and Natural Resources (LUANAR)[1] in Malawi, and a faculty member and a graduate student from GCFSI. Using a semi-structured interview guide, data were collected at each node of the pigeon pea value chain.

The findings reveal an opportunity to expand pigeon pea production in Malawi, particularly in the North region where land is not a limiting factor. However, this will require improving farmers' access to high-yielding seeds as well as to markets. In the South and Central regions, where land is limited and farmers grow crops on very small parcels of land, it will be necessary to expand farmers' access to short season, pest resistant, high-yielding seed varieties.

Overall, we find that for adoption and expansion of pigeon peas to take place, the reliability of the seed systems must be improved. Innovations of particular importance are those that support local and/or private sector involvement in seed production, promote farmers' access to profitable markets, stimulate farmers' demand for certified seeds, and support the delivery of seeds to farmers. The design of such innovations must consider existing gender disparities in resources required to participate in markets as well as cultural restrictions on women's mobility.

[1] We extend a special thanks to Dr. Judith Kamoto, Dr. Catherine Mthinda, Mrs. Zione Mbewe, Franklin Chilomba, Frank Musa and Vinjeru Nyirenda (LUANAR); and Danielle Ami-narh (MSU) for participating in this fieldwork.

A gender mapping of the value chain reveals that women are concentrated at points along the value chain with minimal resource requirements. The gender division of roles and responsibilities confers upon women the responsibility for household chores and childcare, thereby restricting their participation to points along the value chain that allows them to perform their culturally defined roles. Gender disparities in access to resources or opportunities for income generation limit business investments for women actors and have implications for the profitability of participating in the chain. Scaling pigeon pea would necessitate identifying innovative ways of enhancing women's access to business related resources (finance, business training), and more importantly, improve their role in decision-making and control over those resources. Furthermore, their ability to participate in the value chain at a more robust scale is hampered by transportation constraints because of safety concerns, inability to leave home for several days at a time, and lack of access to mechanized transport such as bicycles. Without access to reliable and safe transportation, they cannot participate in markets, even if these scaled-up markets were to exist.

Gendered priorities within the household, gender differences in preferences for different crops, and gender inequalities in control over household production resources have implications for farm investment decisions, particularly in the allocation of land, labor, inputs, and other resources to different crops. Innovations to scale out this legume must consider intra-household decision-making processes and gender relations with implications for adoption and expansion of the legume. Women play an important role in the cultivation of pigeon pea. Intra-household gender relations that give men/husbands control over income generated from women's labor and allow expenditure behaviors that do not reflect the needs of all household members weaken the incentives to expand production beyond household consumption needs.

Women farmers are more knowledgeable about pigeon pea and play an important role in seed selection and storage; however, our findings indicate that men would appropriate the crop if access to profitable markets is improved, which signals an opportunity to increase women's income by involving them in local seed production. Additionally, innovations that support women farmers to participate in downstream activities such as small-scale processing of pigeon pea are likely to increase returns, since the retail price is about thrice the farm gate price.

Access to price information was identified as a critical resource along the value chain. Frequent price fluctuations and price information asymmetries imply that innovations to improve the efficiency of trade and the wellbeing of value chain actors must support reliable access to price information and must consider any gender differences that exist in the use of various information channels in design and targeting. We identified common sources of information for actors at different stages of this value chain. However, it is unclear if any gender differences exist in the use of these information channels.

We find that the practice of individuals selling small quantities, frequent price fluctuations, and the tendency for vendors and buyers to offer low prices to farmers (especially women) act as a disincentive to expanding production of the legume. Group/collective action has potential to

increase farmers bargaining power, increase volume available for sale, fetch better prices, and enlarge access to capital, thereby supporting investments in storage infrastructure, business training, and other resources necessary to ensure the profitability of their activities. Group action could be particularly beneficial to women who face mobility constraints. However, its design must not reinforce unequal gender relations and must promote gender equitable benefit sharing mechanisms.

Pest damage is a major threat to pigeon pea in Malawi. Farmers' lack of knowledge of appropriate planting intervals and other production techniques hinders effective pesticide application and yields. Innovative ways of building farmers' capacity for pigeon pea production as well as education on profitable crop diversification techniques would also be very useful in efforts to scale out the legume.

Overall, efforts to scale multipurpose legumes to improve the food security, nutrition, and poverty situations of poor households in Malawi must consider intra-household dynamics and gender relations that give men the privilege to control income from pigeon pea sales and shape whether or not expansion in pigeon pea production could contribute to improved food security and poverty reduction within the household. As noted by the research of Bezner-Kerr et al. (2013) and many others, the relationship between gender [in]-equality and food systems innovation and nutrition is well documented. This body of literature demonstrates that gains in nutrition and food security are closely tied to the achievement of gender equality. In communities where men and women share rights and responsibilities, and women are given access to resources, the likelihood for success of food security programs is increased. Empowering women economically is essential for harvesting the potential food security and poverty reduction benefits of legume expansion and commercialization.

EXECUTIVE SUMMARY V
LIST OF TABLES XI
LIST OF FIGURES XI
ACRONYMS XII
1. INTRODUCTION 13
1.1 LEGUME INTENSIFIED SYSTEMS IN MALAWI 13
1.2 GENERAL FACTORS LIMITING LEGUME ADOPTION AND EXPANSION 14
1.3 RATIONALE FOR THE STUDY 15
2. RESEARCH METHODOLOGY 17
2.1 SITE SELECTION 17
2.2 CONCEPTUAL FRAMEWORK 18
2.3 IMPLEMENTATION 20
3. FINDINGS AND DISCUSSION 22
3.1 SEED SYSTEM ACTORS 22
3.2 FARMERS/PRODUCERS 26
3.2.1 Seed Quantity and Quality 27
3.2.2 Labor 28
3.2.3 Land 29
3.2.4 Marketing 31
3.2.5 Control over Income/Revenue 35
3.2.6 Pest, Disease, and Livestock Damage 36
3.2.7 Knowledge about Pigeon Pea, Participation in Training, and Market Information 36
3.3 PIGEON PEA MARKETING COOPERATIVE 37
3.4 RETAILERS AND LOCAL PROCESSORS 38
3.4.1 Motivation, Participation, and Business Ownership 38
3.4.2 Access to Credit/Finance 40
3.4.3 Labor/Time 42
3.4.4 Market Information 43
3.4.5 Business-Related Training 43
3.5 BUYERS AND TRADERS 43
3.5.1 Participation and Business Ownership 44
3.5.2 Access to Capital/Finance 45
3.5.3 Storage 46
3.5.4 Transportation 46
3.5.5 Mobility Constraints 46
3.5.6 Labor 47
3.5.7 Business Knowledge, Bargaining, and Negotiation Skills 47
3.5.8 Access to Market Information 49
3.6 LARGE-SCALE BUYERS AND PROCESSORS 49
3.6.1 Operation 50
3.6.2 Pigeon Pea Varieties and Quality 50
3.6.3 Procurement of Pigeon Pea Supplies 51
3.6.4 Buying Price Determination Process 51

3.6.5 Business Requirements for this Stage.....*52*
4. OPPORTUNITIES AND CHALLENGES.....52
5. CONCLUSIONS AND IMPLICATIONS FOR FOOD SYSTEMS INNOVATIONS.....53
APPENDIX A 57
REFERENCES.....75

LIST OF TABLES

TABLE **PAGE**

Table 1. Data Collection 21
Table 2. Challenges in the Pigeon Pea Seed System in Malawi 26
Table 3. General Constraints in Pigeon Pea Production and Marketing 32
Table 4. Gender-Based Constraints in Pigeon Pea Production and Marketing 34
Table 5. Constraints in Pigeon Pea Retailing and Local Processing 40
Table 6. Challenges in Pigeon Pea Buying and Trading 45

LIST OF FIGURES

FIGURE **PAGE**

Figure 1. Extension Worker Showing GCFSI Team a Pigeon Pea Farm 15
Figure 2. Districts Selected for GCFSI Study in Malawi 18
Figure 3. Producers of Pigeon Peas, Mzimba North District 21
Figure 4: Map of the Pigeon Pea Value Chain in Malawi 22
Figure 5. Woman Retailing Legumes in Malawi. Source: GCFSI graduate assistant Danielle Aminarh 43
Figure 6. GCFSI Graduate Research Assistant, Danielle Ami-narh Interviewing a Pigeon Pea Buyer/trader in Thyolo District 49
Figure 7. Women Producers of Pigeon Peas in Ndilema Village, Dedza District, Central Malawi 52

ACRONYMS

AGRA	Alliance for Green Revolution in Africa
ASSMAG	Association of Smallholder Seed Marketing Action Group
CARD	Center for Agricultural Research and Development
EPA	Extension Planning Areas
ETG	Export Trading Group
FGDs	Focus Group Discussions
FHH	female-headed households
FTF	Feed the Future
GBCs	gender-based constraints
GBOs	gender-based opportunities
GCFSI	Global Center for Food Systems Innovation
GDF	Gender Dimensions Framework
GOM	Government of Malawi
HH	household head
ICRAF	International Center for Research in Agroforestry
INGIA-VC	Integrating Gender in Agricultural Value Chains
INGIA-VC	Integrating Gender into Agricultural Value Chain
kg	kilogram
LUANAR	Lilongwe University of Agriculture and Natural Resources
MHH	male-headed household
MK	Malawian Kwacha
NASFAM	National Smallholder Farmers Association of Malawi
NGO	non-governmental organization
U.K.	United Kingdom
U.S.	United States
USAID	United States Agency for International Development

1. INTRODUCTION

As part of its year two implementation, effort in East/South Africa, the Global Center for Food Systems Innovation (GCFSI) funded nine research projects. Each was to contribute to answering the question, "Where and how can multipurpose legumes be scaled for sustainable intensification of maize systems and what would the potential impacts be, in the medium term, across the food system in Malawi?" Specifically, in the summer of 2014, each project conducted research to inform the process of identifying and designing innovative solutions to address the challenges associated with scaling multipurpose legumes in Malawi to improve food security and reduce poverty or take advantage of existing opportunities for scaling. This report documents the findings from one of the nine GCFSI research projects in Malawi, titled "Gender Analysis of the Pigeon Pea Value Chain: Case Study of Malawi."

1.1 Legume Intensified Systems in Malawi

Smallholder agriculture remains an important source of livelihoods for a majority of the rural population of Malawi (Chirwa and Matita 2012). The majority of smallholder households cultivate small farm sizes (1–2 hectares per household), placing them at the margins of subsistence (Snapp et al. 2002). Poverty and food insecurity remain major challenges in Malawi. These challenges are further exacerbated by changing climates, rising population densities, and increasing pressure on land. As in most of Southern Africa, maize is the dominant cropping system in Malawi. Maize accounts for 60-80 percent of the area sown, the remainder of smallholder arable land is sown in tobacco, groundnuts, pigeon pea, and other crops (Snapp et al. 2002). The majority of smallholder farmers rely on maize harvests as their main food crop—97 percent of farmers grow maize (Rubin 2009).

Concerns about the food security implications of declining soil fertility due to continuous cropping with cereals, minimal use of fertilizers (due to high cost), and the abandonment of the traditional fallow systems which allowed the soil to recover from several years of cropping in Malawi (Mafongoya et al. 2006; Snapp et al. 2002) has sparked great interest in legume-intensified maize systems as an alternative soil fertility technology. Commonly grown legumes in Malawi include bean, soybean, cowpea, and pigeon pea, frequently grown as intercrops in Southern Malawi, whereas sole stands of groundnut and Bambara groundnut are typical of Northern Malawi (Mhango et al. 2012).

Research conducted in recent decades has shown that legume-intensified systems can enhance soil productivity through biological nitrogen fixation, carbon inputs, and conservation of nutrients (for example, Snapp et al. (1998) and Snapp et al. (2002)). Added to the soil fertility gains, legume-intensified maize systems are also advocated for their nutritional value (Makoka 2009). Concerns about malnutrition in Malawi (FAO) and poverty have spurred interest in legumes as a potential solution to malnutrition for low-income households. In comparison to the dominant maize crop, protein-rich grains of legumes have been argued to prevent malnutrition commonly associated with cereal-based diets (Prasanna et al. 2001). Pigeon pea grain for instance, has a high protein content of 21 to 25 percent (Simtowe et al. 2009), making it a valuable source of protein for many poor

families who cannot afford other sources of protein, such as dairy and meat.

Further, legumes are thought to have potential to improve food security and reduce poverty rates among vulnerable farmers. Mhango, et al. (2012) note that "Legume diversification of maize-based systems is a core example of sustainable intensification, with the food security of millions of farm families at stake." Legumes can provide market possibilities, thereby providing farmers the opportunity to improve their income and livelihoods (Giller et al. 2011; Kamanga et al. 2010), which is needed to combat hunger and malnutrition besides an increase in total food production (Bie 2008; De Schutter 2010).

Pigeon pea is an important multipurpose shrub legume in Malawi; attractive to smallholders for its multipurpose characteristics—dried seed, pods and immature seeds used as green vegetables, leaves and stems used for fodder and the dry stems as fuel (Simtowe et al. 2009), and its soil fertility benefits (Snapp et al. 2002). The legume is also highly drought tolerant (compared to maize, tobacco and cotton), and their long taproot is advantageous in accessing nutrients in deeper soil profiles (Snapp et al. 2003). Malawi ranks first in terms of pigeon pea production in Africa, and it is the third largest pigeon pea producer in the world, behind India and Burma (FAOSTAT 2012).

1.2 General Factors Limiting Legume Adoption and Expansion

In spite of the potential benefits of legume intensified maize systems as a whole, adoption levels remain low (Kanyama-Phiri et al. 2000). Existing literature identifies several factors limiting legume adoption and expansion. As mentioned by Snapp et al. (2002), food security in Malawi is commonly equated with maize harvest. Poor farmers prefer to avoid having to purchase part of their maize requirement in the market. Bezner-Kerr et al. (2013) also observes that Malawian farmers define the boundaries within which legumes can expand on their farm by food security and income. The cultural dependency on maize is reflected in the priority of the crop in terms of labor and allotment of cultivated area; and this dependency is noted to diminish the potential that legumes will be added to crop rotations throughout Malawi (Simtowe et al. 2009; Alwang and Siegel 1999). Snapp et al. (2002) observes that most farmers would be interested in expanding legumes when domestic maize production is sufficient to satisfy household demand.[2]

A household's resource endowment also influences the decision to adopt or expand legumes. Snapp et al. (2002) found that in highly populated areas legumes were most likely to be grown by farmers owning and planting a larger land area. Bezner-Kerr et al. (2013) found that low resource endowed households, who are generally less food secure, are further constrained in their ability to expand legume production due to lack of cash for seeds, limited land and labor. Growing population densities and increasing pressure on land are trends that are likely to further reduce the size of smallholder arable land, thereby limiting legume intensification.

Furthermore, lack of reliable access to seeds also constrains legume adoption and expansion. According to Simtowe et al.

[2] At least 50 percent of the cropped area, and over 70 percent of cropped land where farmers sow relatively smaller quantities of land (Snapp et al. 2002)

(2009), the seed market in Malawi is characterized as informal, with most smallholders recycling their seeds, or trading with other producers. Almost no private sector exists and the public sector fluctuates. Snapp et al. (2002) found that even with very small land sizes, farmers were still unable to plant all the land because of lack of seeds and farm labor. Not only are legume seeds expensive, they do not store well and are difficult to multiply (Snapp et al. 2002).

Limited access to markets, government institutions, and other sources of

Figure 1. Extension Worker Showing GCFSI Team a Pigeon Pea Farm

agricultural supports, which are due to the fact that most farmers live in remote areas, act as disincentives for legume adoption and expansion (Mhango et al. 2012). Further, farmgate prices for legumes are not always competitive, thereby hindering the expansion of legumes. Farmgate prices for grain legumes tend to be relatively uniform across the country, whereas retail prices vary markedly. In fact, a three-fold difference between farmgate and retail prices is not uncommon (Phiri et al. 1999). As observed by Mhango, et al. (2012), legumes compete with other crops for cultivated area, labor, and cash resources. As a result, unless the relative profitability of the legumes improves, the probability of a significant expansion of the legumes appears limited. Not only are farmgate prices low, but farmers have limited access to commodity price information, and to more commercially desirable grade and cultivar seeds (higher premium), thereby further discouraging adoption and expansion (Makoka 2009).

Insect pest and livestock damage are other commonly cited disincentives to the adoption of legumes. Specifically, for pigeon peas, insect pest damage is not only a problem when the grain is on the field, but has been identified as an important cause of post-harvest losses (Snapp et al. 2002; Kanyama-Phiri et al. 1998; Snapp and Silim 1999). Snapp et al. (2002) observe that the introduction of pigeon pea in Mangochi (South) was most threatened by the common practice of open grazing of livestock after the maize harvest.

1.3 Rationale for the Study

While the above-mentioned general limitations or barriers to pigeon pea production are very important, the diversity among smallholder farmers requires that efforts geared towards scaling up legume production identify and address the specific challenges faced by the various actors in the value chain. Gender is an important source of variation among smallholder farmers. As observed by Makoka (2009), a unique characteristic of the pigeon pea value chain in Malawi is that small-scale pigeon pea production is dominated by females. As in most Sub Saharan African countries, women also play an important role in informal food distribution and processing.

Value chains are not gender neutral, but exist and operate within a given social context that affects the distribution of resources, benefits, and opportunities.

Access to resources (physical, financial, human, time, information, and skills) is critical to value chain participation. Gendered patterns of resource allocation quite often imply gender differences in participation as well as in the sharing of benefits based upon participation. In Malawi, Bezner-Kerr et al. (2013) observes that women's agency and access to agricultural resources are very limited. Not only do rural Malawian women have less access to education, they also have limited access to land, credit, seeds, and other agricultural resources in comparison to men. Women are also constrained by highly unequal workloads, including agricultural labor, household tasks, and childcare responsibilities.

Further, as observed by Sebstad and Manfre (2011), gender-defined roles and responsibilities in value chains and within households affect access to financial services, control over income, access to and use of new technologies, inputs, and social services. Gender relations, the specific social relationships (quite often unequal) that exist between men and women (Rubin et al. 2009), affect, and are affected by the ways in which value chains function (Matua, et al. 2014). According to Matua et al. (2014), while value chains offer tremendous opportunities for men and women through better market linkages and employment opportunities, at the same time, the way these value chains operate can affect some groups negatively.

Studies that systematically investigate gender issues along the value chain for implications to adoption and expansion are nearly non-existent. The few studies that exist have mostly focused on the production stage of the value chain. For example, Snapp et al. (2002) found that larger plot sizes in male-headed households (MHH) in Chisepo (Central) than in the female-headed households (FHH) in Mangochi (South) explained the greater likelihood to grow legumes among MHH (larger farm sizes). Further, labor constraints were frequently cited by FHH, whereas MHH were likely to attribute fallows to problems of fertilizer access. Additionally, more MHH than FHH used seeds that were purchased in the market (vs. recycled seeds perceived to be inferior) and received agricultural credit.

The main objective of this study is to analyze the pigeon pea value chain in Malawi using a gendered approach. Specially, the study examines for each node along the pigeon pea value chain, gender issues that have implications for the scaling of this multipurpose legume as well as for the contribution of this legume to household food security and income. We map existing gender relations and roles along the pigeon pea value chain; analyze gender roles and relations to identify gender- based constraints[3] (GBCs) or gender-based opportunities (GBOs); determine the implications of the GBCs or GBOs for participation at the different nodes of the pigeon pea value chain as well as for the sharing of benefits from participation. Overall, the study will provide critical input for the design of innovations targeting food security and poverty reduction in low-income farm households in Malawi by scaling pigeon pea production and commercialization.

The rest of the document is structured as follows: research methodology, findings

[3] These are restrictions on men's and women's access to resources or opportunities that are based on their gender roles or responsibilities (Rubin et. al. (2009).

and analysis, conclusions and implications, and next steps.

2. RESEARCH METHODOLOGY

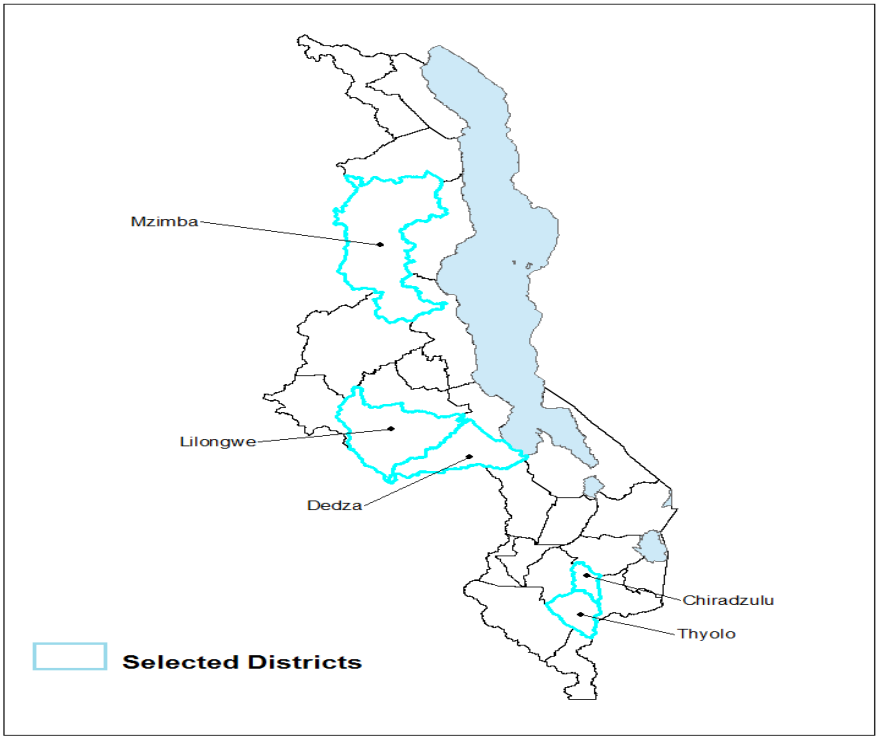
2.1 Site Selection

Fieldwork for this research was conducted in the North, Central, and South regions of Malawi. Production statistics from Malawi's IHC 2010/2011 data revealed that total annual pigeon pea production is highest in the South (361,885,741 kilograms), followed by the Central (7,802,141 kilograms), and then the North (392,044 kilograms) (Tschirley 2014). The selection of districts per region was based on district-level total annual production statistics from the IHC 2010/2011 data as well as stakeholders' opinion. The goal was to identify not only major pigeon pea producing districts, but also emerging pigeon pea producing districts, particularly in the Central and North regions.

Figure 2 is a map of Malawi showing the five districts selected for this research. Within each district, one or two Extension Planning Areas (EPA) were selected. Specifically, in the North, we picked the district of Nzimba North. Based on the 2010/2011 IHC data, total annual pigeon pea production in this district was at 298,000 kilograms (Tschirley 2014), which was highest in the region.[4] The two EPAs selected in the district of Nzimba North were Ensizini and Zombwe. In the Central, the two districts selected were Dedza and Ntcheu. Based on the IHC 2010/2011 data, pigeon pea production for these districts were estimated to be close to zero. However, stakeholder consultations revealed that some of the pigeon pea consumed in the Lilongwe district came from Dedza and Ntcheu. Discussions with export market buyers in the South also revealed they outsourced pigeon pea from Dedza. Furthermore, the presence of several NGOs as well as research projects and organizations (e.g., Africa Rising, the International Center for Research in Agroforestry (ICRAF)) in Dedza and Ntcheu districts that are promoting legume production either for agroforestry or soil-fertility reasons was mentioned to have led to increased pigeon pea cultivation over time. In Dedza, the two selected were Golomoti and Mtakataka while in Ntcheu district Nsipe and Kandeu were selected. In the South of Malawi, the

[4] During our interactions with stakeholders it was revealed that more recent production statistics show higher levels of production in Karonga district than in Mzimba North. In the absence of any formal statistics on this, we decided to maintain Mzimba North as our focus area.

Figure 2. Districts Selected for GCFSI Study in Malawi



two districts selected were Thyolo and Chiradzulu. In Thyolo, the EPA(s) identified were Masabanjati and Khonjeni. In Chiradzulu, we selected Namitambo.

2.2 Conceptual Framework

To analyze the pigeon pea value chain, we use a rapid assessment approach and the Integrating Gender into Agricultural Value Chains (INGIA-VC) analytical framework developed by Rubin et al. (2009). Rapid assessment tools look at the roles of men and women in the value chains, what markets men and women access and what gender-based constraints and opportunities exist, the information gathered is used to give direction on possible interventions for existing problems and/or gaps requiring further research (Matua, et al. 2011). Rapid assessments make use of qualitative and/or quantitative tools.

The INGIA-VC process consists of five phases.[5] As explained by Rubin et al. (2009), Phase one involves a mapping of gender relations and roles along the value chain — (1) mapping men's and women's participation and benefits along the chain and (2) identifying the factors that shape the gender patterns in value chain operations. Phase two involves identifying GBCs. Phase three involves assessing the consequences of the GBCs for the achievement of project outcomes, and on women's economic empowerment. Phase four involves acting to remove GBCs, and Phase five involves measuring success. This research will achieve the first three phases of the INGIA-VC analytical framework, and

[5] See the handbook for a detailed description of the INGIA-VC and the five phases.

then determine the implications of the findings for the scaling of multipurpose legumes in Malawi.

Specifically, quantitative data were collected to map men's and women's participation at various levels in the pigeon pea value chain. In addition, the Gender Dimensions Framework (GDF) was used to collect and organize qualitative data necessary to understand gender relations and roles along the pigeon pea value chain. According to Mayoux and Mackie (2009), qualitative analysis is essential for establishing existing inequalities and their causes, power dynamics at play along the value chain and points of convergence and divergence of interests among actors. The GDF contemplates four dimensions: i) access to and control over key productive assets (tangible and intangible); ii) beliefs and perceptions; iii) practices and participation, and iv) legal frameworks. Power is a crosscutting component in each of these four dimensions (Rubin et al. 2009). The GDF is a rigorous analytical tool because it facilitates data collection, and describes key gender relationships and social interactions, thereby making clear the importance of GBCs or GBOs for development outcomes.

In the GDF, the term 'access to assets' describes the social relationships that shape the allocation of resources that are necessary to be a fully active and productive (socially, economically, and politically) participant in society. These include access to land, labor, capital, natural resources, education, employment, and information (Rubin and Barrett 2009). Empirical evidence supports that household assets are not always pooled. On the contrary, they may be held individually by men, women, and children (Haddad et al. 1997). Men and women own different types of assets, accumulate these assets in different ways, have differential access to the same set of resources, and distribution between men and women is often unequal (Meinzen-Dick et al. 2011; Rubin et al. 2009). Who within a household has access to which resources and for what purposes is conditioned by the broader sociocultural context and by intra-household allocation rules (Meinzen-Dick et al. 2011). Further, the distribution of assets within the household is critical to household and individual well-being, as measured by outcomes such as food security, nutrition, and education. Not only do different types of assets enable different livelihoods, but also, different types of assets may have different implications for bargaining power or well-being within the household (Meinzen-Dick et al. 2011).

The gendered nature of asset distribution has implications for participation at different nodes of the value chain and the control over the benefits derived from participation. Specifically, under the access to assets dimension of the GDF we examine questions such as, "What are the resources needed to participate in this value chain? Do men and women differ in their ability to mobilize those resources? And, if so, how?" The goal is to identify any gender disparities with respect to these resources and their implications for participating at the various levels of the value chain.

The second dimension of the GDF framework, referred to as practices and participation, examines how gender influences what people do, and the way they engage in development activities (Rubin et al. 2009). This dimension examines the questions, "Who does what, or who is involved in what activities? Why?" Specifically, it seeks to understand the productive, reproductive, community

development roles and responsibilities of men and women, and to determine the implications and rewards for value chain participation.

The third dimension, beliefs and perception, covers who knows what and how they know it, describing how these domains of knowledge differ by gender category. What areas of agricultural work and enterprise development are most likely to be learned by boys and men? Are men expected to grow certain crops and not others? Are some crops solely the province of women? Different cultures have belief systems about gender that shape gender identities and behavior, defining what roles are considered appropriate for men and women, boys or girls and how they go about their daily lives (Rubin et al. 2009).

The fourth dimension, which includes laws, policies, and regulations, is based on the fact that gender can influence the way people are regarded by and treated within the judicial system—including customary law and the formal legal code. Gender may affect rights to legal documents, ownership and inheritance, reproductive choice and personal safety, representation, and due process.

2.3 Implementation

Surveys were designed for actors at each node of the pigeon pea value chain, including seed actors, farmers, farmers cooperatives, retailers/local processors, independent traders/buyers, and large-scale export buyers/processors (Table 1). A total of 23 focus group discussions (FGDs) were conducted with men and women pigeon pea farmers in the selected EPAs. In most cases, separate FGDs were held with men or women farmers. Mixed FGDs were conducted in some EPAs to clarify responses obtained in the separate FGDs. The survey designed for pigeon pea farmers was meant to collect data on sources of seeds, cultivation practices, decision making, gender division of roles in production and marketing, resources critical to production and marketing, access to and control over resources, control over revenue from pigeon pea sales, and relationships downstream the value chain. A FGD was also held with representative members of a farmer-owned pigeon pea marketing cooperative in the District of Chiradzulu. Specifically, we asked questions to understand the motivations for forming a marketing cooperative, the organization of the group, leadership and decision making, eligibility for membership in the cooperatives, resources required in the running of the cooperatives, how the resources are accessed, and several others. (See Appendix A for the interview guide used in each stage of the value chain).

With pigeon pea retailers, local processors, buyers, and traders, we collected quantitative data to understand men and women's participation—i.e., the proportion of men and women at these levels of the chain.

Qualitative data were also collected to identify resources that are critical to operate at these levels of the chain, access to the resources for men and women, social and demographic characteristics of the actor's households, activities involved in the operation of the business, who does what and why, sources of the grain legumes, relationships with upstream and downstream actors, motivation for involvement in the value chain, beliefs and perceptions that affect the participation of men and women at specific levels of the chain, and finally any laws and policies that affect the operation of their business.

Table 1. Data Collection

Value Chain Node	Data Collection Mode (n)	Female	Male	Total Respondents
Seed Actors	Key Informant Interviews (6)	unreported	unreported	6
Producers	Focus Group (23)	152	108	260
Producer Cooperative	Focus Group (1)	21	9	30
Retailers and Local Processers	Key Informant Interviews (19)	14	5	19
Local Buyers and Traders	Key Informant Interviews (10)	2	8	10
Export Market Buyers and Traders	Key Informant Interviews (4)	unreported	unreported	4

Figure 3. Producers of Pigeon Peas, Mzimba North District

With large-scale export buyers /processors, qualitative data were collected to understand how they obtain supplies of pigeon peas, existing networks with upstream and downstream actors, and beliefs, perceptions, laws, and policies that affect their operations.

3. FINDINGS AND DISCUSSION

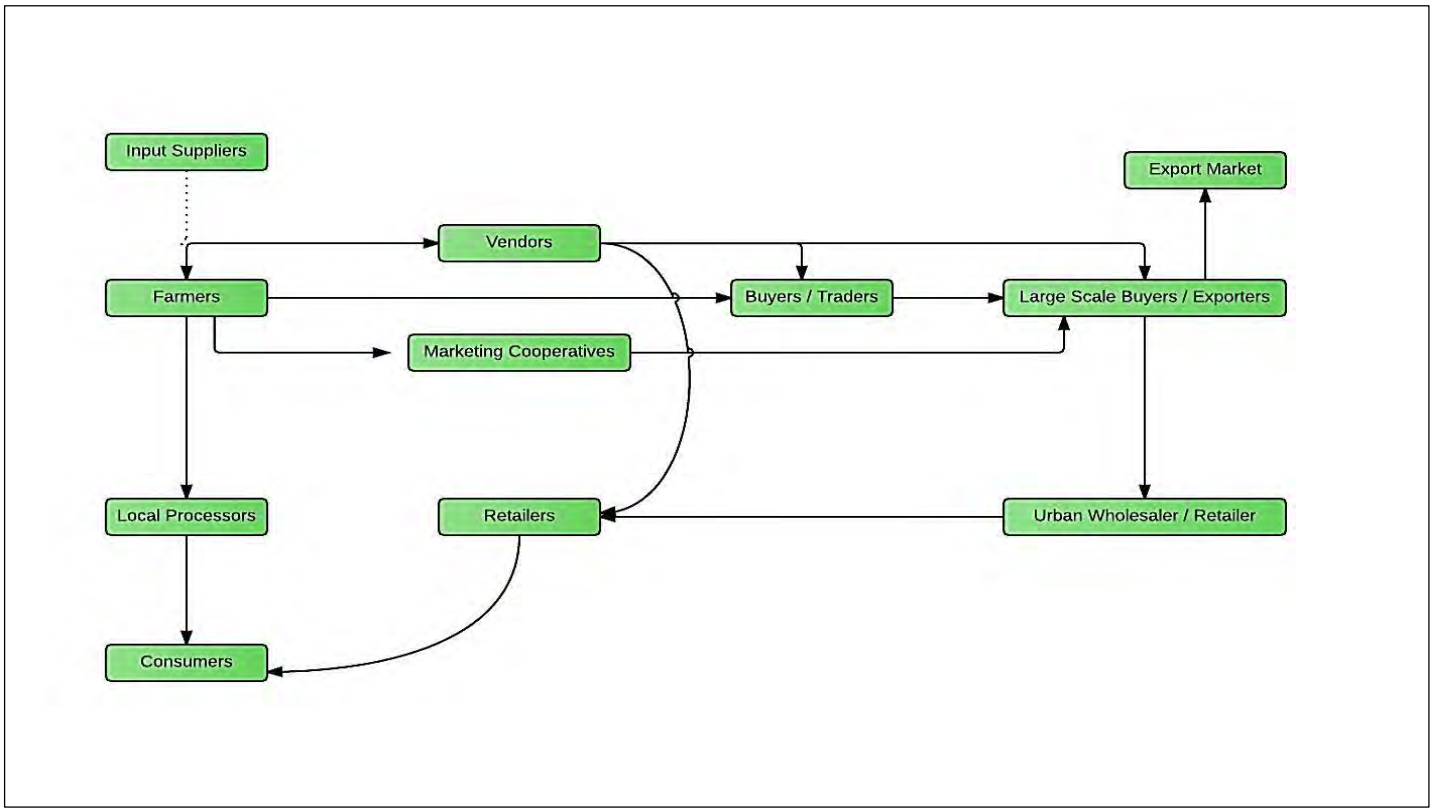
Figure 4 below is a sketch map of the pigeon pea value chain in Malawi. Input suppliers include all actors involved in supplying crop-related inputs to the farmers. A major input in pigeon pea production is seeds. Smallholder farmers cultivate the legume, harvest, dry and sell the legumes to either vendors (middlemen), traders/buyers in the villages (or rural assemblers) or to the branches of large-scale buyers/processors. Some smallholder farmers sell their legumes through marketing cooperatives (if members of cooperatives). Other smallholder farmers are also local processors. During harvesting season, they process (cook) the fresh legume and sell for consumption as a snack food.

Most local processors obtain the pigeon pea that they process (cook) from their own production. The vendors mostly sell dried grains purchased from farmers to traders/buyers or directly to the large-scale export buyers/processors. Traders/buyers buy legumes from farmers, vendors, and farmers' groups and sell to the large-scale buyers/ processors. Large-scale export market buyers export dried as well as processed grains overseas. Retailers purchase processed grains (dried, dehulled and split) from urban wholesalers/retailers or large processors which they sell to consumers in villages or peri-urban areas. Some urban wholesalers also retail, they sell directly to consumers.

3.1 SEED SYSTEM ACTORS

The research team was unable to identify any suppliers/distributors of pigeon pea seeds during fieldwork. The FGDs with

Figure 4: Map of the Pigeon Pea Value Chain in Malawi



farmers revealed that most farmers use recycled dried grains as seeds. We conducted interviews with actors in the seed system to understand challenges in the pigeon pea seed system. Specifically, the team met with representatives from the Field Crops Department at the Ministry of Agriculture; the Association of Smallholder Seed Marketing Action Group (ASSMAG); the Alliance for Green Revolution in Africa (AGRA); the National Smallholder Farmers Association of Malawi (NASFAM); the International Center for Research in Agroforestry (ICRAF); and Center for Agricultural Research and Development (CARD). Table 2 highlights some of the issues in Malawi's pigeon pea seed system.

Discussions with the key informants revealed that the government of Malawi (GOM) has a pigeon pea national program which works in partnership with ICRISAT on pigeon peas and other legumes. Several varieties of pigeon pea have been released under this partnership. Between 2009 and 2013, three medium term varieties (take about six months to mature) were released. Prior to this, the GOM had released two long-duration varieties, and two short-duration varieties (matures in about 120 days or less than four months). The local variety of pigeon pea takes about 8-9 months to mature. These varieties are not without tradeoffs — for instance the short-duration varieties take longer to cook than the medium and long-duration varieties. *Mthawajuni* is another variety of pigeon pea found in Malawi. The source of this variety is unknown, and unlike the other varieties, this variety is very pest resistant. As observed by Dr. Kananji, research to incorporate the pest resistant trait from *Mthawajuni* into the medium term variety released in 2013 is ongoing.

Low excludability of pigeon pea seeds and farmers' frequent use of recycled seeds were identified as major disincentives to local seed production, especially as seed producing companies are profit oriented. It was reported that in spite of the higher seed multiplication ratio[6] (compared to other legumes), farmers lacked the incentives to purchase pigeon pea seeds. This lack of incentives to purchase better quality and high-yielding seeds and the correspondingly low demand for pigeon pea seeds was mostly attributed to low output prices offered to farmers by buyers. Added to low output prices, it was observed that the common practice of *hold ups* whereby export buyers promise to buy legume at a certain price during planting season but default on the price after farmers have harvested the legume, discourage investments in legume seeds. Consequently, when farmers say there is *no market*, in reality what they mean is that the price is not attractive and the activity is not profitable.

The discussions with the representatives of the seed system also reveal potential variation across regions in the incentives to purchase pigeon seeds. Specifically, it was observed that small land parcels in the South region and the practice of intercropping pigeon pea with other crops reduces farmers' incentives to buy certified seeds in this region. In contrast, the incentives to purchase pigeon pea seeds for larger scale pigeon pea production for commercial and household uses are likely to be higher in the North region where land is not a limiting factor. In spite of this advantage in terms of land availability,

[6] Only about 10kg of seeds is required to plant 1 hectare of land as opposed to a legume like common bean which requires about 80kg to plant a hectare.

market access and attractive output prices were identified as key determinants. Producing the seeds would mean nothing if there is no demand for them, and it is the output prices that provide the incentive to buy higher quality seeds.

Furthermore, it was reported that the GOM had previously attempted to engage farmers in community seed production. However, the attempt was not successful because of the challenges associated with bringing farmers to work as a group (collectively), the lack of trust among farmers being a critical factor. The GOM continues in its effort to identify ways of enticing local seed companies to get involved in the production and distribution of legume seeds.

According to the President of ASSMAG, the association has the capacity to produce pigeon pea seeds in large amounts; however, ASSMAG is not currently involved in the multiplication of pigeon pea seeds because the demand is too low and pigeon pea production is not profitable to many farmers. Additionally, in spite of the GOM's effort to set farmgate prices for grains, few farmers have access to price information and monitoring remains a huge issue. He observed that poverty, the lack of an alternative source of income, and lack of grain storage compel farmers to sell at very low prices. The discussions also revealed the existence of an agribusiness component in the Extension unit of the Department of Agriculture whose primary goal is to encourage farmers to form cooperatives and to provide farmers with information on farm gate prices. Unfortunately, the extent to which this unit is working effectively is questionable.

NASFAM is one of the biggest Feed the Future (FTF) partners in Malawi-covering over 100,000 households. Club membership fee is at 300 Malawian Kwacha annually. Within the club farmers grow different commodities, including legumes. For legume crops there are more women members in the in club. NASFAM's involvement in pigeon pea seed multiplication is mostly in the Southern region of Malawi.[7] The problem of livestock damage in the Central region was identified as a factor that discourages NASFAM's involvement in pigeon pea seed multiplication in this region. In the South region, NASFAM supplies pigeon pea and other legume (mostly groundnuts and soybeans) seeds to farmers who are members of NASFAM clubs to support the double-up legume technology. Specifically, basic pigeon pea seeds received from the research station are handed to farmers selected by the NASFAM clubs for multiplication. Selected farmers must sign a Memorandum of Understanding stating that they will not sell the seeds to anyone other than NASFAM. Certified seeds produced from the basic seeds are sold to NASFAM. NASFAM then loans certified seeds to farmers who are members of the NASFAM clubs and desire to grow pigeon peas. Farmers pay back to NASFAM double the amount of certified seeds received upon crop harvest. These seeds are not quality assured seeds because farmers are not supervised in the production of the seeds.

International research organizations play an important role in the distribution of pigeon pea seeds. ICRAF for instance, based on its interest in pigeon pea as a soil fertility management crop distributes small quantities of pigeon pea seeds obtained from ICRISAT free of charge to farmers. According to the representative from ICRAF, not only have past efforts to get farmers to purchase their own seeds been

[7] Balaka, Mangoachi, and Machinga.

unsuccessful, but farmers sometimes eat the seeds given to them due to hunger. This finding reveals that access to seeds is much more complicated for poor vulnerable households. For these households to save seeds for production there must be an alternative source of food for the farmer and their families.

The discussions also identified insects as a major challenge to most varieties of pigeon peas, flowering usually coincides with a period of high insect population. This makes pesticides a key input in pigeon pea production. However, farmers lack knowledge of the different varieties available, the characteristics of each variety and the appropriate plant population and spacing interval. As a result, it is common to find farmers using the wrong pesticides (e.g., maize specific pesticides), applying them in the incorrect period during the growth cycle and other application inefficiencies such as incorrect planting or spacing intervals. The uneven distribution of agro-dealers dealing in pesticides across the nation and farmers' limited financial resources to purchase the pesticides further complicates the problem. This finding reveals a need for farmer education to enhance agronomic practices for intercropping with maize.

Another factor identified, which discourages pigeon pea production, is the long duration characteristics of the local variety of pigeon pea that is mostly grown by farmers—it takes about seven to nine months to mature. The discussions highlighted a need for research to come up with a shorter duration variety that takes approximately the same time as other legumes to mature (about four months). It was argued that a shorter duration variety is particularly important for the Central region, the country's maize hub, where goats are a major threat to maize and pigeon peas. Intercropping maize with long duration pigeon peas requires that goats remained restrained for an additional four to five months after maize has been harvested, which discourages pigeon pea production in the region. According to Dr. Kananji of AGRA, the introduction of the variety *mwaiwathaulimi* (a medium-term) which lasts one month after maize, has encouraged farmers to grow pigeon pea since they do not have to restrain their goats the whole year as was required with the long duration variety. This was argued to have led to increased pigeon pea production in non-traditional pigeon pea producing areas.

Table 2. Challenges in the Pigeon Pea Seed System in Malawi

Type of Constraint	Identification	Implication(s)
General Constraints		
Production	Very low use of improved seeds among smallholder farmers—seed recycling is a common practice. Heavy reliance on research organizations for free, improved seeds, which are then recycled for several years.	Low demand for improved seeds coupled with low excludability discourages investments in seed production. Low use of improved seeds has implications for yields.
	Common variety matures in 8-9 months, considered long compared to maize and other legumes (average 4 months to maturity).	The long-duration characteristic acts as a disincentive for adoption and expansion; and poses a challenge in the Central region where livestock damage is an important threat to the legume. Need for shorter duration and pest-resistant varieties was identified.
Marketing		
	Improved pigeon pea seeds when available are more expensive than other legume seeds. Frequent price fluctuations, low output prices, and limited and varied access to output price information	Affects profitability of pigeon peas and discourages investments in high-yielding seed varieties, especially with low output prices.

Overall, the data collected from these different actors in the pigeon pea seed system in Malawi reveals that access to better seeds remains an important challenge for the expansion of this legume. These findings are summarized in Table 3 above, However, opportunities still exist to expand the production of this legume. In the tobacco growing areas in the Central region for example, it was reported that farmers are looking for alternatives to tobacco since the future of tobacco is not promising (declining prices). However, farmers need to invest in high-yielding seeds to be able to capture that opportunity. Unfortunately, low output prices act as a major disincentive for farmers to invest in high quality seeds, thus hampering their ability to take advantage of the opportunity. Farmers' heavy reliance on research organizations for free seeds (which they recycle several years after) certainly has implications for yields or gains in productivity and total production.
Other general pigeon pea production challenges include: livestock and insect pest damage, lack of price information, and farmers' limited bargaining power. All of these act as disincentives to invest in seeds.

3.2 FARMERS/PRODUCERS

Data collected during the fieldwork supported variations in the level of pigeon

pea production and marketing across the three regions of Malawi. Not surprisingly, farmers in the South region continue to dominate in terms of production and marketing of this legume, given the long tradition of pigeon pea cultivation and consumption. Moreover, the concentration of multinational companies trading in pigeon pea and other grain legumes in the South creates a high demand for pigeon peas in the export market, thus providing an incentive for farmers to expand production. Farmers in the South reported recent increases in the value of the legume as a cash crop. They attribute this change to a period spanning the last five years, where the crop transformed from being solely a staple food source to a source of income to many farm households. The growing demand for the legume was also credited with creating changes in cultivation practices. While farmers reported a mix of cropping methods, they indicated that increasingly field space is being allocated to pigeon peas over other traditional crops.

Compared to the South region, pigeon pea production is relatively new in the Central and North regions of Malawi. For example in the Nsipe EPA (District of Ntcheu, Central region), the farmers in the FGD reported that they had only grown pigeon pea for two seasons, and had lost almost all of the first harvests to pest and disease. The farmers were expecting their second crop when the FGDs were conducted. In both the Central and the Northern regions, farmers characterized pigeon pea as largely a crop for the poor, and one that serves primarily as food. The farmers mentioned that compared to cowpeas, there is very low demand for pigeon peas—very few buyers are present at the farmgate or in the local markets. This low demand for pigeon pea creates a disincentive for farmers to scale-up production of the legume, despite farmers' awareness of potential soil fertility gains associated with growing the legume. Further, consumer demand for the legume in these two regions is mostly from the population of immigrants from the South, and as a result not as high as in the South where pigeon pea cultivation is a daily part of the food culture.

The data revealed that several factors influence the adoption and expansion of pigeon pea across all three regions in the country. Specifically, these include limited access to production resources; and intra-household dynamics and gender relations that influence access to and control over these resources, as well as define roles, responsibilities, and the outcomes from participation in production and marketing activities. Tables 3 and 4, respectively, summarize general and gender specific constraints faced by pigeon pea farmers.

3.2.1 Seed Quantity and Quality

In all three regions, farmers identified access to the desired quantities and quality of pigeon pea seeds as a major barrier to expanding pigeon pea cultivation. Unlike other legume seeds (e.g., groundnuts, soybeans) pigeon pea seeds were not available in the market or in retail shops specializing in the sales of other legume seeds. In the North and Central regions, local NGOs and research organizations play a major role in providing legumes and other seeds to farmers. While the seeds are usually free, farmers have to choose one type of seed from the portfolio of seeds presented to them by the organization. The FGDs in the North revealed that access to seed is a major motivation for joining farmers or producer groups, and that these farmers groups are

organized around local NGOs (e.g., Total Land Care, etc.).

Other sources of seeds identified in the FGDs in North and Central regions include buying from other farmers or receiving seeds as a gift from friends. However, farmers in the North and Central regions indicated a low incentive to invest in seeds because of few pigeon pea buyers in these regions compared to the South. Use of purchased seeds in these regions was limited as farmers are yet to perceive the legume as a potential income generator. Some farmers mentioned that even when they would like to purchase seeds, it was difficult to identify other farmers to buy seeds from, given that most were unable to recycle seed from the first harvest due to pest damage, or that they had to eat all that was produced because of food shortage.

Even in the Southern region where pigeon pea activity is greater, access to seeds was still identified as a major challenge to expansion in production. Most farmers continued to rely on recycled seeds for their production— saving the best pigeon pea grains from previous harvest to use as seeds in the next planting period. However, they observed that the quantity saved is not always sufficient to plant the total area that they would like to cultivate for pigeon peas. Limited seed availability is especially problematic for the poorest of households who are unable to recycle grains for seeds given their immediate consumption needs. Not surprisingly, across all three regions, farmers' perception of household wealth indicators revealed that poor households were those who ate pigeon pea seeds rather than save them for the next year's planting. Compared to the North and Central regions, farmers acknowledged that in addition to receiving seeds from research organizations, they could also purchase dried grains for seeds from other farmers or legume traders in the local markets.

Overall, there appears to be an opportunity to expand production of the legume, particularly in the North region where land is not a limiting factor; however, investments in seeds are not likely if output prices remain unattractive. As Snapp et al. (2002) points out, farmers privileged cash receipts over soil fertility when making cultivation decisions. Thus, improving seed access is a necessary but not a sufficient condition — there must be a profitable market for the legumes for farmers to adopt or expand production beyond household consumption needs.

3.2.2 Labor

Family labor remains the major source of effort in pigeon pea cultivation across all three regions. Data on the division of agricultural roles/labor associated with pigeon pea cultivation reveal that in all three regions, it is the women of the family who provide much of the required labor. Women were more likely to be in charge of seed selection, seed storage, harvesting, transport, and cooking (where pigeon pea was used for household consumption). Women reported that seed planting and winnowing were left to them as the small size of seeds and the intricate nature of winnowing could only be performed by women. For example, women in the Southern region stated that men were careless with the small seeds, not caring how much they threw into each hole. Further, women in the Central and Southern regions indicated a concerted effort to control seed selection and seed storage to ensure that men do not sell these scant resources for alcohol. The late maturation of pigeon peas results in the harvesting of this crop occurring well after

the maize season. Thus, men and women reported that harvesting was left to women, as men were busy with off-farm activities. The scope of the pigeon pea harvest was less than maize, and consequently, possible for women to accomplish on their own.

Activities such as field preparation, weeding, residue incorporation, and pest application were often described as joint or family activities. This finding can be attributed to the common practice of intercropping pigeon pea with maize and other cash crops—preparing a field for these important crops would be performed by the whole family. Some of the farmers mentioned that cash crops get priority in terms of labor and other resource allocations, occasionally resulting in the late planting of pigeon pea or other crops that are of a lower cash value.

In the South region, men are increasingly involving themselves in marketing activities. In the North and Central regions, limited access to markets (and hence the potential to generate income) was frequently cited as a disincentive to men's involvement in pigeon pea production. The existing gender division of labor highlights that efforts to expand legume production are likely to have negative implications for women's labor if the current gender division of labor that leaves most of the work on women is maintained.

3.2.3 Land

Access to land is crucial to pigeon pea adoption and expansion. However, differences were found across regions in farmers' perception of whether or not they had sufficient land to expand production activities. In the Northern region, farmers did not report any concerns related to farm size and crop expansion. Instead, to these farmers, access to seeds and markets were the major challenges associated with pigeon pea adoption and expansion. Contrary to the situation in the Northern region, men and women farmers in the Southern and Central regions expressed concerns about their small farm plot sizes being a deterrent to pigeon pea expansion. They specifically reported intercropping with maize—not as a soil enhancement method—but as a means to maximize use of space.

In addition to the general differences in land availability across regions, there are differences in access to and control over land that exist within households. Total size of land available for cultivation is critical to the expansion of the legume, as is who has access to land within the household, who makes decisions with respect to what is cultivated on the land, and who decides how much of the available land is devoted to a particular crop or what crops receive priority on the farm land. Collectively, the factors that influence these decision-making processes are crucial in determining legume adoption and expansion.

It is important to mention the difference in inheritance patterns across the communities selected for the FGDs with farmers. In the Northern region (district of Mzimba North), land inheritance is through the male line (patrilineal) and a woman leaves her village to join her husband in his village. Conversely, in the Central region (district of Dedza) and in the Southern region it was reported that land inheritance was through the female line (matrilineal); therefore, a man would leave his family to join his wife in her village. Notwithstanding these differences in inheritance patterns, we observed a culture of patriarchy across all the communities we visited, whereby husbands or other male members of the

household wield great decision-making power and authority in most spheres.

In the South, men and women respondents indicated that men (husbands) decide how much of each cash crop (maize, bananas, and pigeon peas) to cultivate based on yearly income needs. In limited instances, respondents stated that there would be family meetings related to cultivation choices that incorporated the consumption needs of the household (the purview of women). However, even in households where these meetings were held, men and women respondents agreed that men held ultimate authority. Given the increased economic importance of pigeon peas in this region, men were especially emphatic in overseeing the inputs and management of this crop. This included varietal selection—men preferred seeds with high yields, whereas women preferred varieties suited to consumption.

Similar to findings in the South, men are the household heads in the Northern and Central regions with full authority over finances and cultivation decisions. While the matrilineal culture improved women's bargaining power within the household, it did not necessarily translate to greater control over the asset or revenue generated from the asset for women. Men/husbands make major decisions with respect to the cultivation and selling of the legume. In the Northern region, for instance, farmers spoke of women being 'bought' through the dowry system. When asked of women's role in household and cultivation decision-making, one respondent stated, "If a man says no, there is nothing a woman can do to compel him to change his mind." Thus, access to, or ownership of assets is a necessary but not a sufficient condition for women's empowerment. Our findings support findings from previous research (Osmani Sen 2003; Hillenbrand 2010) that social norms in Malawi favor men as decision-makers, whereas women are charged with childcare, provisioning, and domestic tasks.

Gender differences also exist in preference for different types of legumes. While men farmers are interested in the marketability of pigeon peas, women are interested in the legume as a food crop (and other reasons such as for fuel.) Intra-household gender relations place upon women the responsibility to prepare food for the family. Women's maintained interest in the legume in these regions in spite of its limited marketability or potential to generate income is tied to their role in the provisioning of food for their homes—they need *relish* for their families to eat with *nsima* (a maize-based staple food). The limited cash generating potential of the legume in the North and Central regions has made the legume secondary to other cash crops, in terms of land, labor and other resource allocations. Most women indicated that the crop is usually planted late after the main cash crop has been planted. Women from the Central and North regions also observed that the lack of financial benefits acts as a disincentive for men to be involved in the production of this legume. However, they noted that if pigeon pea expansion were to occur with better access to markets, and if greater cash sales resulted, then men would appropriate this crop. Presently, as a household consumption resource, women in the North and Central regions make cultivation decisions related to the amount to be planted each year.

Gender power relations, gendered priorities and preferences within the household implies that the decision to adopt or expand legume use within the household must satisfy the needs of the one who has more power and control. As shown, this is

usually the husband or head of household. Not only does the marketability of legumes rank differently for men and women farmers due to differences in roles, but also the data reveals gender differences in market access/participation, in market experiences and in control over revenue/income. Table 4 describes the gender-based constraints and their implications for pigeon pea production and marketing activities.

3.2.4 Marketing

The analysis revealed gender differences in market participation/access across all three regions. In the South, farmers reported that both men and women farmers are involved in the marketing of pigeon pea. Women farmers observed that men's interest in the marketing of this legume has grown over time due to the increasing role of the crop as an income generator. In the North region, access to profitable markets is particularly limited for women farmers. Cultural norms restrict women's mobility, thereby limiting their access to profitable markets. In the North, men and women agreed that the markets were simply too far for women to travel to, given their household duties and security issues. In this region, their income activity is restricted to what products may be sold at the farmgate.

In addition to distance and cultural restrictions on women's mobility, gender differences in access to transportation also had implications for women's participation in markets. Women farmers in the Southern region frequently reported that they are responsible for transportation of dry pigeon pea grain to the markets for sale. These women indicated that they transported pigeon pea grain by headload to the markets, a process that is physically demanding and time consuming. Women farmers reported that they would like assistance from their husbands who own bicycles that could be used to transport larger quantities to the markets or point of sale. However, they observed that involving their husbands in the transportation and marketing of pigeon peas quite often would result in their husbands using the revenue generated from sales to buy alcohol and/or hire prostitutes, rather than spending the money on important household needs like food. They stated that the money is *wasted*. According to the women, this practice was a major source of household conflict, and could result in their family going without food or being forced to find alternative food provisioning resources.

Table 3. General Constraints in Pigeon Pea Production and Marketing

Area	Identification	Implication(s)
Production	– Seeds are not available in the quantity or quality needed by farmers; practice of grain recycling for seed is not able to satisfy actual seed needs.	– Farmers are not able to expand production in regions where demand is high (e.g., South) or in the North region where land is not a limiting factor.
	– Lack of cash resources limits farmers' investments in pigeon pea specific inputs. For example, pesticides are often appropriate for maize only.	– Pigeon pea yields are reduced because of pest exposure; farmers less likely to see profit, thus discouraging adoption/expansion.
	– Livestock (goats) is an important challenge in production. Problem is further complicated by the long duration characteristic of the commonly grown pigeon pea variety (8-9 months).	– This discourages expansion; long duration nature implies farmers need to restrain goats for longer duration. Production of short-duration varieties is likely to encourage adoption and expansion.
	– Access to land for cultivation is limited in the Central and Southern regions of the country. Farmers grow very small parcels of land.	– Expansion can only take place by expanding access to land or by providing training to farmers on best farm agronomic practices as well as the nutrition benefits of intercropping maize with legumes.
	– Limited access to agricultural extension services (few extension workers in all regions); workers also lack resources and capacity to support farmers effectively.	– Negatively affects farm productivity and hence the profitability of pigeon pea production.
	– Farmers lack knowledge of best agronomic/farm management practices to maximize legumes and main crop yields; appropriate fertilizer and pesticides, and seed varieties.	– Affects pigeon pea yields. Given competition with other crops for limited resources and the important role of maize as a food security crop, promoting adoption or expansion of legumes must incorporate capacity building for farmers on best farm management practices, pesticide application, etc.
Marketing		
	– Access to markets (North and Central regions)—Poor transport infrastructure; buyers do not come to the location of farmers.	– Limited income-generating potential for the legume discourages expansion and adoption. Increasing production beyond household consumption needs would require access to markets.
	– Lack of access to reliable output price information, plus frequent fluctuations in prices, coupled with perceptions of being cheated by vendors.	– The practice of selling small quantities individually also reduces farmers' bargaining power and makes them vulnerable to cheating by vendors, thereby discouraging investments in the legumes.

Farmers in the Central region echoed the same concern about involving their husbands in legume marketing and how their husbands would use the revenue from sales for their individual wants (alcohol), rather than for the common good of the household. This practice was common to pigeon pea and to other legumes, such as cowpeas and groundnut. The use of sales revenue by men for alcohol was not mentioned in the focus groups in the Northern region. However, men and women farmers in the Northern region reported that there are security concerns for women traveling long distances to markets for any type of crops. As a result, men were most likely to transport crops to the market for sale in this region. Further, as earlier stated, pigeon pea activity in the North and Central region was low because of limited markets/buyers; as a result, very few men/husbands had any interest in this legume. The responsibility for this crop was left to the women in their communities. Notwithstanding, there was agreement that men would take interest in pigeon pea marketing activities, including training on new technologies, if it were possible to sell this crop for income.

Overall, our findings support earlier research that found that women in Malawi do not have access to transportation, nor are they able to travel the several days required for market sales given their childcare responsibilities (Bezner-Kerr et al. 2013). Thus, if pigeon pea intensification is going to benefit women farmers and their families, women's access to markets and transportation must be addressed.

Women's limited access to markets also affected the prices they received for their commodities and their overall experience in marketing. Across FGDs in the South region, the general challenges to marketing include the perceived low prices offered for pigeon peas and the unfair practices of vendors. Both were reported as disincentives to growing pigeon peas. Women in the South reported a practice of weighing their grain with more than one vendor before selling. However, they observed that men did not have the patience to do so and would often sell to the closest and most convenient vendor rather than locate the best price.

In the South and Central regions, it was reported that vendors offer lower prices to women than men farmers because they are aware that women cannot travel far away from their homes to find better prices. Mobility restrictions also affect women's negotiation/bargaining skills. Women are more likely to accept lower prices from export buyers because the cost to them of staying one more day to search for better prices is too high. There was consensus among respondents in the North that in instances where women may have travelled to markets in the past, the combination of gender discrimination by vendors and gender disparity in negotiation skills of women smallholders resulted in low prices and fraudulent weights. The opportunity for women in the Central region of Malawi to participate in markets is not restricted by distance, but by buyer/vendor demand and modes of transport (headload v. bicycle). Throughout all three regions, women reported difficulties in relationships with buyers at markets that were not reported by men. This finding is important given the recent research by Makoka (2009) indicates that at regional commercial centers, and when interacting with intermediate buyers, smallholders were often victim to usurious lending schemes or faulty scales. Makoka (2009) did not specifically isolate for the differential experiences of women and men.

Table 4. Gender-Based Constraints in Pigeon Pea Production and Marketing

Area	Identification	Implication(s)
Production	– Unequal gender division of labor within the household and the notion that legumes are a women's crop (North and Central regions) leaves women providing most of the labor for pigeon pea and other crop production (e.g., maize), as well as for domestic chores.	– Expansion in production is likely to intensify women's workload if the existing gender division of labor remains unaltered. The allocation of labor and other resources gives priority to more profitable crops, sometimes resulting in neglect of pigeon peas and late planting.
	– Pesticide application is a challenge for women farmers since the spraying equipment is usually large and difficult for women to operate. Women have to rely on their husbands or adult men for this activity. For widows, and unmarried women, lack of resources limit their ability to hire labor for this activity.	– Inability to use or hire labor for pesticide application increases the risk of damage to the legume by insects or pests.
	– Cultural norms designate men as household heads, making them in charge of major farm investment decisions such as what to cultivate, where and how to cultivate, investments in inputs and in the allocation of productive assets.	– Efforts to promote legumes must identify ways of improving decision making within the household to stimulate or provide incentives for investment in legumes.
Marketing	– Cultural limitations on women's mobility, domestic responsibilities, and lack of access to mechanized transportation (e.g., bicycles and carts) hinder travel to locations where the legume can be sold. Lack of resources limits ability to hire transport.	– Women farmers are forced to sell locally (small quantities mainly transported by headloads) or at the farmgate, fetching lower prices for their grain. This reduces the profitability of production and discourages expansion. Even when they sell through their husbands, the income generated from sales hardly reaches them.
	– Women farmers often face gender-based discrimination in the markets, wherein retailers attempt to undervalue their crop. Vendors know they cannot travel to larger regional markets where prices are higher due to cultural restrictions on their mobility and housework.	– Women farmers must give their grain to their husbands to sell, or risk receiving lower prices. Many women farmers in the Central and South regions will do the latter, because they fear their husbands will spend the income on alcohol and prostitutes.
	– Cultural norms dictate the man as the household head, giving him control over spending and investment decisions.	– Women farmers do not control the income earned from pigeon pea sales. Husbands may choose to divert this income away from future pigeon pea crops or household food security needs.

Therefore, our work helps to reveal specific gender based constraints for women related to pigeon pea intensification efforts in Malawi.

3.2.5 Control over Income/Revenue

Control over the amount of crops sold, the reserve to be kept for household consumption, and finally how to use the cash resources to meet the needs of the family, is also gendered. Without exception, decisions related to the division of cash realized from crop sales, and how these resources were to be used, fell under the authority of men (husbands). This includes monies earned through crops and product sales that were solely gained through the labor of women. Gender power relations influence how crop income is shared or invested on the farm and within the household.

Many women farmers reported that income from sales was partitioned in the ratio 60:40 percent between the wife and her husband. Generally, the provisioning of the household (clothes, food, and soap) was to be achieved through the funds allocated to women by their husbands. The reason for the men receiving a greater share was that men use their cash resources to purchase important agricultural inputs, such as fertilizer. However, it was observed that the farm investments are usually made towards cash crops produced by the household, and usually controlled by the head of household. For example, revenue generated from pigeon pea sales are often used to purchase fertilizer or pesticides for the maize crop, or to purchase other generalized agricultural implements.

Within the farmer FGDs, there were no reports of using pigeon pea revenue explicitly for the benefit of the following year's legume crop—i.e., in the purchase of seeds or appropriate pesticide for the legume. Further, it is customary for women/wives to return all generated revenue to men/husbands, who will then disperse the funds across the household's needs. Women are typically given a smaller percentage of the revenue (regardless of how much was earned from the sale of her crops) to use for provisioning food. This limits the ability of women to purchase inputs that could improve pigeon pea yields; she must first satisfy the food, clothing, and educational needs of her family. Throughout the three regions, it was reported that men also had greater flexibility in using cash for leisure activities/goods. The analysis reveals a tendency by men to spend revenue from pigeon pea on their own personal wants that do not necessarily reflect the needs of all household members.

The co-optation of women's labor, their lack of control over cash resources, and exclusion from resource decision-making all evince continuing unequal gender relations in Malawi. Bezner-Kerr (2005) found that intra-household dynamics vary greatly by region in Malawi, with some families practicing more egalitarian income sharing. Generally, women in the North had less access to cash resources and/or control over household provisioning Bezner-Kerr (2005). While we found some instances of income sharing, the role of men as the authoritative household head was undisputed in our findings. Men's control over resources and decision-making (even when funds are gained solely through women's work) has implications beyond the immediate concerns of seed access and land availability. It has great implications for food security and poverty reduction within the household—especially in the Central and South regions where women respondents reported the use of pigeon pea

funds for alcohol and/or prostitutes. Given the primacy of food provisioning to women's daily lives (Snapp et al. 2002), this tendency can discourage women's participation in the market. Further, gender inequality has been shown to impact the success of nutrition enrichment programs throughout Sub-Saharan Africa (Bezner-Kerr 2005). Given the potential for pigeon peas to address food security concerns in Malawi, recommendations for increasing pigeon pea cultivation in this region will need to address unequal gender relations.

3.2.6 Pest, Disease, and Livestock Damage

In all three regions, farmers mentioned pest and disease damage as a challenge in pigeon pea cultivation. However, as observed by the farmers, limited access to cash makes it difficult to buy the appropriate type and sufficient amount of pesticides. Most farmers relied on pesticides manufactured for maize—the primary cash crop for most smallholders—as there are not sufficient cash resources to buy applications for both commodities. Women farmers were particularly concerned about the problem of pest and disease damage to their crops. Women farmers also reported that their lack of control over cash income limits their ability to purchase pesticides. In cases where access to pesticides was possible, women farmers indicated physical difficulty operating sprayer equipment. Instead, these women reported that men (husbands) were responsible for this activity. Men and women respondents in the Dedza district reported that the chief's harvests were greatest because of his household's ability to purchase pesticide inputs and equipment.

All farmers indicated concerns about damages to the pigeon pea plant caused by livestock in the Central region. Pigeon peas were primarily planted as an intercrop with maize and other legumes. Unlike groundnuts, pigeon peas were a source of food for goats. Growing current pigeon pea cultivars require that the farmers keep their goats restrained for months after maize and other short duration legumes have been harvested. Farmers indicated that this sometimes acts as a disincentive for growing the legume. This finding supports the need for a short duration variety identified earlier.

3.2.7 Knowledge about Pigeon Pea, Participation in Training, and Market Information

Overall, farmers in the North and South reported little knowledge of different pigeon pea hybrids and their performance, as well as farming techniques. The lack of knowledge of new farming techniques was attributed to the difficulty in accessing the agricultural extension agent in the area. Lack of knowledge of different pigeon pea hybrids and their performance was also attributed to the practice of local NGOs who distribute seed packets without accompanying information on variety. In spite of this generality, it was widely acknowledged that women had the most pigeon pea knowledge given their responsibility for the crop from seed selection, to post-harvest. Further, it was also agreed that women would be more likely to participate in agricultural training on pigeon pea production, as men would be more likely to be away from home engaged in other forms of labor. However, we observed differences in men's likelihood to attend training across regions. In the South, men indicated interest in joining farmer's club where they could learn new technologies related to pigeon pea cultivation. In the Central and North regions, where pigeon pea holds little economic value, men indicated that

participation in agricultural training would be a waste of time.

The finding that women farmers' have greater knowledge about the legume, and the important role they play in activities such as seed selection and storage, coupled with the finding that women perform most of the activity associated with pigeon pea production signals an opportunity to promote women's participation in the production of pigeon pea seeds. Such an intervention would give women direct access to and control over income, thereby empowering them to improve the food security and nutrition outcomes of their households. Further, as discussed previously, the restrictions on women's mobility and the risk of men appropriating the crop if access to profitable markets were improved, makes involving women in local seed production an attractive option for women farmers.

3.3 PIGEON PEA MARKETING COOPERATIVE

Generally, group activity was observed to be very low in Malawi compared to other countries in Sub-Saharan Africa. In particular, in the North and Central regions, it was hard to identify any type of group activity around pigeon pea. In the South region, the research team identified a farmer-owned marketing cooperative that was organized around pigeon pea. The cooperative is called Nguludi Pigeon Peas/ Maize Cooperative[8] and had existed only for about seven months at the time of the fieldwork. Membership in the cooperative is closed and annual membership fee is at 500MK. Members are required to buy shares (a share costs 500MK) which serves as capital for the cooperative. Members also pay other mandatory fees. Cooperative funds are kept in the bank and released only with appropriate signature from leadership.

The basic structure of the co-op includes five different subcommittees: marketing, research loans, audit, and discipline; and five leadership positions, including a secretary. Women hold three out of the five leadership positions. The requirements to assume a leadership position include: a strong work ethic, regular meeting attendance (meetings take place once a week for one and a half hours), respect for the rules of the cooperative, and work with others in an egalitarian manner. Current membership of the co-op (nine men and twenty-one women) confirmed findings from the FGDs with farmers in the other regions that women were more likely than men to join farmers' group not just to learn new techniques, but also to gain access to seed and marketing opportunities.

The primary purpose of the co-op is to scale up pigeon pea marketing activities. As noted during the FGDs with producers, seed scarcity is a major factor limiting production. As a result, a major incentive for membership in the cooperative is gaining access to seeds. Other membership benefits include marketing of their pigeon peas directly to large-scale buyers or exporters (under some type of informal contract demand), access to better prices (since vendors cheat them when they sell small quantities individually), and access to loans from the co-op funds. However, during the FGDs, co-op members revealed that seeds are sometimes shared even with non-members with the hope that they would be encouraged to join the co-op, thereby increasing the volume of the legume available to satisfy the demand of the buyers (mostly export market buyers). According to the respondents, buyers from Blantyre

[8] Primary focus is on pigeon peas.

usually demand that they supply a certain quantity for a predetermined price. When the co-op cannot put together the amount required from within, it means they have to buy from non-members to meet the volume. They note further that it is easier to find a market or a buyer when the volume to sell is large. To ensure that they get the best price for their grains, the cooperative engages in a price and buyer search. At the time of this interview, these members had not yet completed a sale, as there was not sufficient harvest in the previous season (and the current season had not been completed).

Furthermore, the respondents reveal that membership in the co-op was particularly beneficial to women producers who unlike men are not *too mobile*. Whereas men travel to town for paid work and market opportunities, women are restricted in their time and physical distance from home. As one woman respondent commented, "Being in [a] cooperative allows us to easily mobilize and to do work even in the absence of men." It was observed that "unlike in the past when men were dominant on everything and women relied on them for everything, nowadays things have changed and women can easily work as men." The respondents also alluded that women wielding leadership positions in the cooperative did not appear to generate any family conflict. The women revealed that attending the meeting was not a problem because they informed their spouses that they were taking responsibilities at the cooperatives and additionally, they plan their activities accordingly. Women members with children are also able to arrange for alternative care for their kids while they attend the meetings.

3.4 RETAILERS AND LOCAL PROCESSORS

A total of nineteen key informant interviews were conducted with retailers and local processors of pigeon peas in the Central and Southern regions of Malawi. Specifically, in the Central region the team visited the Dedza Central market, and in the South, the Namitambo, Yasini, and Kanje markets. Key informants were identified during market visits. This sample included fourteen women and five men. The majority of the respondents were between the ages of 25-50 (n=15) and married (n=15). Two women reported that they were divorced or separated from their husbands; all the men interviewed were currently married. Most respondents had completed primary school (n=13), with four respondents completing secondary school, one respondent with no formal schooling, and one whom had received a post-secondary diploma. The average family had three children under the age of eighteen within the household; only four respondents (three women, one man) had adults other than their spouse living in the home.

3.4.1 Motivation, Participation, and Business Ownership

Our data did not reveal any significant differences between men and women retailers in terms of motivation for involvement in the business. In most cases, where there was another source of income for the family, both men and women retailers pointed to the need to provide food, clothing, housing and education for their families—income from pigeon pea was a contribution to these different expenditure categories. However in about a fifth of the cases (all women retailers), the income from the pigeon pea business was the sole source

of livelihood for their households. These women were FHH, and their husbands were either absent or unable to provide for their households. One of the women respondents indicated that the revenue generated from the business was explicitly used to send her daughters to school, as her husband did not approve of education for girls.

Gender differences were found in participation at this node in the pigeon pea value chain. Respondents reported that women were the majority of retailers/local processors of pigeon pea. It is important here to make the distinction between retailers and local processors. Retailers were mostly individuals that sold dried or processed grains (dehulled and split) to consumers. Most of the retailers mentioned, in addition to selling of pigeon pea, their involvement in the selling of other legumes such as groundnuts, common beans, soybeans, and cowpeas, depending on their seasonal availability. Local processors describe those involved in the selling of cooked fresh pigeon peas pods. Not only were all local processors in our sample women, but the respondents also revealed that local processing was mostly done by women. This was not surprising given that local processing essentially involved cooking, a role that is culturally prescribed to women; and because of the minimal resource requirements associated with the activity. Fresh grain legumes from their own production are boiled and taken to the market to sell to consumers as snacks. Local processing of legumes was very common during the harvest season. Most women do not have permanent spots in the market given the seasonal demand for cooked pigeon pea. In contrast, men and women who retailed dried grain had permanent spots in the market. Women also dominate the retailing of fresh unprocessed pigeon pea pods. The few men interviewed were involved in the retailing of dried, dehulled, and split grains. In contrast to local processing, this activity requires more capital/resources, and potentially higher profit margins. A description of the gender-based constraints found in this node of the value chain is included in Table 6, below.

Thirteen of the fourteen women retailers interviewed reported that they owned the business while their husbands were employed elsewhere or involved in another business. All fourteen women indicated that they were the primary decision makers for their businesses, being responsible for deciding what varieties to stock, the price at which to sell, as well as for seeking price and other market-related information concerning the business. However, these women frequently reported joint decision making with their husbands or other adult men in their households on the use of revenue generated from the business. This was attributed to the position of men as the head of the households as prescribed by their customs. For women retailers, ownership of the business did not necessarily translate to greater decision-making power or greater control over income/proceeds from the business. Most men retailers reported they made joint decisions with their wives with respect to the operation of their businesses. However, further probing revealed that, their wives' involvement in the business was mostly as a source of labor and not as a decision maker. This finding implies that interventions to promote entrepreneurship for women must take into account intra-household dynamics and gender relations that have implications for the success of their businesses.

Table 5. Constraints in Pigeon Pea Retailing and Local Processing

Type of Constraint	Identification	Implication(s)
General Constraints	Difficulty accessing formal capital to start a business. Most retailers and local processors work a second job, or rely on a spouse for startup or operational capital.	This limits the size, performance, and profitability of their businesses. Efforts to support retailing and promote participation at this stage of the value chain should consider micro-lending schemes.
	Few opportunities for business-related training; expensive fees when they exist.	Retailers and local processors are placed at a competitive disadvantage compared to large-scale operators.
	Lack of access to reliable output price information, plus frequent price fluctuations.	Retailers and local processors who lack sufficient storage facilities may be forced to sell with incomplete information, reducing profits and discouraging participation and expansion.
Gender-Based Constraints	Access to cash resources is particularly limited for women who have fewer income-generating opportunities than men — different networks than men and most paid labor opportunities are physically demanding.	Limits the size of their inventory, their ability to bulk buy for discounts. They often buy on credit; quite often, they cannot even breakeven and find themselves in revolving debt to their creditors.
	Cultural norms dictate that women are primarily responsible for domestic tasks.	Women retailers and local processors must limit their hours of operation in order to still meet household labor demands. This reduces their profit opportunities.
	Cultural expectations of women's domestic responsibilities restricts travel to regional markets where supplies are cheaper (i.e., too much time away from home).	This limits the scope, size, and profitability of their businesses.
	Processed grain must be loaded and transported to commercial centers for trade.	These physical activities are often hired out by women retailers and local processors; an expense not incurred by their male peers.
	Cultural norms favor men as the household heads, giving them control over finances.	Women retailers and local processors do not have complete control over the revenue generated through their businesses. Married women in this group may be prevented from investing in their operations, placing them at a disadvantage.

3.4.2 Access to Credit/Finance

Retailers and processors were relatively uniform in describing the resources needed to start and maintain their business operations. Capital was identified as a major requirement for starting up the business as well as for offsetting profit losses due to market fluctuations in prices and demand. Both men and women expressed difficulties accessing personal credit/loans from the banks, which they attribute to very high interest rates. However, the findings reveal gender disparities with respect to access to income-generating opportunities. Common sources of finance for men were farming, other businesses, and wage labor. Unlike men, women retailers indicated they were less likely to work as wage laborers to generate additional capital for their business, either because most of the jobs requiring wage laborers are considered *too physically* demanding and therefore difficult for women to undertake, or they simply do

not have enough time to commit to their household duties, the business, and other work. Moreover, working as a wage laborer sometimes requires travelling far away from their homes, which is difficult for them to do given their household responsibilities. Most married women were more likely to report borrowing capital from their husbands to start-up the business, also when additional capital is required to sustain the business.

Notwithstanding, women were more likely than men to be involved in group/cooperative loan agreements. A woman reported forming a group of eleven members (one man and ten women) to obtain a loan from FINCA (a cooperative bank). Specifically, this cooperative lending scheme required that each member makes an initial investment to serve as collateral against the total loan amount and pays monthly installments to pay off the loan in six to ten months. Members guarantee payment when a member cannot afford to make a payment. A group member who missed an installment was given a specific period of time to reimburse the membership, otherwise they would lose their assets. These gender disparities in access to income-generating opportunities are likely the result of the unequal division of labor between genders within the household which places most of the responsibility for housework on women, thus limiting time available for women to participate in other income generating opportunities. Further, cultural beliefs restrict women's mobility, thereby limiting wage labor away from the home, as well the types of jobs available to them.

Gender disparities in access to income-generating opportunities have implications for the size of the business as well as for investment in other resources that are essential for the business. For instance, unlike most men buyers/traders who owned warehouses/storage units separate from their homes, the woman trader used the same house her family lived in for storage. Poor storage conditions have implications for the quality of the grain and the price received. Furthermore, unlike most men, women do not own a means of transportation; rather they rely on public transport to take their grains to buyers. Supporting women's participation as buyers/traders would require improving their access to credit so they can invest in the infrastructure necessary for the success of their business, or in business related training.

Further, for retailers in particular, money is needed to purchase the dehulled and split pigeon pea to sell to consumers. In the absence of capital, they get the grain from suppliers on credit and have a hard time paying their debt. Processed pigeon pea (dehulled and split), often obtained from the urban wholesalers/retailers in Blantyre, was more expensive than the dried whole grain or fresh grain, but took a shorter time to cook. It also earned a higher premium in the market. The cost of processed grain is a major cost in the retailer's budget. Access to cheaper and small-scale pigeon pea processing facilities can help reduce this cost to the retailer, thereby improving profitability of their business. However, it was not clear during the interviews if there were any opportunities for local and small-scale processing of the legumes. The respondents revealed that processed grains were sourced from the city (Limbe/ Blantyre), and it was not clear if this processing was done by the same export buyers/processors or other processors. Added to the cost of processed grain is the cost of transporting the grain from Limbe/Blantyre to markets in the rural areas. Even when the retailers did not directly obtain their inventory from Limbe/Blantyre, the final price that they paid for the grain reflected the transport cost. Moving the bags locally also requires additional cost, which is likely to be

different between men and women retailers, reasons being that men were more likely to own bicycles or hire vehicles to transport their grains.

Promoting local and small-scale processing of the legume can help reduce costs of obtaining as well as transporting the legume, thereby having implications for the profitability of the business. Local processing of the legume would also free up some of the time women retailers spend travelling to the city to obtain the grain, and this time could be devoted to other profitable activities. As shown by Phiri et al. (1999), the sale price of pigeon peas on the retail market is three times that received at the farmgate. Involving farmers in local processing can help fetch higher prices for the legume compared to what they get from selling the unprocessed dried grain. Discussions with retailers revealed consumers' preference for processed grains because it took a shorter time to cook. According to Nimal-Jayantha and Saxena (1998) with support from the Asian Development Bank ICRISAT scientists worked with Sri Lankan counterparts to design and manufacture a small, portable, medium volume (40kg per hour) dehulling mill and the technology was expected to be transferred to partners in southern and eastern Africa. It will be interesting to investigate how far this intervention went, if Malawi was a beneficiary, and if challenges were encountered in scaling out the technology.

3.4.3 Labor/Time

Labor was identified as another important resource required in retailing or local processing of pigeon peas. The family was the most common source of labor, with approximately 85 percent of respondents (n=16) reporting assistance from family during the busy season. The use of hired labor was more common among men retailers than women. Most women reported that they were unable to hire labor due to the small size of their businesses. It was common for men and women retailers to hire male laborers to assist in transportation of grains, which includes lifting heavy bags of dried legumes upon the heads (a physically demanding activity). Men and women retailers indicated that the activities of buying and grading were their principal responsibilities, as these tasks could not be trusted to hired laborers. One woman indicated that hired laborers were likely to cheat her. The only activity that appeared exclusive to women retailers was winnowing pigeon peas.

Unequal gender division of labor within the household, and the cultural expectation that women take care of children and household chores (such as cooking) also limit the time/labor women commit to their businesses. Women retailers reported having to close their businesses a couple of times during the day or close early in the absence of help, to carry out culturally prescribed domestic responsibilities such as cleaning, childcare, and cooking. Some of the women retailers relied on labor supplied by their neighbors or other women in their households (for example, their mothers) to take care of their households. Most women had their businesses within the home or close to their homes in order to combine their roles as business managers and household managers. In contrast, men pigeon pea retailers reported that the business was their primary focus, and because they could rely on their wives to handle domestic chores they did not have to limit store hours because of household responsibilities. The common practice among women retailers of closing their shops during the day to prepare food for their husbands; and among women buyers/traders of waiting for farmers to come and sell their supplies to them or not being able to travel to heavy legume production areas as their male counterparts,

most likely has implications for the profitability of their businesses. Limited access to finance also impedes their ability to use hired labor.

3.4.4 Market Information

Price and other market information were identified as important resources in the running of pigeon pea retailing and local processing business. Similar to complaints of pigeon pea farmers, retailers and local processors reported variable market demands and spurious interactions with vendors as profit constraints. To counteract this, the majority of respondents mentioned that they attempt to gain information related to market trends and pricing through multiple sources. These include physical market surveys, radio bulletins, and retailer social networks. Several respondents mentioned using market information in combination with other input costs to determine pricing of dry pigeon pea grain; retailers who sold fresh pea pigeon pods would set prices at the beginning of each market day. There were no differences between male and female respondents regarding information sourcing; both men and women respondents indicated that they accessed information through radios, phones and other retailers. Women respondents also mentioned their friends as an important source of information. However, it remained unclear if there were any differences in the extent of use of these different information channels by men and women retailers.

3.4.5 Business-Related Training

Respondents also mentioned the need for business related training. Only four respondents reported that they had received retailing or business management training. Some women respondents received training through the Magomero Training Center, as part of a local non-governmental organization's effort to increase women's economic empowerment. A man who retailed pigeon pea reported that he obtained business management training as part of a loan agreement with the district council. Respondents who did not receive training cited two primary reasons; they did not have financial resources to pay for training, or they felt it better to learn from their personal experiences in the market.

3.5 BUYERS AND TRADERS

Buyers and traders are individuals who buy dry pigeon pea grain from farmers and vendors/middlemen to sell to the large export buyers or processors located in the Blantyre or Limbe. As expected, all of the buyers/traders interviewed were located in the South region (Thyolo and Chiradzulu), due to high pigeon pea activity in this region.

Figure 5. Woman Retailing Legumes in Malawi. Source: GCFSI graduate assistant Danielle Aminarh

Most of the traders/buyers have relationships with vendors/middlemen in high pigeon pea production locations. They arrange with vendors to supply a specified quantity of the legume at a guaranteed price per bag. Among the 10 buyers/traders interviewed, eight were men and two were women. Table 7, below, includes

descriptions of our findings related to the barriers women face at this node of the value chain.

The respondents revealed that all the vendors they bought grains from were men, while the majority of the farmers they bought grains from were women. The vendors usually supply larger quantities than farmers do. Among the farmers, men farmers also sold larger quantities to them than women farmers. Some of the reasons advanced for the smaller quantities brought in by women were their inability to transport larger quantities by head load, and their fear of not having enough to feed their families if they sold all their grain stocks in one transaction. Women farmers however, were mentioned to sell more frequently than men farmers. This practice of releasing smaller quantities for sale from time to time reflects a diversification of the risk of food insecurity by women farmers and this is tied to their role in provisioning food for their families/households.

The respondents also observed quality differences in the grain that was brought for sale by men (vendors and farmers) compared with those brought for sale by women farmers. Women farmers tend to bring better quality (well sorted, free of stones/metals and grass) than men. The respondents explained that this was because women sort and winnow the grain prior to selling, activities considered inappropriate for men because it requires sitting down and using patience to complete a tedious task that is not physically demanding. Some traders also observed that unlike women, men were more likely to sell grain without their wives' consent, and this required that they sneak the grain out before it is sorted and winnowed.

All respondents revealed that they traded in other legumes (in addition to pigeon peas), depending on local availability, seasonality and demand. Buyers/traders also undertake some value addition activities, including storage, sorting, winnowing, and bagging of grains. Some buyers/traders (especially those dealing with larger volumes of the legume) also played the role of seed suppliers to farmers. They supplied good quality pigeon pea grains selected from grains purchased from farmers or vendors. Most of the traders were also pigeon pea farmers.

3.5.1 Participation and Business Ownership

As revealed by the respondents, men dominate this stage of the value chain. At least ninety percent of actors at this node were estimated to be men. All the men interviewed reported owning their businesses. The two women respondents indicated that they jointly owned the business with their spouses. However, one of them explained, "I am the one who is more involved in the management of the business because my husband has a job as an electrician." Gender differentials with respect to access to capital were identified as a major reason for the difference in the level of men and women's participation at this level of the value chain. A male trader explained that: "Men usually have more business capital which is essential in this business. Women are not brave enough to withstand the pressure that the business exerts (particularly demands for mobility in transporting and selling produce)."

Table 6. Challenges in Pigeon Pea Buying and Trading

Type of Constraint	Identification	Implication(s)
General Constraint	Lack of reliable price information and frequently fluctuating prices.	Buyers and traders who lack sufficient storage facilities may be forced to sell with incomplete information, reducing profits.
Gender-Based Constraints	Women face greater difficulty in accessing formal or informal capital at this node; and are limited in their opportunities to generate income through other work given their domestic responsibilities.	Efforts to increase their representation at this level must consider improving their access to business capital.
	Women have limited access to mechanized transportation.	Women buyers and traders must hire out this function, an additional expense that decreases profits, thereby discouraging expansion.
	Cultural ideologies place women at a greater risk for theft and vandalism.	This limits their mobility to locations where they can obtain larger volumes of supply at lower cost, thereby reducing the profitability of their business.
	Women's poor negotiation skills (linked to their need to do business as quickly as possible to return to their families) put them at a risk of selling at lower prices. Their situation is further complicated because they lack good storage (they store seed within their homes instead of warehouses like men).	Their inability to garner good prices from large-scale buyers reduces the overall profitability of their business.

3.5.2 Access to Capital/Finance

Both men and women traders reported difficulty accessing formal credit for their businesses. However, the data revealed some differences between men and women with respect to access to capital/finance from other sources. The discussions did not explicitly reveal that the differences in men and women's access to capital were as a result of any existing gender disparities in resources (e.g., land or other assets required as collateral). However, men's easier access to other sources of capital could be explained by lesser constraints on their time and their ability to be involved in income-

generating opportunities outside of their homes (quite often more rewarding than perhaps small businesses within or close to the home), greater control over income within the household, as well as their types of social networks. Men were involved in other businesses, including transportation, selling of cattle, wholesale shops, and mobile network distribution. Women in the FGDs mentioned farming, and petit trading as major sources of finance, and they mentioned that this was still not enough to run the business successfully. Women relied on their husbands for additional financial support, using revenue generated from his business.

3.5.3 Storage

Good storage was required to preserve the quality of the grain. Access to good storage enabled the buyers/traders to stock the legume during harvest when prices are much lower (supply greater than demand), empowered them to postpone the sale of the legumes to when prices are higher, and importantly enhanced the buyers/traders bargaining power with export market buyers/processors. According to the respondents, storage was critical to ensuring that they remain profitable in the business. The high risk of the legume being damaged by insects during storage also required that some investments be made on pesticides to preserve the quality of the grain prior to selling. The difference between men and women buyers/traders in available capital was also evident in the difference in the size of the business and access to storage. All male respondents seemed to have relatively larger businesses and owned separate and larger storage units/warehouses where the grain was treated (sorting, winnowing, pesticide application) and bagged for sale. A woman who reported being the manager and primary decision maker of her business stored her inventory within her home.

3.5.4 Transportation

Access to transportation is another essential resource required when purchasing the grains from farmers in dispersed markets as well as when transporting the grains to Blantyre or Limbe for sale to large export buyers. Four of the nine men interviewed reported owning their own vehicles for transportation. With the exception of one man who owned a bicycle that he uses to transport grain to export buyers, the other men reported hiring/renting a vehicle or bicycles to transport grains when needed. Of the two women interviewed, the one who referred to herself as the major decision maker for her business did not own her own transportation. She used minibuses or public transport to take the grain to Blantyre to sell when she has less than five bags to sell, or she hires a vehicle to transport the grain when she has more than five bags to sell. The other woman who managed the business with her husband indicated that they owned their own vehicle for transportation. There appears to be some positive correlation between the size of the business and ownership of transportation.

3.5.5 Mobility Constraints

Cultural restrictions on women's mobility limit their participation as buyers/traders of pigeon peas. The respondents revealed that unlike men, the expectation that women are responsible for childcare and household responsibilities limits their mobility. Buying and trading of pigeon peas was described as involving travelling to villages/locations

with high pigeon pea supplies to purchase the legume. Such travels could last about a week and involve going from one village to the other until the necessary supplies are purchased. One of the women we interviewed observed that she did not travel to anywhere to buy supplies. She operates in her home and she lives in a market. Farmers would sell directly to her when they come to the market. Unlike men, this woman was less likely to commission vendors to supply her with a specified quantity of pigeon pea for a predetermined price per quantity.

3.5.6 Labor

The use of hired labor was very popular among buyers/traders of pigeon peas. Most of the respondents indicated that they used some type of hired labor. Hired labor was categorized as either permanent or casual/seasonal. The number of hired employees ranged from 3-10 persons. The employees were responsible for almost all activities associated with the business (offloading trucks, head transportation, weighing, counting and calculating, shop/store cleaning, sewing the bags, sorting, winnowing, and bagging), except for buying or trading. Buying and trading involved handling large sums of money and the owners of the business preferred to do these themselves due to issues associated with lack of trust in the employees. Most of the respondents revealed a preference for male employees. They explained that they desired someone who can handle all the activities associated with the business, so that they can reduce the cost of employees to themselves. Very few of the respondents indicated using women as hired labor. As paid laborers, women were mostly needed for activities like sweeping/cleaning of the shop, sewing of bags, sorting and winnowing. They explained that women were more patient and careful; as a result, they do a better job when it comes to these activities, unlike men who had a hard time performing activities that require them to sit down for too long. Even women in the role of buyers and traders expressed a preference for male laborers to help them perform activities perceived to be physically demanding in the absence of their spouses. For instance, a woman explains the reason for less women employees: "First of all the bags are very heavy for women to be able to carry about 40 in a day, second, most of the women in the community are married and can therefore not work overnight as the job demands."

Overall, we found strict gender division of roles and the division of roles reinforces traditional stereotypes on what roles are considered appropriate for men or women in these communities. The discussion with the traders/buyers revealed clearly that women (hired employees or farmers selling their grains) had a comparative advantage in performing activities that enhance the quality of the grain (value addition), such as winnowing and sorting. Opportunities to support women's participation in value addition could potentially be economically empowering.

3.5.7 Business Knowledge, Bargaining, and Negotiation Skills

Knowledge about the quality of the grain desired by the export buyers/processors, knowledge about markets, bargaining and negotiation skills, computing profit margins, and maintaining good relationships with your suppliers were essential requirements for buying/trading of pigeon peas. With the exception of one trader who had received training in Blantyre covering topics such as grain buying,

checking for moisture content and quality and other grain quality requirements, none of the traders had received any business related training. While there are no official grades and standards requirements for grains, the respondents indicated that the quality of the grain has to be good to sell for a higher price. Specifically, the grain has to be free of stones, pest and grass, and has to be dry enough to allow further processing by the export buyers/processors. Grain was inspected visually for any defects.

Occasionally, the export buyers/processors would refuse to buy grain of lower quality. According to the respondents, the price they paid the farmers and vendors who supplied grain to them was also influenced by the quality as well as the quantity offered for sale. Sometimes, the buyers need to perform some additional drying of the legume. Further, the respondents indicated that they have to wait for authorization from the government before they could start buying grains from farmers or vendors. Part of the reason for this was to ensure that moisture content of the grain goes down to a certain level before commercialization. There was a perception among men buyers/traders that women lacked business knowledge of this kind.

The two women interviewed had as much formal education as the men interviewed. One of them was the main person involved in the business, and had spent three years in the business. Most of the men had over ten years of experience in the business and had not received any business training. Perhaps, business knowledge was correlated with the duration of the business.

The respondents also reported that bargaining and negotiations skills were very important for success in the business. As explained by the respondents, frequent price fluctuations and high competition among the many export buyers/processors requires that they are able to negotiate for better prices in order to remain profitable. Most of the men interviewed indicated that one of the reasons why there are few women in the business is because they lack negotiation and bargaining skills. They explained further that the business is very risky as sometimes they transport their grains to Blantyre for sale and upon arrival there, the export buyers/processors would inform them of a drop in price. This makes marketing financially risky, and even more so if a hired vehicle was used in transporting the legume to Blantyre, as not being able to negotiate for a better price and not selling at the price offered would result in incurring an additional cost to take the grains back to their storage. The respondents mentioned women especially would have difficulty dealing with such situations. Discussions with women supported these claims to some degree. Specifically, she observed that she needed her husband or brother in-law to go with her to Blantyre to negotiate better prices for her legume. Otherwise, she will be cheated.

The business was also described as very risky and dangerous for women because it involves carrying around huge amounts of money or several bags of legumes and women are more likely than men to be victims of theft and vandalism. The perception that the business was labor intensive/physically demanding, and the cultural stereotype that women are not strong enough to carry out these activities limited women's participation at this node of the value chain.

Interpersonal, communication and relationship management skills were also identified as essential for this business. As put by one respondent:

"You must be able to maintain a good relationship with farmers and vendors else they would not sell to you. You must understand farmers' problems. For instance, when farmers come to him saying they do not have money for seeds, he gives them seeds on credits or loans seeds to them and the farmers pay for the seeds when they harvest. This way, farmers are encouraged to sell to you when they harvest."

Further, it was observed that the farmers have to be able to trust that you are using the correct scale to measure the grains they bring to you.

Figure 6. GCFSI Graduate Research Assistant, Danielle Ami-narh Interviewing a Pigeon Pea Buyer/trader in Thyolo District

3.5.8 Access to Market Information

Access to reliable market information, especially price information was mentioned as a critical resource in this business. The data revealed that buyers obtained information on prices by calling the export buyers/processors in Blantyre. Respondents also travelled to Blantyre to check the buying price from the export buyers, or with other traders in the market. Frequent price fluctuations required them to regularly monitor the price that is being offered. One of the respondents mentioned that even with regular price checks, it is common to find out after paying the farmers /vendors that they just paid a price that is higher than what the export buyers/processors are willing to pay for the grain. According to one woman, in times like this, storage is very critical because if you cannot store to wait for better prices you will be selling at a loss. The respondents revealed that the buying price with the export buyers/processors at times change even several times in a day. The respondents observed that having accurate information on the buying price with the export buyers/processors could help them determine easily the price at which to buy from farmers by factoring in their transport cost and other costs. According to the respondents, high competition among the buyers/processors and highly fluctuating prices also made contracting very difficult.

3.6 LARGE-SCALE BUYERS AND PROCESSORS

Key informant interviews were conducted with representatives of large-scale export market buyers and processors of pigeon pea in Blantyre to understand their role in the pigeon value chain and to identify general and specific challenges associated with participation at this level of the chain. The research team scheduled interviews with AGORA, Export Trading Group (ETG), Rab Processors, and Transglobe, INC., all of which are privately owned. All the companies are involved in the buying and exporting of pigeon peas and other commodities (cowpeas, grams beans, groundnuts, soybeans, sunflower, and even maize.) The companies also sell farm inputs

(e.g., fertilizers) and building/construction materials (such as iron and zinc sheets) to farmers. Each company has its areas of operation with several outlets/branches spread throughout the country. [9] AGORA is the only one of the companies we interviewed that is not involved in pigeon pea processing or transformation. The company exports dried unprocessed pigeon pea grains to export markets. ETG, Rab Processors, and TransGlobe, each own a processing plant where pigeon pea is processed into *dhal*[10] and sold in the export market (in addition to the exported dried grain).

3.6.1 Operation

The companies recruit buyers, train[11] them and place them in their branches for the buying of pigeon peas. Unlike the other companies, TransGlobe and sellers (traders) brought their grains directly to their office locations in Limbe, Blantyre, and Lilongwe. For the other companies, pigeon pea grain is usually purchased directly from farmers who haul their grains to the buying branch or from vendors/middlemen/traders who aggregate from farmers to sell to large export market buyers. The majority of the buyers are men. According to the respondent from AGORA, 50 percent of the recruited buyers are usually women. However, women give up in the process because most of them find it difficult to stay in the villages where they are assigned. As a result, the company usually ends up having about 70 percent of their buyers being men and 30 percent of them women. Another key challenge associated with hiring women to work as buyers of pigeon pea identified during the key informant interview is the difficulty that women have carrying heavy loads or lifting bags. Additionally, it was observed that women buyers have difficulty negotiating for products from the seller (farmer or vendor) or convincing the seller to sell to them. In contrast, men buyers were noted to be much more aggressive in pursuing and convincing the seller to sell to them. Respondents explained further that when they go to markets to buy the legume, a man buyer would run faster towards the seller (usually farmers who bring to the market), dispossess the seller of the grain, and rush the grain to the vehicle before beginning any negotiation with the seller. According to one respondent, "Women cannot do this faster than men."

3.6.2 Pigeon Pea Varieties and Quality

The interviews revealed no strict preferences with respect to the quality of pigeon pea purchased. The companies buy everything that looked like pigeon pea. However, the buyers require that the grain be free of impurities (dusts, stones, and metals) and the grain must be dry enough. While having the appropriate moisture content came out to be an important quality requirement for purchased grain, no formal check for moisture content is conducted. Moisture content is usually inspected visually and by using one's teeth to break the pigeon pea grain. Respondents frequently differentiated between pigeon pea varieties by their red or white color.

[9] For example, AGORA operates in the area from Golomoti (Central region) through Monkey Bay to Nsanje (South region). ETG operates in Balaka, Ntcheu (especially in Boma) and Thondwe.

[10] Two varieties of dhal were mentioned: the oily and the polished.

[11] Training on product knowledge, grain quality, and basic math skills.

While both types of grains are purchased, the interviews revealed that the red variety usually receives a lower price because, unlike the white variety, which is easier to dehull, the red has a harder external coat that makes it difficult to process and increases the risk of damaging the processing equipment.

3.6.3 Procurement of Pigeon Pea Supplies

The export buying companies bought most of their pigeon pea supplies through vendors/middlemen and traders. The respondents reported that only about 30 percent of their total supplies were purchased directly from farmers. The discussions revealed that the majority of the vendors/middlemen/traders were men. Very few women traders, estimated to be no more than five percent, traded directly with the large export market buyers. In contrast, women constitute the majority of the farmers who sold pigeon peas to the export market buyers. The informants explained that women farmers were more likely to come looking for buyers of their pigeon peas because they are always in need of money to buy relish and/or other food for their families. Cash payments are made to all sellers of pigeon peas. The key informants note differences in the quality and quantity of the grain received from women farmers and vendors/middlemen. According to the informants, quality problems (stones, metals, dust, high moisture content) are more common with grain purchased from middlemen/vendors or traders. Middlemen often buy immediately after harvest and due to lack of storage they want to sell immediately. As a result, they pay less attention to the quality of the grain. Vendors often cheat by putting stones in the pigeon pea bags. In contrast, women farmers usually sell smaller quantities to their branches but their grain is usually of better quality than the grain from the traders or middlemen. Women are also less likely to cheat.

There are many competitors in the business of buying pigeon peas for large-scale processing or for direct exportation. Most transactions occur as one time, on the spot exchanges. However, informal long-term relationships exist between the large-scale buying companies and vendors/middlemen/traders, whereby the latter regularly supply pigeon peas to the former without a formal agreement/contract. Further, by being able to supply farm inputs and building materials to the farmers, a relationship of mutual trust and understanding is established with the farmers. Notwithstanding, some of the respondents described the business environment as risky for any type of formal contracting. The lack of identity cards in Malawi was revealed as an impediment to forming long-term relationships.

3.6.4 Buying Price Determination Process

Most of the informants stated that the farmgate price for pigeon pea and other legumes were fixed by the government at the beginning of each harvesting season. According to the respondent from AGORA, farmgate prices for pigeon peas is announced via newspapers and radios earlier on in the harvesting season. However, because of huge competition from buyers affiliated with other export buying companies, they quite often would have to offer a little over the price of the government-determined price to win the legumes from farmers and other vendors. Vendors and traders call the companies to find out the price that the companies are buying at before bringing their stocks to the

branches. Vendors also get better prices than farmers because they usually have larger volumes, and to cover some of the cost that the vendor may have incurred in acquiring supplies from dispersed farmers. The presence of many competitors and frequent price fluctuations makes contracting difficult as a coordination mechanism.

3.6.5 Business Requirements for this Stage

Data revealed that requirements to operate as a large-scale buyer include: a license to operate, certified scales for weighing the legume (government officials randomly check to make sure that the correct scales are being used), and authorization from traditional authority to buy pigeon peas within their jurisdiction. The last condition helps to avoid frequent thefts, since unauthorized buying encourages theft of the commodity in the villages.

4. OPPORTUNITIES AND CHALLENGES

Export market buyers/processors reveal that current pigeon pea production level in Malawi is insufficient to meet the demand for local consumption as well as for the export market. Respondents from these companies jointly agreed that there is huge opportunity for this value chain because of the high demand for both processed (*dhal*) and unprocessed pigeon peas from Malawi in the export market. They observed that dhal from Malawi had a high protein content, making it very good for vegetarians. Export markets include India and other locations with high Indian population like South Africa, Singapore, Malaysia, the U.K., Canary Island, the U.S., and Canada. TransGlobe for instance mentioned that the company is building a new pigeon pea processing plant that would need about 600 tons of pigeon pea a month and an average of 7000 tons per year to be operating at optimal level and minimum cost. This new plant would increase their demand for pigeon peas. However, the quantity produced in the country would be insufficient to satisfy their needs and that of other processing plants in the country. Notwithstanding these opportunities, as representatives of the export buying/ processing companies observed the lack of certified/branded seeds remains a major challenge to the pigeon pea value chain in Malawi. Farmers' heavy use of recycled seeds was identified as a major factor limiting productivity of the legume. The companies unanimously agreed on the necessity to engage farmers in local seed production. Lack of irrigation was identified as another important challenge in pigeon pea production in the country. As observed by one of the representatives of the export companies, one-third of Malawi is made up of water; however, the country's water

Figure 7. Women Producers of Pigeon Peas in Ndilema Village, Dedza District, Central Malawi

resources are untapped and not currently utilized to their full potential. He noted further that most of what exists as irrigation is concentrated around the lake shore. Other challenges identified include:

- The lack of storage facilities by traders, which affects the quality of grain brought to sell as well as the price they receive;
- The landlocked nature of the country, which increases transport cost to export markets;
- Low education among farmers, where farmers have a subsistence mentality and do not see agriculture as a business; and high competition among export market buyers.

5. CONCLUSIONS AND IMPLICATIONS FOR FOOD SYSTEMS INNOVATIONS

The purpose of this study was to provide evidence that will help the GCFSI to answer its pilot implementation question in Malawi of "Where and how can multipurpose legumes be scaled for sustainable intensification of maize systems and what would the potential impacts be, in the medium term, across the food system in Malawi?" The research focused on pigeon pea as a multipurpose legume. A gender analysis of this value chain was based on our recognition that from production to processing, gendered patterns of behavior and resource allocation condition the activities of men and women value chain actors, the distribution of resources and benefits derived from value chain activities, and the efficiency and competitiveness of the value chain. As a result, efforts to scale multipurpose legumes must isolate the gender-based constraints that have implications for adoption or expansion at the farm level, or for the incentives to participate at post-production levels of the value chain from the general constraints in order to improve the design and targeting of solutions to address these constraints.

Overall, the study reveals that there is an opportunity to expand pigeon pea production in Malawi. In the North region, where land is not a limiting factor, this will take expanding the area cultivated to the legume and improving farmers' access to high-yielding seeds and profitable markets. In the South and Central regions, where land is a constraint and farmers are growing very small parcels of land, it will take expanding farmers' access to high-yielding pigeon pea seed varieties. Research is needed to produce short duration and pest resistant seed varieties.

To encourage adoption and expansion of pigeon peas, the reliability of the seed systems must be improved and mechanisms to stimulate farmers' demand for certified seeds must be identified. Potential innovations here would include ways of supporting local and/or private sector involvement in pigeon pea seed production and promoting farmers' access to profitable markets. Improving farmers' access to profitable markets will create an incentive for farmers to purchase high-yielding seeds. Furthermore, beyond seed production there is a need to support the delivery of seeds to farmers. The findings reveal that few buyers/traders are supplying farmers with seeds (sometimes on credit). However,

these are much dispersed. Improving the delivery of seeds is likely to facilitate seed consumption by farmers.

As attractive as the option of improving farmers' access to a profitable market as a way of stimulating the demand for improved seed varieties and increasing productivity may be, it is important to note that access to markets is gendered. Cultural restrictions on women's mobility limit their access to markets. Women are disadvantaged in terms of major resources required to participate in markets, such as bargaining skills, transportation, or resources required to pay for transportation services. Innovations to promote access to markets must consider the implications of these gender disparities in order to be successful.

Furthermore, gender differences in control over household production resources (particularly income) have implications for farm investment decisions, including the area of total cultivated land devoted to the legume, labor allocations to the legume, investments in seeds and other inputs required in the production of pigeon peas. Gendered priorities within the household and gender differences in preference for different crops imply that men and women farmers are not necessarily looking for the same attributes in a crop (for instance marketability versus food for the household). Therefore, innovations to improve the demand for certified seeds and expand production of the legume must consider intra-household decision making processes and gendered priorities that have potential impact on adoption and expansion.

The expansion of pigeon pea as a multipurpose legume requires that all actors involved in the production of the legume be incentivized. Intra-household gender relations that give men/husbands control over income allows expenditure behaviors that do not reflect the needs of all members of the household involved in the production of the legume. Problematically, this discord creates a disincentive to expand legume production beyond immediate household consumption needs.

Access to price information is very critical for actors at all points of the pigeon pea value chain. Frequent price fluctuations and price information asymmetries imply that innovations to improve the effectiveness/efficiency of trade and the wellbeing of actors along the value chain must support reliable access to price and other market information along the value chain. Further, they must consider any gender differences that exist in the use of different information channels. This research has identified common sources of information for actors at different stages of this value chain. However, it falls short of identifying any gender differences in the extent/degree of use of these different information channels. Innovations to improve the flow of market related information along the value chain would need to further investigate any gendered differences in the use of different information channels and consider these differences in the designing and targeting of potential innovations.

The findings reveal that pest damage is a major threat to pigeon pea production throughout the country. Farmers' lack of knowledge of appropriate planting intervals and other production techniques impedes effective pesticide application and yields. Innovative ways of building farmers' capacity for pigeon pea production would also be very useful in efforts to scale out the legume. Farmers will need to be educated on profitable crop diversification techniques that can allow them to produce maize for

consumption, and to capture market opportunities for the other crops they produce to maximize returns to land.

Potential innovations should also focus on ways of organizing farmers to improve their bargaining power and hence their ability to fetch better prices for their commodities. The practice of selling small quantities as individuals by farmers, frequent price fluctuations and the tendency for vendors and export market buyers/processors to offer low prices to farmers (especially women), places farmers at a disadvantage. The low prices received by individuals act as a disincentive to expanding legume production. Compared to other countries in Sub-Saharan Africa, group action among farmers is very limited in Malawi and this was explained by lack of trust among smallholder farmers. Group action, if properly designed, would not only foster trust among farmers, but importantly, has potential to increase farmers bargaining power, increase volume available for sale, and enlarge access to capital. This would support investments in storage infrastructure, business training, and other resources necessary to ensure the profitability of their activities. Group action can also be beneficial to women who face mobility constraints. Through collective marketing, they could increase their total volume available for sale, thereby providing an incentive for buyers to come to them.

While promising, efforts to strengthen smallholder farmers through collective action, could also have undesired negative effects on women. Farmer groups have been shown to positively impact prices that farmers obtain as well as the promotion of innovation, but have also been found to diminish women farmers' control over production and sales of some crops if women are not provided full membership into these groups. Further, the benefit-sharing mechanisms in farmers' groups could be influenced by cultural norms that prescribe unequal gender relations and confer upon men a higher status and decision making authority. Gender sensitivity is therefore required in approaches/models to organize farmers to act collectively.

The findings reveal the need for innovations that support women farmers to move up and down the value chain, thereby increasing their direct income benefits from participation in the chain. The knowledge that women farmers have about the legume and their role in seed selection and storage, and the risk of men appropriating the crop when access to profitable markets is improved, make women farmers' potential candidates for involvement in local seed production. Furthermore, innovations that support women farmers to participate in downstream activities such as small-scale processing of pigeon pea are likely to increase returns, given that the retail price of pigeon pea is about three times the farmgate price. Existing evidence on the food security and nutrition benefits of improving women's control over income is compelling.

Promoting gender equitable opportunities in terms of access to resources and income-generating opportunities is necessary for promoting adoption and participation at different levels of the chain. The findings reveal that women are concentrated at points along the value chain with minimal resource requirements, and that are flexible in terms of allowing them to perform their culturally defined role as homemakers. These inequalities with respect to access to resources or opportunities for income generation limit business investments. For instance, lack of

resources limits access to storage for women retailers and buyers/traders of pigeon pea, thereby having implications for the profitability of their businesses. Scaling pigeon pea would necessitate identifying innovative ways of enhancing women's access to the resources required for their businesses to be profitable (finance, business training), and importantly improve their role in decision-making and control over those resources.

Overall, crop adoption and better market conditions do not necessarily guarantee food security and poverty reduction. Intra-household dynamics and gender relations privilege men's control over income from pigeon pea sales and shape whether or not expansion in pigeon pea production could contribute to improved food security and poverty reduction within the household. Empowering women economically is essential for the harvesting of the potential food security and poverty reduction benefits of legume expansion and commercialization.

APPENDIX A

GUIDING QUESTIONS FOR INPUT SUPPLIERS

A. TYPE OF BUSINESS OWNERSHIP

1. *Who owns this business?*
   Man Woman Joint group
2. *Which inputs do you sell/distribute?*
   Fertilizers Seeds others
3. *Do you sell legume seeds?*
   Yes No
4. *If yes, which legumes seeds do you sell?*
   Groundnuts soybeans common beans cowpeas pigeon peas others
5. *If no, please explain why you do not sell pigeon pea seeds*

B. *ACCESS TO FACTORS OF PRODUCTION*

1. *How did you get start-up capital for your business?*
   Personal savings Bank loans informal credit other
2. *How did you obtain the legume seeds that you sell? (response by specific legume seeds sold)*
   Self-produced large-scale producers seed producer association farmers'
   Agricultural research institutions other
3. *For which legumes do you carry improved or hybrid seeds?*
   Groundnuts soybeans common beans cowpeas pigeon peas others
4. *Reason (s) for stocking improved varieties for each legume type identified in (3)*
5. *Specifically for pigeon peas, what varieties of seeds do you carry in your inventory?*
6. *Where do you get information and training on business related topics? For instance, information/training on seed quality, seed storage practices.*

C. *PRACTICES AND PARTICIPATION*

1. *Do you have employees?*
   Yes No
2. *How many of your employers are:*
   Women men
3. *Please list all activities associated with the operation of this business and specify who does what?*

Activities	*Who does what?*		*Why?*
	Men	*Women*	

4. *Who are your main customers for different types of seeds?*
   Farmers micro seed retailers others

5. *For each type of seeds in your inventory, which group of farmers do you mostly sell to and why?*

Seed type	*Producers*		
	Men	*Women*	*Explain*
Maize			
Groundnuts			
Pigeon peas			
Soybeans			
Common beans			
cowpeas			
Others			

6. *Are there differences in the purchases (quantity and quality) of seeds demanded by women and men producers?*
7. *Please explain*
8. *What in your opinion is the reason for such differences?*
9. *What other differences in seed demand behavior do you observe between men and women seed customers?*
10. *How do you package your seeds to satisfy the needs of men and women producers?*
11. *What other adjustments do you have to make to accommodate the needs of men and women seed customers?*
12. *What additional services do you offer to your seed customers?*
    Loans *training on seed/input use information on seed planting* *information on seed storage*
13. *Do you sell seeds on credit?*
14. *What differences exists between men and women in the method of seed purchase?*

Seed method of payment	*Producers*	
	Men	*Women*
Cash		
On credit		
Subsidies		
Other (specify)		

15. *What are the major challenges/difficulties you experience in running your business? Please explain.*

D. *KNOWLEDGE AND BELIEFS*

1. *Who has more knowledge when it comes to seed quality/seed characteristics and other seed related information?*
   Men *women*
2. *Explain the reason (s) for your answer to the question above.*
3. *Are there differences in men's and women's preferences in purchasing legume seeds (in particular pigeon peas seeds), e.g., timing, pricing, and size?*
4. *Do you believe there is a difference in how men and women use seeds in their legume (emphasize on pigeon peas) enterprises?*
5. *Do you believe women or men are better suited for particular jobs in this business?*
6. *What in your opinion could be done to promote seed consumption by pigeon peas and other legume producers?*

E. LAWS AND POLICIES

1. *Are there any laws/policies/regulations that you have to comply with in the running of your business?*
2. *Are there any regulations that make it hard for you to run your business?*

QUESTIONS FOR PRODUCERS

A. ACCESS TO FACTORS OF PRODUCTION

1 How the main farmland is usually acquired in this region?

Inheritance Buying Lease Clan Village allocation other (specify)

2 Who typically owns the land within the household or under whose name is the land and what type of rights do they have and what

3

Land rights	Who owns			
	Men/husbands	Women/wives	Joint	Others (specify)
Title deeds				
Customary rights				
User rights				
Other(specify)				

4 Which crops are grown on the main farming land of the household? List them

Maize tobacco groundnuts

5 If pigeon pea is grown on the main farmland, who makes decision on how much land is allocated to pigeon peas? Husband/man wife/woman joint other(specify)

6 If pigeon pea is not grown on the main farming land, how is the land on which pigeon peas is grown usually acquired?

7 What resources other than land are important in the production of pigeon peas?(check all that apply)

Labor/time Fertilizers Seeds Knowledge/skills/information others (specify)

8 What major sources of labor are used in the production of pigeon peas?

Family Hired labor both

9 How do men/women farmers usually raise cash when needed?

Major Source of Cash	Men(yes/no)	Women(yes/no)
Sell labor		
Sell crops and crop products		
Sell livestock and livestock products		
Credit/loans		
Others (specify)		

10 Where do men/women producers usually obtain the pigeon pea seeds that they plant?

Own/recycled seeds purchase gifts

11 If purchased, from who did you buy them (identify them)?

Agrodealers/ retail shops seed producer association farmers' association others

12 *How do men/women farmers usually pay for the seeds?*

Payment Method	***Men***	***Women***
Cash		
Loan/credit		
Labor		
Other (specify)		

13 *What are your major concerns about pigeon pea seeds, for instance, seed availability (quantity and quality), seed cost, etc.?*

14 *How do men and women farmers usually obtain farm business related information (e.g., information on farming practices and market prices, etc.)?*

Source of Information	***Men***	***Women***
Radios		
Cell phones		
Friends		
Producer organizations		
Demonstration plots		
Input suppliers		
Agric. Extension		
Social groups		
Farmer field schools		
Other (specify)		

15 *What factors influence farmers' decisions to be part of a producer/farmer association?*

16 *How are these factors different for men and women farmers?*

B. PRACTICES AND PARTICIPATION

Legume Production

1 *Which legumes do most households grow in this district and why?*

Legume type	***Grown (Yes or No)***	***Reason for growing them (check all that apply)***
Groundnuts		*a. Eat them/our culture* *b. Sell them* *c. Soil fertility* *d. Other reasons*
Pigeon Peas		*a. Eat them/our culture* *b. Sell them* *c. Soil fertility* *d. Other reasons*
Soybeans		*a. Eat them/our culture* *b. Sell them* *c. Soil fertility*

		d. Other reasons
Cowpeas		a. Eat them/our culture b. Sell them c. Soil fertility d. Other reasons
Common beans		a. Eat them/our culture b. Sell them c. Soil fertility d. Other reasons
Others		

2 Within the household, do women and men grow separate plots?
3 If yes, please explain
4 In male headed households who typically makes decisions on which legumes are grown and why? Note: understand how access to inputs and gender roles influence decision to grow specific legumes.

Legume Type	Decision Maker				Explain why.
	Husband/ AM	Wife/AF	Joint	Other (specify)	
groundnut					
Pigeon peas					
Soybeans					
Cowpeas					
Common beans					
Other (specify)					

AM=Adult Male AF=Adult Female

5 Which pigeon peas varieties are common in this community? List them and find local names) and why?
6 Who makes decisions or selects what specific pigeon pea variety to plant and why?
Note: looking to understand how gender roles and gender disparities in assets influence adoption of different legume varieties.

Who makes decision	Explain why.
Husband/ other male	

Wife/other female	
Joint	
Other (specify)	

7 *Who typically carries out specific activities in the production of pigeon peas and why? Note. To understand gender division of labor in pigeon pea production.*

Activity		***Performed by***					***Explain why***
	Husband/ AM	*Wife/ AF*	*Child*	*Hired Male*	*Hired Female*	*Other (specify)*	
Seed production							
Seed storage							
Land preparation							
planting							
Disease & pest control							
weeding							
residue incorporation							
harvesting							
Storage							
transport							
Cooking							
Marketing							

8 *Pigeon pea cultivation practices. Note: to understand how gender roles and gender disparities in resources influence pigeon pea cultivation practices*

Who is?	***Most likely to cultivate pigeon peas from***	***Explain why***

	Seeds	Ratoons	
men			
women			

9 *Are there additional labor and other resource requirements associated with growing Pigeon peas*

10 *How do men and women farmers satisfy these?*

11 *What challenges in pigeon pea production are specific to women farmers? Please explain*

12 *How do women farmers overcome/deal with the challenges? Please explain*

13 *Other than the general challenges women farmers face in pigeon pea production, are there other challenges specific to women in female headed households producing pigeon peas? Please Explain.*

14 *What challenges in pigeon pea production are specific to men farmers?*

15 *How do men farmers overcome/deal with the challenges? Please explain*

Pigeon Pea Marketing

16 *What factors influence the decision to sell pigeon peas? Explain why.*

17 *Who within the household often makes the decision to sell pigeon peas?*
Husband/other male *wife/other female* *joint*

18 *Why? Please explain*

19 *Who decides how much pigeon pea is sold?*

20 *Who negotiates on the pigeon peas sales price*

21 *In what form is pigeon pea mostly sold?*
Dry grains *pods* *leaves*

22 *Where do you mostly sell your products*
Farm gate *local market* *others (specify)*

23 *Please, explain why.*

24 *What form of payment do you usually receive?*
Cash In kind (specify)

25 *Who are the major pigeon pea buyers from this community?*
Local consumers Rural intermediate buyers (middlemen) rural assemblers Urban retailers urban wholesale assemblers farmers association others (specify)

26 *How is the pigeon pea often transported/ to the market or point of sale?*

27 *Who takes the pigeon peas to the market to sell?*
Men women other (specify)

28 *What factors influence the decision to sell to consumers or other types of buyers?*

Control Over Income/Revenue From Pigeon Peas

29 *Who decides on how revenue/income from pigeon peas sales is spent*

Who	***Explain why.***
Husband/ other male	
Wife/other female	
Joint	
Other (specify)	

30 *How is the revenue from pigeon peas sales usually spent*
Food education health clothing rents/housing transportation others (specify)

31 *Are there any specific factors that limits women farmers' access to and participation in markets?*
32 *Please explain.*
33 *What in your opinion can be done to address these challenges?*
34 *Are there any specific factors that limit men farmers' access to and participation in markets?*
35 *Please explain.*
36 *What in your opinion can be done to address these challenges?*
37 *Are there any legume projects in this community? Please list them.*
38 *Are any of these legume projects specifically involved with pigeon peas? Please list.*
39 *What specific activities are carried out by the legume project?*
40 *In what ways have you benefited from the legume project (benefit related to pigeon pea production and marketing)*
41 *Explain how*

C. *KNOWLEDGE AND BELIEFS*

42 *Who, between men and women is more knowledgeable, and about what specific aspects of pigeon pea production?*
43 *Explain your reasoning.*
44 *Are there activities/roles in pigeon pea production and/or marketing that are difficult to undertake because you are a man or woman?*
45 *Are there activities in pigeon pea production that men or women are discouraged from doing? Please explain.*
46 *Who is more likely to attend training and technical meetings on legumes, men or women? Explain the reason for your answer*

D. *LAWS AND POLICIES*

47 *If the landowner dies are there laws that make it difficult for the spouse to inherit the land or property?*
48 *Are you aware of other law/ policies and regulations that are likely to affect you as a*

pigeon pea producer?

49 Please explain

QUESTIONS FOR PRODUCER ASSOCIATION MEMBERS & OFFICERS

A. ACCESS TO FACTORS OF PRODUCTION

1 Does membership in the producer organization facilitate access to any of the following resources?
Seeds fertilizers training/capacity building market information
markets cash/credit/loansextension services others (specify)

2 Do men and women members of producers association have equal access to these resources? Yes No
3 Please explain

B. PRACTICES AND PARTICIPATION

4 What is the criterion for membership in the association or group? What must you have to become a member of the producer association or group?
5 Are membership fees required to participate in these associations or groups? Yes or No
6 How often are the fees paid?
7 Is there a flat rate for every potential member? Yes or No
8 How many men and women are in the association or group?
9 How many members occupy leadership positions in the association or group (committee members)?
10 How many of those in leadership positions are women?
11 What must women have to occupy leadership positions in producer organizations
12 How often does the producer association hold meetings?
13 When are meetings held?
14 What time of the day are the meetings held?
15 *Where are they held?*
16 Is pigeon pea a key/main crop in this producer association?
Yes No

17 Please explain.

C. KNOWLEDGE AND BELIEFS

18 How does being a man or woman give a person any advantage or disadvantage in being a pigeon pea producer?
19 Do you believe that being a man or woman helps someone in running for an association office?

D. LAWS AND POLICIES

Are there any laws or policies that affect the activities of producer association?

QUESTIONS FOR BUYER/ TRADERS

Background characteristics

- *District or village name where buyer is based*
- *Man or woman*
- *In which age bracket do you belong? Below 18 18-25 25-40 40-50 above 50*
- *What is your marital status? Married Single Widow(er) other(specify)*
- *What is the highest level of schooling you have attained? No school Primary Secondary post-secondary High School college Adult literacy education post college*
- *How many persons are there in your household?*

A. ACCESS TO FACTORS OF PRODUCTION

1 *Do you own this business? Yes/No*
2 *If you are not the owner, what is your relationship with the business owner?*
3 *How many employees does this business have?*
4 *How many women and men are your employees?*
5 *Who is more involved in buying pigeon peas? Men or Women*
6 *Why? Please explain.*
7 *What makes it hard for women or men to become buyers or traders?*
8 *How do you identify the people you buy from?*
9 *Do you own your own transportation?*
10 *If not, how do you transport the grains from point of purchase to the point of sale?*
11 *Have you received any training on grain grades or quality requirements?*
12 *If yes, where did you receive the training, who trained you? List them*
13 *How did you obtain the initial startup capital for your business?*
14 *How do you generate additional capital for your business?*
15 *What other resources and skills are essential for the day-to day-operation of your business? Please list them and explain how?*

B. PRACTICES AND PARTICIPATION

16 *How long have you been trading legumes?*
17 *What activities are involved in the running of your business and who does what?*

Activity	*Who Does what*				*Explain why*
	Adult Male	*Adult Female*	*Both*	*Other*	

18 *Which legumes do you buy or trade? Why?*

Legumes	*Yes/No*	*Explain why*
Pigeon peas		

Groundnuts		
Common beans		
Soybeans		
Cowpeas		
Others (specify)		

19 Where do you buy your products? List the names of the markets and villages.

Legume	***Market/village***	***Explain why***
Pigeon peas		
Groundnuts		
Common beans		
Soybeans		
Cowpeas		
Others (specify)		

20 What factors influence your decision to buy pigeon peas from a particular vendor?
1) Nearness to roads 2) quantity available for purchase 3) quality of grain 4) Price requested

21 What factors influence the price you offer the seller for their grain?
22 How do you differentiate grains of different qualities?
23 Who do you often source your products from? Men women or both
24 Have you noticed any difference in buying from men and women? Please explain.
25 Who is more likely to meet both the quality and the quantity of grain that you desire?
Men Women

26 Please explain why
27 Please describe your business relationship with your suppliers. One time exchange/spot market contracts
28 Please explain
29 What forms of payment do you offer
Cash in kind (specify)

30 Who do you sell the grains to?
Urban Retailers Large-scale processors/millers Wholesalers

Others (specify)

31 How would you describe your relationship with them?
32 Do you undertake any value addition or conditioning for your products?
Yes No
33 Please Explain.
34 what specific challenges do you encounter as a man/woman running this business

C. KNOWLEDGE AND BELIEFS

35 What are the characteristics that make a successful buyer/trader?

36 *How does being a woman/man positively/negatively affect business practices and profitability? In other words, are there aspects of buying and trading that are believed to be easier or more difficult for men or women?*

D. LAWS/POLICIES

37 *Are there any laws or regulations that make it hard for you to carry out your business? Do these laws affect you differently because you are a man or a woman?*

QUESTIONS FOR RETAILERS/ LOCAL PROCESSORS

Background information

- *Location–market/village/district/region*
- *Ask if they are a retailer or local processor*

A. ACCESS TO FACTORS OF PRODUCTION

1 Are you the owner of this business?
Note: if yes, make a note of their sex and proceed to question 5

2 If you answered no to question (1), is the business owner a man or woman
3 If you answered no to question (1) what is your relationship with the owner of business?
4 If you answered no to question (1) what is your role in the day-to-day operation of this business?
5 Who is the main person involved in making decisions about the business?
Adult male Adult female joint other (specify)

6 What resources are critical to the running of your business?
Time skills/knowledge capita/money labor others (specify)

7 How did you obtain the startup capital required for this business
8 When you need additional cash for your business where do you get if from?
9 How do you obtain the labor required in running your business
Family hired friends/neighbor other (specify)

10 How many men or women employees do you have working for you?
11 How do you obtain prices (inputs) and other market related information?
12 Have you received any training to help you better run your business, for example training on business practices, training on grain quality and standards training on hygiene financial management others (specify)
13 Please explain
14 In which age bracket do you belong Below 18 18-25 25-40 40-50 above 50

15 What is your marital status (of person who owns/ makes business decisions) Married Single Widow(er) other(specify)
16 How many persons in each of following age bracket are in your household?
0-5 5-10 10-20 20-50 50 and above

17 What is the highest level of education you have attained?
No school Primary secondary post-secondary High School college post college Adult literacy education other (specify)

18 *Can you describe your decision to be a pigeon pea retailer or small-scale processor? What factors influenced this decision?*

B. PRACTICES AND PARTICIPATION

19 *What activities are involved in the day-to-day operation of your business and who does what and why?*

ACTIVITY	WHO DOES WHAT				WHY.
	AM	AF	Joint	Other	

AM=Adult Male AF=Adult Female

20 *Which legumes do you retail or process?*

LEGUME	YES	NO
Pigeon peas		
Groundnuts		
Soybeans		
Common beans		
Cowpeas		
Others (specify)		

21 *Do you sell more than one pigeon pea variety? (If answer to 20 was yes.)*
22 *Please list the varieties that you sell.*
23 *Explain why you sell these varieties.*
24 *How do you decide which grain variety to stock/sell/process?*
25 *How do you decide where to buy the grain from? Please explain*
26 *From whom do you buy the pigeon pea grain?*
Local farmers (rural) intermediate buyers (rural) urban retailers urban wholesalers others (specify)

27 *Please describe the business relationship between you with your suppliers.*
28 *Who are your pigeon pea customers?*
29 *How many of your customers are men or women? (estimated proportion)*
30 *What differences are there in the use of your services by men and women?*
31 *Do you always have supplies (quantity and quality) that meet their demands?*
32 *What are the hours of operation?*
33 *How do you combine your role as a retailer and your other roles(e.g., mother/father*
34 *Who decides on how the revenue you obtain from your business is spent?*
35 *How do you use/spend the profit you get from your business?*
Food housing education clothing health transportation other household expenditure others (specify)

C. KNOWLEDGE AND BELIEFS

36 *Are there any activities in your business that are difficult for a man or a woman to carry out? List activities and explain*

37 *What are the major challenges you face in the running of your business? Explain*

38 *Do you think these challenges would be different if you were a man or a woman? Please explain.*

D. LAWS AND POLICIES

39 *Are there any laws/policies that make it hard to operate your business? Please explain*

40 *Would these laws affect you differently if you were a man/woman?*

GUIDING QUESTIONS FOR PROCESSORS

A. ACCESS TO FACTORS OF PRODUCTION

1. *Who owns this business? Single male owner single female owner other types of ownership (specify)*
2. *Do you obtain supplies directly from farmers or through intermediate buyers?*
3. *How do you find pigeon peas suppliers (farmers/intermediate buyers)*
4. *Are you aware of men/women who own the farm businesses from which you buy?*
5. *Are you aware of men or women intermediate buyers of pigeon peas supplying to you?*
6. *Do you find there is any difference in the quality/quantity of product that you receive from men or women's farms?*

B. PRACTICES AND PARTICIPATION

7. *What are the hours of operation of your business?*
8. *How many employees (men/women?)*
9. *How do you support women employees in their roles as childcare providers?*
10. *How do you/your employees get to and from work?*
11. *What kind of jobs/activities are involved in the operation of this business, what skills are necessary for each activity, and who does what?*

Activities	*Required Skills*	*Who does What*		*Why*
		Men	*Women*	

12. *To whom do you sell the finished products?*
    Local consumers exporters others (specify)
13. *Do you provide any training to your employees?*
14. *What types of training? List them and explain*

15. *When is the training held?*
16. *Who is more likely to participate in the training?*
    Men or Women?
17. *Do you have more men or women as customers?*

C. KNOWLEDGE AND BELIEFS

18. *Are there aspects of processing that are believed to be more difficult for men women/men?*
19. *What is an example of such a task?*
20. *Are there types of jobs that men/women are discouraged from doing?*
21. *What is an example of such a task?*
22. *In your opinion, what are the major challenges associated with having a female employee? Explain*
23. *Do you believe that there are differences in the supply or quality of the product that you receive from men or women?*

D. LAWS AND POLICIES

24. *Are there laws or policies that make it hard for you to run your business*

REFERENCES

Alwang, J. and Siegel, P. B. (1999). Labour Shortages on Small Landholdings in Malawi: Implications for Policy Reforms. World Development, 27(8), 1461-1474.

Bezner-Kerr, R. (2005). "Informal labor and social relations in Northern Malawi: The theoretical challenges and implications of ganyu labor for food security*." *Rural sociology* 70.2: 167-187.

Bezner- Kerr, R., Shumba, L., Dakishoni, L., Lupafya, E., Berti, P. R., Classen, L., ... and Lupafya, E. (2013).Participatory, Agroecological and Gender-Sensitive Approaches to Improved Nutrition: A Case Study in Malawi. Submission to the FAO Expert Meeting 'Nutrition-Sensitive Food and Agriculture Systems' in preparation for ICN+21.

Bie, S.W. (2008). Agriculture in the time of HIV/AIDS. *A report on the situation in Sub-Saharan Africa prepared for Norad. Noragric Report*, *42.*

Chirwa, E. and Matita, M. (2012). Factors influencing smallholder commercial farming in Malawi: a case of NASFAM commercialization initiatives. *London, Future Agricultures Consortium.*De Schutter, O. (2010). Food Commodities Speculation and Food Price Crises: Regulation to reduce the risks of price volatility. *United Nations Special Rapporteur on the Right to Food Briefing Note*, *2*, 1-14.

Food and Agriculture Organization of the United Nations (FAO). (2009). State of Food Insecurity in the World 2009. Rome.

FAOStat (2012). http://faostat3.fao.org/home/index.html#DOWNLOAD, accessed 15.11.14Giller, K. E., Corbeels, M., Nyamangara, J., Triomphe, B., Affholder, F., Scopel, E., and Tittonell, P. (2011). A research agenda to explore the role of conservation agriculture in African smallholder farming systems. *Field crops research*, *124*(3), 468-472.

Haddad L, Hoddinott J, Alderman H. (1997). Intrahousehold Resource Allocation in Developing Countries: Models, Methods, and Policies. Washington, DC: International Food Policy Research Institute.

Hillenbrand, E. (2010). Transforming gender in homestead food production. *Gen Dev.*, 18:3, 411-425.

Kamanga, B. C. G., Waddington, S. R., Robertson, M. J., and Giller, K. E. (2010). Risk analysis of maize-legume crop combinations with smallholder farmers varying in resource endowment in Central Malawi. *Experimental agriculture*, *46*(01), 1-21.

Kanyama-Phiri, G.Y., Snapp, S.S., Minae, S. (1998). Partnership with Malawian farmers to develop organic matter technologies. Outlook Agric. 27, 167–175.

Kanyama-Phiri, G., Snapp, S., and Wellard, K. K. (2000). Towards integrated soil fertility management in Malawi: incorporating participatory approaches in agricultural research. ICRISAT.

Makoka, Donald. (2009): Small farmers' access to high-value markets: what can we learn from the Malawi pigeon pea value chain? http://mpra.ub.uni-muenchen.de/15397/1/MPRA_paper_15397.pdf

Mafongoya, P. L., Kuntashula, E., and Sileshi, G. (2006). Managing soil fertility and nutrient cycles through fertilizer trees in Southern Africa. *Biological Approaches to Sustainable Soil Systems, Taylor and Francis*, 273-289.

Matua, E., Njuki, J. and Waithanji, E. 2014. Review of Gender and Value Chain Analysis, Development and Evaluation Toolkits. Nairobi, Kenya: International Livestock Research Institute (ILRI).

Mayoux, L. and G. Mackie. (2009). "Making the Strongest Links: A practical guide to mainstreaming gender analysis in value chain development" Geneva: ILO.

Meinzen-Dick, R., Johnson, N., Quisumbing, A., Njuki, J., Behrman, J., Rubin, D., Peterman, A., and Waithanji, E. (2011). Gender, assets, and agricultural development programs: A conceptual framework. CAPRI Working Paper No. 99.

Mhango, W. G., Snapp, S. S., and Phiri, G. Y. (2012). Opportunities and constraints to legume diversification for sustainable maize production on smallholder farms in Malawi. *Renewable Agriculture and Food Systems*, *28*(03), 234-244.

Nimal-Jayantha, H. M. and Saxena, K. B. (1998). A new small-scale processor for pulses. ICRISAT Information Bulletin No. 54, 1998.

Osmani, S. and Sen, A. (2003). The hidden penalties of gender inequality: fetal origins of ill-health. *Economics and Human Biology*, *1*(1), 105-121.

Phiri, A. D. K., Kanyama-Phiri, G. Y., and Snapp, S. (1999). Maize and sesbania production in relay cropping at three landscape positions in Malawi. *Agroforestry Systems*, *47*(1-3), 153-162.

Prasanna, B. M., Vasal, S. K., Kassahun, B., and Singh, N. N. (2001). Quality protein maize. *Current Science-Bangalore-*, *81*(10), 1308-1319.

Rubin, D. and Barrett, N. K. (2009) Gate Workshop Materials: Integrating Gender in Agricultural Value Chains (INGIA-VC) in Tanzania. Report prepared for Development and Training Services, Inc. (dTS).

Rubin, D., Manfre, C. and Barrett, K. (2009). "Promoting Gender Equitable Opportunities in Agricultural Value Chains" Handbook, Washington, CC, USA: USAID.

Sebstad, J. and C. Manfre. 2011. FIELD Report 12: Behavior change Perspectives on Gender and Value Chain Development: a Framework for Analysis and Implementation. Field-Support LWA. Washington, D.C.: ACDI/VOCA and FHI 360.

Simtowe, F., Shiferaw, B., Abate, T., Kassie, M., Monyo, E., Madzonga, O., and Muricho, G. (2009). Assessment of the current situation and future outlooks for the groundnut sub-sector in Malawi. *International Crops Research Institute for the Semi-Arid Tropics.*

Snapp, S.S., Rohrback, D.D., Simtowe, F., and Freeman, H. A. (2002). Sustainable soil management options for Malawi: can smallholder farmers grow more legumes? *Agriculture Ecosystystems and Environment* 91:159–174.

Snapp, S. S., Mafongoya, P. L., and Waddington, S. (1998). Organic matter technologies for integrated nutrient management in smallholder cropping systems of Southern Africa. *Agriculture, ecosystems and environment*, *71*(1), 185-200.

Snapp, S.S. and Silim, S.N. (1999). Farmer preferences for crop varieties in low nutrient environments. In: Adu-Gyamfi, J. (Ed.), Proceedings of an International Workshop on Food Security in Nutrient-Stressed Environments: Exploiting Plants' Genetic Capabilities. Japan International Research Center for Agricultural Sciences and ICRISAT, Patancheru, India, pp. 81–85.

Tschirley, D., Reardon, T., Dolislager, M., and Snyder, J. (2014). The rise of a middle class in East and Southern Africa. World Institute for Development Economics Research.