SEED SYSTEM SECURITY ASSESSMENT

EASTERN ZAMBIA

An assessment funded by:

The United States Agency for International Development/
US Office of Foreign Disaster Assistance

December 2013

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Acknowledgements

Support from the US Office for Foreign Disaster Assistance of the US Agency for International Development made this work possible. The methodology and tools developed for this assessment were designed by Louise Sperling (CIAT) and Shawn McGuire (University of East Anglia) and contextually adapted. The training phase and first few days of the assessment were led by Louise Sperling and this guidance was instrumental in bringing together a diverse group under a common banner following a rigorous methodology.

CRS Zambia through the USAID-funded Mawa project provided logistical support. Thanks to Emily Burrows, Chief of Party, and Margaret Mwenya, CRS Senior Program Manager for Mawa project for laying the ground work for staff and partner participation and for their comments and contributions to the final report. Particular thanks for major input on in-country logistics and coordination to Geoff Heinrich of CRS Southern Africa Regional Office, also for his foresight in structuring the assessment launch and assessment feedback meetings in Lusaka to engender multistakeholder engagement and recommendations reflecting that participation and contribution to the final report.

The direct support of the Government of Zambia, starting from the Zambia Agricultural Research Institute (ZARI) and Seed Control and Certification Institute (SCCI) staff whose active participation in the assessment launch meeting in Lusaka helped to identify issues and actors for follow up in the assessment. Agricultural extension officers from the Ministry of Agriculture and Livestock (MAL) provided indispensable contribution and insights to this assessment. We are particularly indebted to Henry Malua of SCCI for his hard work and commitment to participate in the entire process across two sites:s a key informant, focus group facilitator, household enumerator, agro-dealer and trader interviewer, and analyst.

This study was made possible by many people and organizations directly and indirectly involved in seed systems in Eastern Zambia. Special thanks to the seed companies, agro-dealers, traders, seed producers, agro-processors, and farmers in Chipata, Katondo, Lundazi, Munyukwa, Mwase, and Jenda who availed their time as part of this study.

Acronyms

BDS	Business Development Services
C-FAARM	Consortium for Food security, Agriculture, AIDS, Resiliency and Marketing
CIAT	International Center for Tropical Agriculture
CSP	Community Seed Production
CRS	Catholic Relief Services
CARE	A large international NGO – no specific words associated with the acronym
CSO	Central Statistics Office
DiNER	Diversity for Nutrition and Enhanced Resilience
DMMU	Disaster Management and Mitigation Unit, Government of Zambia
DSD	Direct Seed Distribution
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus Group Discussion
FISP	Farm Input Supply Program
FRA	Food Reserve Agency
FtF	Feeding the Future
GART	Golden Valley Agricultural Research Trust
GDP	Gross Domestic Product
GIZ	German International Development Assistance Agency (formerly GTZ)
HH	Households
IARC	International Agricultural Research Center
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
LBG	Large Grain Borer
LWF	Lutheran World Federation
MACO	Ministry of Agriculture and Cooperatives, Government of Zambia (former name)
MAL	Ministry of Agriculture and Livestock (new name)
NGO	Non-governmental Organization
OFDA	Office of Foreign Disaster Assistance (USAID)
OPV	Open Pollinated Variety
QDS	Quality Declared Seed
SADC	Southern African Development Community
SCCI	Seed Control and Certification Institute, Government of Zambia
SIDA	Swedish International Development Agency
SPSS	Statistical Package for Social Science
SSSA	Seed System Security Assessment
SVF	Seed Voucher and Fairs
USAID	United States Agency for International Development
WFP	World Food Program
WVI	World Vision International
ZARI	Zambia Agricultural Research Institute
ZNFU	Zambian National Farmers Union

Table of Contents

Executive Summary 6

I. Introduction 13

II. Conceptual Framework for the SSSA 15

III. SSSA Methodology in Eastern Province, Zambia 17

IV. Population, Poverty and Agricultural Expansion in Eastern Province, Zambia 20

V. Seed Systems in Zambia 22

VI. Assessment Findings 27

VII. Assessment Recommendations 52

VIII. References 56

IX. Annexes 58

Action Plans, by site
Summary of team observations, across sites
Select household survey data tables

EXECUTIVE SUMMARY

A Seed System Security Assessment (SSSA) was carried out in two sites in the eastern Province of Zambia in June 2013. It reviewed the functioning of seed systems - both formal and informal - and looked at issues of seed access, availability, and quality. The work covered two Districts, Chipata and Lundazi, chosen to include diverse agro-ecologies and seed system constraints. These two districts are part of the five districts in the Feed the Future (FtF) zone of influence in Zambia and, as such, are supported by several USAID-funded implementing partners.

Field research comprised "formal" households interviews, community and woman focus group discussions, interviews and consultations with agro-dealers, traders, agro-processors, seed producers, local authorities, and staff working on agricultural projects in Eastern Zambia. In advance of this assessment, a background paper was also commissioned on seed systems in Zambia (see Chisi, 2013) and the current status of formal and informal seed systems.

The rationale for conducting a Seed Security Assessment in eastern Zambia was to:

- Promote collaboration among a multitude of seed system actors as there are significant agricultural investments in eastern Zambia – principally via USAID funding through the Feed the Future initiative. A seed system assessment can identify key system constraints and opportunities and provide a leverage point for improved coordination.

- Help CRS and partners – under the Feed the Future funded Mawa project in eastern Zambia (which targets 19 agricultural camps and 21,500 HH in the two districts of this assessment) – to gain a common understanding of seed system issues and opportunities and design effective seed system related activities.

- Define key points of integration between formal and informal seed systems and the public and private sector. This integration is in recognition that chronic seed aid in the form of project or government subsidies does not usually catalyze a sustainable seed system nor stimulate demand which can be met by a nascent private sector. Also, the private sector alone is not capable of meeting farmer demand for seed.

Key findings are presented below. These are divided between short-term assessment of seed security (for 2012-14) and longer-term possible chronic stresses and emerging opportunities.

ACUTE SEED SECURITY FINDINGS

1. This assessment revealed no significant acute seed security stress as evidenced by an overall increase in in sowing rates for the 2012-13 season of 7% and a projected increase in sowing rates of 63% for the 2013-14 season.

2. Among the minority of households indicating a reduction in sowing amounts in the 2012-13 and 2013-14 seasons, lack of money was the driving constraint. Lack of cash particularly affects sowing rates for purchased seed such as soybean, sunflower, or

common beans. The other key factors associated with declining seed use were linked to the general vulnerability of households (labor, health, poor weather, or constraints to land) and to lack of incentives due to poor market development.

3. A very small cluster of crops dominates production food production in the eastern province of Zambia. On a kilogram basis, seed of maize, groundnut and cotton accounted for 95% of the seed sown. This lack of crop diversification is especially disturbing given that the zone is drought-prone zone and that populations suffer from high rates of mal- and under-nutrition.

4. Seed sourcing channels vary by crop but are not diverse. The government, through FISP (Farm Input Supply Program), is a key source for maize seed with farmers reporting that the government as a seed source accounted for nearly 1/3 of all maize seed sown 2012-13 (with only 8% coming from agro-dealers directly).

5. Farmers are changing crop profiles in important ways—shifting out of cotton and investing more in sunflower and soybean.

6. There are some supply-side concerns for legumes and especially for groundnuts. The demand for groundnut seed is growing as farmers projected an increase in kgs of groundnut sown by 45% for the 2013-14 planting season. There are challenges accessing good quality groundnut seed (possibly linked to shortages in basic seed production). There are also post-harvest handling concerns as reflected by high levels of aflatoxin (see *Chronic stress section*).

7. Overall expenses for seed purchase seem relatively modest and affordable for most. For the routine crops cluster of maize, groundnut and cotton, costs are : Kwacha 38.7 ($US 7) for 2012-13 and Kwacha 73 (or $US 13.30) for 2013-14.

   The switch to soybean does result in a significantly heightened investment, 84 and 106 Kwacha for 2012-13 and 2013-14 respectively (or the equivalent of $US 15.27 to 19.25). Hence, for the 'routine crops', most farmers can likely meet the needed seed costs (recognizing that the very poorest may always be cash-stretched). However, the move to soybeans represents a much bigger investment in seed.

8. Overall, the communities themselves deemed their members as seed secure for the 2013-14 season.

Hence, the 2012-13 season was a stable if not promising one. There are some seed system stresses but these seem to be chronic ones, rather short-term constraints.

CHRONIC SEED SECURITY FINDINGS + EMERGING OPPORTUNITIES

The findings overview suggested that there are many chronic seed security stresses in eastern Zambia, coupled with a few identified positive innovations. There seems to be ample room for strengthening seed systems.

In summary:

1. There has been almost no dynamism in any seed channel. The only exception is with maize, where mobile vendors have jumped in to fill the gap of 'FISP seed frequently arriving late'—according to the community assessment.

2. There is appallingly little crop diversification. Maize was identified as first priority for food; cotton was first priority for income; and groundnut was identified as first priority for nutrition. Many of the other crops were grown in only minuscule quantities. Overall, crop transformation was very low, with little added value (and geared mainly toward household consumption).

3. The uniformity in crop use might normally suggest that these three crops (maize, groundnut and cotton) are providing 'relatively well' and are stable within the system. However, for two of staples, farmers cite important challenges and production volatility. Quality groundnut seed is difficult to access and maintain (possibly also linked to limited basic seed and aflatoxin incidence). The lowering prices for cotton means that many farmers are moving away from the crop, substituting sunflower or soybean in its place.

4. Overall, 72 % of farmers in the SSSA sample indicate they have accessed a new variety within the last five years. While this seems a relatively promising figure, closer scrutiny suggests access to new varieties to quite constrained: Over 80% of the new entries were maize or groundnut, with no farmer reporting accessing a new variety of key legumes such as common bean, cow pea, or pigeon pea.

5. About ¾ of the new variety accessions have been delivered free in the last five years (through government or NGO/FAOs). There are few sustainable delivery channels that can supply farmers with an array of new varieties on a continuing basis.

6. Decentralized seed multiplication initiatives are growing in the zone, especially in the last two to three years. This is a promising sign as such decentralized work will be key especially for the legumes and for the vegetatively-propagated crops. On the negative side, a) producer groups complain about lack or technical support and management capacity; b) coordination among groups is eastern Zambia is very limited; and c) capacity to validate quality (whether certified or Quality Declared Seed- QDS) is minimal. (It appears SCCI has only two inspectors for the entire Eastern Province).

7. In terms of inputs, mineral fertilizers, and pesticide foliar sprays are generally used by ½-3/4 of the population sampled. However, they are used near exclusively on maize and cotton (for 90-91% of the applications). Manure and compost are used to a lesser degree, on maize (61% of the sample) and on vegetables (17% of the populations). Many claim not to know how to use these organic inputs.

8. Storage losses are reported as very high. Maize particularly is damaged. Seventy percent of households report average storage losses of almost 40%. Equally troubling is farmer management response as many are using cotton pesticides for storing maize (i.e. chemicals which are potentially toxic if consumed).

9. Female-headed households face <u>many</u> seed security concerns to a degree which is statistically different from male-headed households. Female-headed households sow less; have accessed fewer new varieties in the last five years, less frequently use fertilizer

and manure./compost; and have smaller family sizes (perhaps leading to less access to labor). Also, as a key indicator of stress: for female-headed households, the government (FISP) is the main source of maize seed, with home-saved in second place. This is the inverse of the whole population.

10. Households with smaller areas for cultivation (i.e. a rough proxy for poorer households) also have significantly different patterns from those with more land. Two were noted: farmers with less than 1 ha are less likely to obtain a new variety than farmers with larger farm sizes. Also, large-sized farms are more likely to use fertilizer than smaller-sized ones.

For both 9 and 10, these trends merit further investigation. Simply, it seems the more vulnerable may have less access to innovations.

Having summarized the findings, we now move to recommendations for action.

RECOMMENDATIONS FOR ACTION

Based on the SSSA findings, concrete action plans have been detailed for each SSSA site (see Annex I). Here we recommend areas for action that crosscut sites and apply to eastern Zambia more generally. These are divided between 'short-term recommendations', that is areas where actions can and should unfold 'as soon as possible' (i.e. the next season), and 'medium term recommendations' where actions might be taken in the next 1-3 seasons.

Short Term Recommendations (immediate action needed)

1. **Use DiNER voucher and fair programs to increase diversity in smallholder farmer production systems.**

Seed Vouchers and Fairs (SV&F) (CRS, 2002) have been used successfully by CRS in Southern Africa for more than 5 years and have proven to be an effective means to assist smallholder farmers to re-start their cropping systems after a shock such as a flood, or in areas that endure chronic stress, such as drought. Diversity for Nutrition and Enhanced Resilience (DiNER) voucher and fair programs are an advance on the usual SV&F methodology in that they use the same basic approach, but add an additional element to ensure that smallholder farmers get access to diverse materials that are otherwise difficult to obtain in many rural areas. DiNERs (pioneered in Malawi 2012) have proved helpful for increasing the diversity of the production system – and thereby also increasing the resilience of the system and the potential for enhanced dietary diversity. Items which might be included in DiNER V&F programs in Eastern Province might include: tree seedlings (fruit, fodder, fertilizer, fuel); both local and commercial vegetables; sweet potato vines; cuttings of improved varieties of cassava; local and/or improved varieties of important legume crops (e.g., cowpeas); cereals; and small livestock. For increased benefit to communities and increased incentive to commercial company participation, both vouchers and cash sales might best be allowed in eastern Zambia DiNERs (though vulnerable farmers with vouchers should probably be given the first opportunities).

This activity could be led by the Mawa Project but would benefit from collaboration with other seed/planting material production programs in the Province, especially farmer-based seed production programs.

2. Catalyze a "small farmer oriented" seed production and marketing stakeholder group for Eastern Province with initial focus on vegetatively -propagated crops and legumes.

There are a large number of formal and informal seed production activities in Eastern Province, but they are not coordinated. This leads to considerable inefficiencies: for example, different groups purchase foundation seed for groundnuts from the same Foundation seed source in Malawi – with associated transport and clearing costs for each different shipment; farmer-based seed production groups produce seed but lack a market (which could be jointly developed!); some grower associations seek and fail to find seed of the same crops/varieties which others already have locally. Seed sector actors (MAL, ZARI, CGIAR, NGO's, Private Sector) need to establish a forum in eastern Zambia through which they come together and discuss how to improve coordination on the production and delivery of seed of varied types. The focus of this work initially should be on legume and vegetatively-propagated crops, since this is where the greatest need is at present. Compelling issues, such as relative lack of foundation seed for groundnuts, might be given immediate priority. Similarly, discussion of better marketing possibilities for seed of non-commercial crops should be explored. This forum could also share information on the performance and availability of improved varieties for Eastern Province and coordinate with SCCI to promote field inspections for farmer-based seed producer groups using 'quality declared seed' standards. The overall aim of such stakeholder forum would be to increase access to improved varieties of both commercial and non-commercial crops as an approach to increasing the productivity, nutritional options and resilience of smallholder farming systems.

Not all seed production would need to be farmer based, but all farmer-based seed production should be done for profit, with robust business plans, to assure sustainability (see recommendation number 4).

3. Establish a Working Task Force on Improved Storage Methods with focus on maize and legumes and identify a variety of storage options suitable for different farmer segments.

There is an urgent need to counteract storage losses in eastern Zambia. Seed sector actors (MAL, ZARI, CYMMT, IITA, NGO's, Private Sector) should establish a working task force on storage options for maize and legumes (and particularly cowpea), with a focus on small holders. This could be a sub-group of the seed production stakeholder group mentioned above. The fact that large grain borer is endemic, and the high reported loss rates of maize in storage during this SSSA suggest that a concerted effort is needed to evaluate and promote different storage options for maize. The known difficulties with storage of cowpea and other legumes, and their dietary importance, warrant a simultaneous concern with legume storage systems. Grain storage systems should be evaluated for their cost, effectiveness, safety, and access and adoption issues for farmers. The key steps for assessing storage issues include: a. Understanding the farming system, seasonality and practice; b. Estimating the extent of loss; c. Establishing basic trials to assess different storage methods in terms of efficacy and cost effectiveness; and d. Ensuring farmers and farmer organizations participate directly in the evaluations; d. Cost-benefit analysis at farm and project level for the storage technologies.

As a truly pressing need, the misuse and counterfeit labelling of pesticides needs to be addressed. The common use of cotton pesticide in grain and seed storage may have substantial health risks. Falsely labelled and counterfeit pesticide means that farmers may be getting inferior and even dangerous products. Hence, there is immediate need for a public information campaign and farm level training on the use of storage chemicals and on importance of distinguishing counterfeit from original products.

Medium Term Recommendations (for next 1-3 seasons)

4. Develop sustainable variety delivery systems, offering multiple channels.

New improved varieties are not reaching farmers through channels that are sustainable. (They are mostly being given as aid—and free). Also the heavy emphasis of new maize varieties is crowding out possibilities for moving a much larger range of genetic material, especially different kinds of legumes.

Delivery mechanisms for giving all farmers regular access to a range of new varieties need to be supported. Sale through agro-dealers provides only one venue but should be encouraged, especially in small pack sizes (100, 200, 500 g)—not the 5 kg now put on offer. Sale in regular country stores, open markets or even supermarkets (with proper labeling) might also be considered. In addition, agro-enterprise groups and seed loan groups (with clear marketing plans) might be formed around seed enterprise (point 5 below). In all cases, enhanced delivery options need to be complemented by vigorous media campaigns that help farmers make informed decisions about whether to use the new materials (e.g. through farm radio, or churches).

5. Identify and promote profitable decentralized seed production and marketing possibilities

The Seed Stakeholder group in Eastern Province should collectively assess and share lessons on effective and durable farmer-based seed (or planting material) production options for non-commercial crops. Comprised of farmers and representatives from MAL, ZARI, CGIAR, NGO's, and the private sector, this group should identify and promote farmer-based seed production models which:

- are commercially viable;
- can serve the entire value chain (home consumption needs, buyers and/or food processing companies); and
- are tied to continuing sources of new germplasm.

In all cases, farmer-based seed production groups should receive training in key skill sets and develop viable and sustainable business plans. They should also include innovative and effective seed marketing systems, such as the above-mentioned sales through small packs.

6. Build Farmer organizations at community level and enhance their technical and management capacities.

The FtF projects, along with private sector and backstopping and support from MAL and ZNFU, should build strong farmer groups and facilitate the development of strong linkages

between these groups and the private sector for input supply and output marketing. The strengthening of farmer groups would be in the form of building their capacities in key skill sets including: group organization and management, savings and financial management, sustainable production and natural resource management, innovation and business and marketing skills. Mawa has modules for front-line workers in all of these skill sets and is already planning to deliver them to some groups.

The medium term outcome would be to strengthen the farmer-market interface and make it more efficient and profitable for all concerned. The longer-term outcome would be to develop strong working relationships between farmers and input suppliers, output buyers, and business development services (BDS) that would make the whole system more durable, sustainable and scalable.

7. Investigate reasons for unusual seed security vulnerability among female-headed households.

The degree of multiple seed security stresses among female-headed households is alarming. Under-production of any group affects the whole economy of eastern Zambia. As a reminder: the SSSA showed that Female-headed households sow less; have accessed fewer new varieties in the last five years, less frequently use fertilizer and manure./compost; and have smaller family sizes (perhaps leading to less access to labor).

Each of these constraints needs to be understood in depth. Special gender-differentiated studies and analyses- need to be effected. Multiple strategies to alleviate possible stresses should be tested. Certainly, finding ways to allow female headed households to access new varieties should be an activity which can be promoted relatively quickly.

The above recommendations are relatively broad and are meant to complement the site-specific Action Plans (Annex 1). Given the chronically- depressed nature of seed security in eastern Zambia, there is considerable room for strengthening seed systems with a range of focused initiatives in a relatively short timeframe.

I. INTRODUCTION

A Seed System Security Assessment (SSSA) was carried out in two sites in the Eastern Province of Zambia in June 2013. It reviewed the functioning of seed systems - both formal and informal - and looked at issues of seed access, availability, and quality. The work covered 2 Districts, Chipata and Lundazi, chosen to include diverse agro-ecologies and seed system constraints. These two districts are part of the five districts in the Feed the Future (FtF) zone of influence in Zambia and, as such, are supported by several USAID-funded implementing partners.

Field research comprised "formal" HH interviews, community and woman focus group discussions, interviews and consultations with agro-dealers, traders, agro-processors, seed producers, local authorities, and staff working on agricultural projects in Eastern Zambia. In advance of this assessment, a background paper was commissioned on seed systems in Zambia (see Chisi, 2013) and the current status of formal and informal seed systems. The paper was presented at a pre-launch meeting in Lusaka in early June 2013 and aimed to build broad-based engagement in the seed system assessment and to gain insights on key seed system issues in Eastern Zambia. At the conclusion of field research, de-briefings were held in Lundazi and Chipata to discuss preliminary findings and recommendations. A summary of findings and recommendations across both sites was presented in Lusaka at the end of June 2013.

The rationale for conducting a Seed Security Assessment in Eastern Zambia was to:

- Promote collaboration among a multitude of seed system actors as there are significant agricultural investments in Eastern Zambia – principally via USAID funding through the Feed the Future initiative – and a seed system assessment can identify key system constraints and opportunities and provide a leverage point for improved coordination.

- Help CRS and partners – under the Feed the Future funded Mawa project in Eastern Zambia which targets 19 agricultural camps and 21,500 HH in the two districts of this assessment – to gain a common understanding of seed system issues and opportunities and design effective seed system related activities.

- Define key points of integration between formal and informal seed systems and the public and private sector - out of recognition that chronic seed aid in the form of project or government subsidies does not usually catalyse sustainable seed systems nor stimulate demand which can be met by a nascent private sector. Also, the private sector alone is not capable of meeting farmer demand for seed.

Note that the June 2013 assessment in Eastern Zambia is the second one to be conducted in the last few years. The first Zambian SSSA was conducted in 2010 in peri-urban and rural areas of the South and West with an aim to increase understanding of seed systems and key issues and options in order to design short and long-term interventions for the semi-arid areas of the country.

Key findings from that 2010 study were: There was no evidence of significant seed insecurity.

- Own saved seed was the most important seed source – even for maize.
- There was very limited access to seed of improved varieties (except maize).
- Agro-dealers were few in rural areas and tended to serve peri-urban famers.
- Some evidence suggested that free seed suppresses the private sector.
- For legume seed: saved, barter, and work for seed were most common channels.
- Local seed growers exist but were not effective due to lack of market strategy.
- FISP was very useful but there is need to improve its timeliness and targeting.

Key Recommendations from that 2010 study included:

- Avoid direct seed distribution because it discourages commercial input dealers.
- Relief interventions should work with agro-dealers and promote non-commercial crops.
- Local seed producers should be promoted through training on basic seed production, marketing and delivery systems, and improving links to ZARI for parent seed.
- Encourage crop diversification, particularly legumes, and fertilizer use through variety & fertilizer demonstrations and through subsidies (vouchers).
- Support local government to improve seed stakeholder coordination and promote market based input supply systems.
- Help the government to develop a national seed system security plan.

The June 2013 SSSA in Eastern Zambia was intended to build on what was learned in this earlier assessment and particularly to guide seed security interventions related to the USAID-funded Mawa, ongoing in the region since January 2013. The Mawa project is generally concerned with increasing the nutritional status and food security of vulnerable rural households in Eastern Province.

The June 2013 assessment provided a platform for different seed system actors to learn together and contextualize some of the earlier findings – particularly as related to understanding commercial opportunities and responding to chronic seed stress for the most vulnerable farmers – for Eastern Zambia. The SSSA was also intended to build assessment capacity by introducing a seed security analytic framework and a series of security assessment tools to allow for a rigorous but also participatory assessment by relevant seed system stakeholders and especially the Government of the Republic of Zambia (GoRZ) and Zambian civil society.

The major findings of this assessment were presented to stakeholders prior to the writing of this report. On Friday June 28th 2013, the findings and recommendation for both sites were presented to staff from different agencies within the Zambian Ministry of Agriculture (ZARI, SCCI), UN Agencies (FAO, WFP), The Zambia National Farmers Union, private sector seed companies (Zamseed, Panaar, Seed Co.), donors (USAID, DFID, EU, SIDA, JICA) and international research centers (IITA, Harvest Plus) and NGO partners working in Eastern Zambia (CRS, Profit+, World Vision, Care International). These findings and recommendations were presented by a team comprised of Geoff Heinrich and James Nguluwe of CRS, and Henry Malwa of SCCI, MAL.

II. CONCEPTUAL FRAMEWORK FOR THE SSSA

This section presents the analytic framework of the SSSA, the seed security framework. Derived from the food security framework, the seed security framework is useful to describe the major parameters of seed security. This chapter includes some illustrations of how a seed system diagnosis can lead to better defined and designed seed system responses.

The Seed Security Framework

The concept of seed security embodies three parameters: seed access, seed availability, and seed quality. Seed security is a function of seed being available, farmers having the means to access that seed, and seed quality being sufficient to promote good production of farmer adapted varieties. These parameters are important for diagnosing crops in a seed system and identifying and categorizing issues that may strengthen or weaken seed security for any given crop.

Table 2.1: Seed Security Framework

Parameter	Seed Security
Availability	Sufficient quantity of seed of adapted crops is within reasonable proximity and in time for critical sowing periods.
Access	People have adequate income, social capital, or other resources to access appropriate seeds.
Quality	Seed is of acceptable quality: • Physiological and sanitary quality. • Farmer adapted / farmer accepted varieties.

Source: Remington *et al.* 2002.

Farm families are seed secure when they can access seed and planting material of sufficient quantity and acceptable quality in relative proximity and in time for planting. Food security and seed security should not be confounded. For example, in some contexts a farm family may have enough seed to sow but lack enough food to eat whereas in other contexts a farm family may have sufficient food but not have access to sufficient seed or planting material at the time of planting or access to seed or planting material of acceptable quality (e.g., severe insect infestation could impact germination or a severe seed born disease might decrease yield).

Acute and Chronic Seed Security

Acute seed insecurity is characterized by distinct short duration events – such as drought, flooding, and insect infestation—and results in large loss of seed . Acute seed insecurity may impact a majority of farmers and actors in a seed system, as in the case of a flood or other natural disaster. Conversely, it may impact only a fraction of farmers and actors in a seed system, as in the case of localized conflict, or hail storm resulting in production loss for some farmers. These examples also illustrate that an acute stress can be characterized by access, availability, or quality constraints.

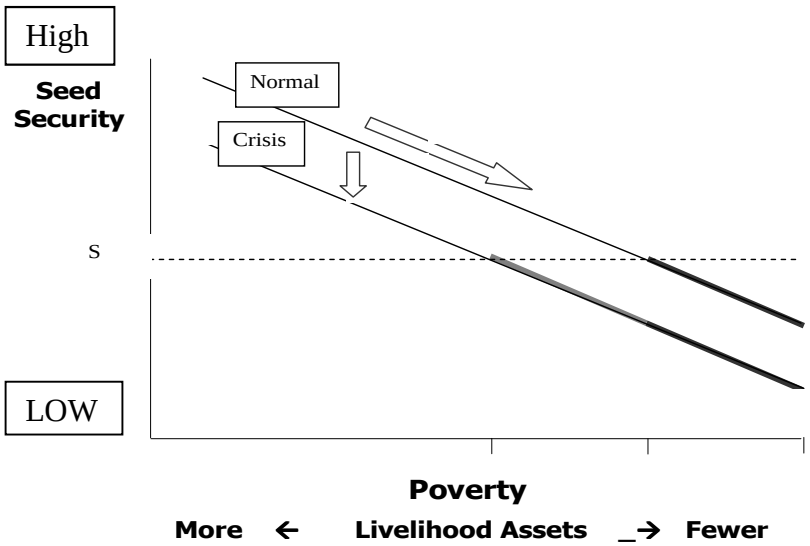
Chronic seed insecurity is characterized as less conspicuous, less evident than acute, and longer term stresses – such as consistent low access to seed at sowing due to insufficient assets (land, labor, capital), insufficient socio-political capital to acquire or access land, or cyclical/repetitive lack of seed availability due to ecological factors (e.g., large storage losses for legume seed). Table 2.2 gives examples of how identification of a specific seed security constraint could be matched with a targeted response.

Table 2.2: Seed System Problems and Appropriate Responses

Parameter	Acute	Chronic
Unavailability of seed	Direct distribution of seed	Happens rarely or never
Farmers lack access to available seed	Vouchers and cash (sometimes with seed fairs)	Income generation activity Agro-enterprise development
Poor seed quality ▪ poor varieties ▪ unhealthy seed	Limited introductions of new varieties	Introduce new varieties and give technical support Variety selection / breeding Development of seed enterprises linked to new varieties and other quality enhancements

Understanding chronic seed insecurity and the effects of an acute event are important. In normal periods, most of a population is seed secure (otherwise they could not remain in farming!). A small portion however, the very poor or vulnerable, may be seed insecure, even in normal times. When an acute stress strikes, two trends can be noted. As harvests overall may decline, the level of seed security for the majority may be lessened. Second, a portion of the population, those already near the margins, may fall into chronic insecurity if the aid responses are not sufficiently forward looking. These trends are illustrated in figure 2.1, and suggest that seed security responses to a crisis may warrant both short-term and longer-tem startegies to addres immedidate as well as chronic problems.

Figure 2.1: The Relationship between Acute and Chronic Seed Insecurity



III. SSSA METHODOLOGY IN EASTERN PROVINCE, ZAMBIA

An SSSA reviews the functioning of seed systems by looking at both formal and informal systems while placing the farmer at the center. Field research for the SSSA 2013 took place in two districts within Eastern Province, Zambia: Chipata and Lundazi. The field research, inclusive of training and on site preliminary analysis of findings and recommendation, took place over a two week period from June 11-25th, 2013. Farmers at the time were completing their maize harvest and storing.

Methods Used

The themes and methods used in the Eastern Zambia SSSA are sketched out in Table 3.1. They include a range of qualitative and quantitative methods and draw on multiple stakeholder insights. Of special note is that the sample sizes were relatively big for a quick assessment: 124 individual farmer interviews, 4 focus group discussions (including women's groups), 8 agro-dealer and 7 seed producer visits and about 15 seed/grain trader interviews. Important background work was also commissioned on formal plant breeding and formal seed sector organization (Chisi, 2013).

Table 3.1: Investigative thrusts and methods used in the Eastern Zambia SSSA.

Type of Investigation	Commentary
Background information collection	• Plant breeding, formal sector seed supply
Database utilization	Use of GoZ databases
Key informant interviews	Crop specialists, Research Scientists Civil Society project personnel,
Focus group discussions (4) Community-based Women's groups	Separate community and women-only FGDs, discussing: • agricultural and variety use and trends • seed source strategies, by crop • women's crop/seed constraints+ opportunities • livelihood/coping strategies
Farmer interviews (N=124)	• seed source patterns/ manure-fertilizer use • seed aid and new variety access
Seed producer groups (N=7)	• history and evolution • marketing trends • opportunities and constraints
Agro-dealer visits (N=8 chains)	• seed types, and other input supplies • business trends; constraints/opportunities
Seed/grain market analysis (N=15 traders)	• crop and variety supplies on the market • sourcing areas and pricing patterns • seed quality management procedures

The Household Sample Frame

Quantitative interviews were conducted at the household level. Households were chosen without bias using the epidemiology approach of fanning out in diverse directions from a central location point and interviewing HH at pre-set intervals. Table 3.2 gives a summary of the characteristics of the HH that were interviewed. Of special note is that over 1/5 were female-headed.

Table 3.2: Eastern Zambia SSSA HH Characteristics (N =124)

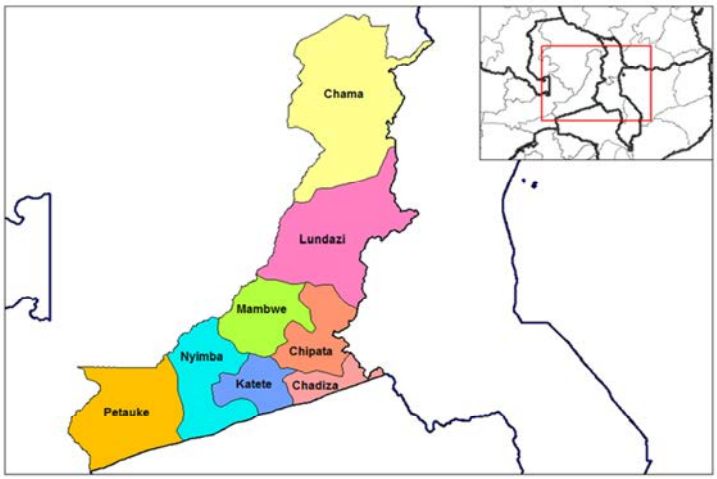
Feature	Description	Sample
Type of HH	Female Headed Adult Headed	**22%** **98%**
HH Size	Mean HH Size Mean Age of head of HH	**5.9 people** **43.8 years**
Area cultivated per HH	Below 1 ha 1-2 ha Over 2 ha	**20.3%** **24.4%** **55.3%**

Source: Eastern Zambia SSSA, HH Data Analysis, June 2013

Site Choice and Characteristics

Assessment sites, locally referred to as 'camps', were chosen to reflect the agro-ecological and socio-ethnic diversity of Eastern Province. Two sites were selected: Katondo for Chipata District and Mwase for Lundazi District. These sites were also selected because the Mawa project, in its start-up phase and managed by CRS and Caritas, identified these sites for their project activities due to reportedly high levels of malnutrition and food security and limited previous interventions. Figure 3.1 shows the location of the districts of Eastern Zambia where the SSSA took place, while Figure 2 gives an indication of the agro-ecological zones. Table 3.3 presents key characteristics of the SSSA sites within each district.

Figure 3.1: Map of Eastern Zambia with SSSA Districts and Sites



Source: Wikipedia Maps, Eastern Zambian Districts

Figure 3.2: Agro-ecological Regions of Zambia

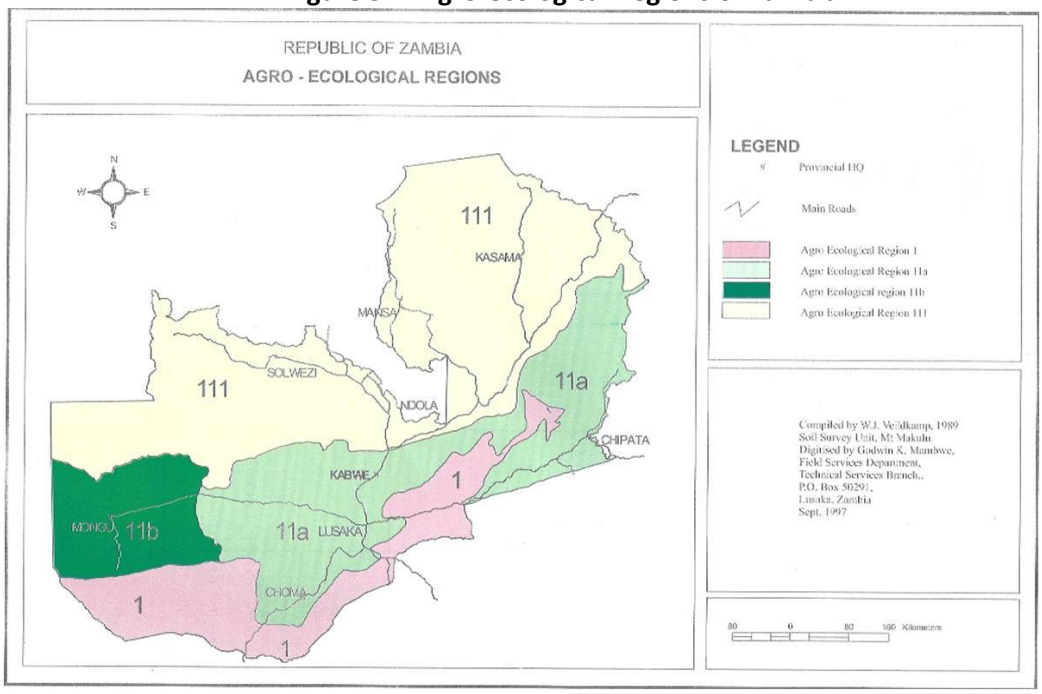


Table 3.3: Key Characteristics of Sites Chosen for the Eastern Zambian SSSA

Site	**Katondo**	**Mwase**
District	Chipata	Lundazi
Agro-ecology	Region II Rainfall 800-1000 MM Plateau	Region II Rainfall 800-1000 MM Plateau, later rains
Irrigated/rainfed	Rainfed	Rainfed and Irrigated
Principal current crops	Maize, Groundnut, Beans, Cotton	Maize, Cotton, Beans, Vegetables / Horticulture, Cassava
Emerging crops	Soybean	Tobacco
Infrastructure -transport -market - elephone -Roads	Gravel road, cell coverage, no agr0o-dealers, informal traders, no electricity, 1 hour by vehicle to nearest commercial center (Chipata town)	2 good gravel roads, cell network, electricity, agro-dealers, 30 minutes by vehicle to Lundazi town and to Malawi border (Jenda town).
Security risks?	None noted.	None noted.
Environmental risks?	Soil erosion, deforestation, (lots of charcoal making), periodic dry spells.	Serious deforestation, erosion, dams burst.
Refugees / IDP?	None	None
Ethnic groups	Ngoni (Nyanja language)	Tumbukra, Chewa, Ngoni.
Other	Densely populated with a village settlement pattern.	Lots of cattle, polygamous, high concentration of Malawians, well-developed,

Source: Eastern Zambia SSSA, SSSA Participant Analysis on June 12, 2013, Chipata Town

IV. POPULATION, POVERTY AND AGRICULTURAL EXPANSION IN EASTERN PROVINCE, ZAMBIA

This section is drawn from a 2013 study led by Indaba Agricultural Policy Research Institute (IAPRI) in Zambia: *Technical Compendium: Descriptive Agricultural Statistics and Analysis for Zambia* (Tembo, S. and Sitko, N. 2013). The study provides some useful contextual background for the districts in which the SSSA was conducted.

Population and Poverty in Eastern Zambia

Eastern Province account for roughly 13% of the total population of Zambia, with 87% of the population residing in rural areas. Populations by District in Eastern Province are shown in table 4.1. Despite significant growth in GDP in recent years, poverty rates remain high. As of 2010, 60.5% of the rural population in Zambia and 78% or the rural population in Eastern Province were living in poverty (Central Statistical Office, Zambia, 2011).

Table 4.1: Population by Province, District and Sex, Rural/Urban, Eastern Province, 2010

Province/District	*Total*	*Male %*	*Female %*	*Rural %*	*Urban %*
Eastern Province	1,525,123	48.8	51.2	87.4	12.6
Chadiza	102,341	49.2	50.8	97.4	2.6
Chipata	436,894	49.0	51.0	74.3	25.7
Katete	234,585	48.8	51.2	91.3	8.7
Lundazi	308,420	48.4	51.6	95.1	4.9
Mambwe	64,672	48.9	51.1	91.3	8.7
Nyimba	81,025	48.9	51.1	91.2	8.8
Petauke	297,186	48.8	51.2	90.4	9.6

Source: 2010 Census of Population. 2013. Central Statistics Office, Lusaka, Zambia.

Eastern Province has above national average poverty levels and above national average stunting rates yet has had significant increases in maize yields and total maize production over the past decade. Between 2000/01 and 2011/12, the total area cropped with maize grew by over 100,000 hectares, maize yields increased from 1.3 MT/ha to 2.0 MT/ha and total maize production more than doubled from 200,000 MT to over 550,000 MT[1].

Within the Eastern Province, HH's surveyed under the 2012 Rural Agricultural and Livelihood Survey, had on average, 2.56 ha[2]of land. Female-headed HH in the same area had an average of 1.70 ha of land.

[1] Crop Forecast Survey, MAL and CSO, 2000-2011. (in: Tembo S. and Sitko N. 2013)
[2] 2012 CSO/MAL/IAPRI Rural Agricultural Livelihoods Survey . (in: Tembo S. and Sitko N. 2013)

Crop Diversity

Crop diversification can be linked to diversified income and nutritional sources, as well as reduced risk—for example, in the case of crop failure and poor market conditions. Simpson's Diversity Index provides a means for measuring household-level crop diversification. It takes into account the proportionate of a household's total area that is dedicated to each crop and ranges from zero to one. As a household becomes more diversified the index moves towards one. Eastern Province has a diversification index of .45. The least diversified district is Nyimba. The most diversified is Lundazi with an index of 0.5[3].

Agricultural Inputs

More productive and efficient agriculture necessitates more intensive and efficient use of agricultural inputs, including farmer knowledge and best practices. According to the Eastern Province zones and HH's surveyed under the 2012 Rural Agricultural and Livelihood Survey, 38% of surveyed households used hybrid maize seeds. The survey reflected HH's using hybrids and not the percentage of area planted allocated to hybrid maize.

Table 4.2: Percent households by crop by seed type, Eastern Province, 2010/11

	local seed	recycled hybrid seed	first generation hybrid seed	open pollinated seed	improved seed	Not stated
Maize	65.9	3.6	38.0	.0	.0	.0
Sunflower	63.4	4.9	30.0	.8	.0	.8
Groundnuts	49.6	2.7	47.5	.2	.0	.0
Soyabeans	64.9	18.8	16.3	.0	.0	.0
Seed cotton	.0	.0	95.3	.0	.0	4.7
Sweet potata-white/yellow	96.7	.0	.0	.0	.0	3.3
Sweet potato-orange	100.0	.0	.0	.0	.0	.0
Other crop	80.7	.0	.8	.0	6.5	13.8
Cassava	34.8	.0	.0	.0	65.2	.0

Source: 2012 CSO/MAL/IAPRI Rural Agricultural Livelihoods Survey

According to the Eastern Province zones and HH's surveyed under the 2012 Rural Agricultural and Livelihood Survey, more than 60% of maize sold in 2011 was to the Food Reserve Agency (FRA) while for other crops small-scale traders were the dominant sales channel.

[3] 2012 CSO/MAL/IAPRI Rural Agricultural Livelihoods Survey

V. SEED SYSTEMS IN ZAMBIA

This section provides background on formal and informal seed systems in Zambia. It is drawn from a paper on the same topic that was prepared for this SSSA by Dr. M. Chisi – a former plant breeder and later Deputy Director of the Zambia Agricultural Research Institute (ZARI) (Chisi, 2013.).

Background

From Independence in 1964 up to 1991, the Zambia seed sector was controlled by the government, with no commercial seed company involvement. This system produced seed of maize and commercial crops, but not seed of many important food crops (though some varieties were released for these latter crops). The market system for seed and fertilizer was liberalized in 1991. This is reflected in the Draft National Seed Policy of 1999 that is currently embedded in the National Agricultural Policy 2004-2015 (see CAP 236, Plant Variety & Seed Act & CAP 233, Plant Pest & Disease Act). These new policies and laws now provide the basis to regulate the seed sector in Zambia.

The Zambian Agricultural Research Institute (ZARI) coordinates soil and crop research in Zambia and conducts crop variety development suitable for different agro-ecologies. ZARI crop varieties and research products are disseminated through public extension and can be accessed by private companies and NGO's for multiplication and sale.

The Seed Control and Certification Institute (SCCI) oversees seed quality management and certification – inspection, testing, and varietal release. SCCI produces foundation seed, provides training on seed production and marketing, and issues seed trade licenses to the private sector for seed production, seed testing, and seed certification. SCCI also encourages decentralized seed production and quality control through the promotion of less stringent standards referred to as Quality Declared Seed (QDS).

The Golden Valley Agricultural Research Trust (GART) is a parastatal organization. It receives public funds but is allowed also to source private funds and gain private benefits, and was created by the Zambian government and Zambian National Farmers Union in 1993. GART is involved in conservation agriculture, livestock development, agriculture for HIV/AIDS mitigation, and has 2600 Ha of research and commercial farms at Chisamba, Central Province. GART is a technical assistance partner under the Mawa project.

The Zambian Seed Traders Association (ZASTA) is a lobbying organization comprised of seven seed companies and University of Zambia School of Agricultural Sciences (UNZA). SCCI is an honorary member of ZASTA.

Breeding and Varietal Release

Zambian Institutions involved in breeding and the introduction of new crops include ZARI, private sector seed companies, GART, and International Agricultural Research Centers (IARCs) which, in Zambia include: International Center for Tropical Agriculture (CIAT), International

Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Institute for Tropical Agriculture (IITA), International Maize and Wheat Improvement Center (CIMMYT), Harvest Plus and the International Potato Center (CIP).

The Southern African Development Community (SADC) has a streamlined process for the release of new varieties - if the variety has already been released in one other SADC Member State then that variety may be exempt from testing in Zambia. It is mainly the commercial crops (hybrid maize, irrigated wheat, soya beans) that have benefitted from this process in to date.

Table 5.2: Key institutions and their Role in Crop Breeding and Variety Introductions in Zambia

Institution	Key Role
ZARI	Breeding; foundation seed production.
Private Seed Companies	Breeding and variety identification; pay for varietal evaluation; prepare data for varietal release committee; seed production and marketing.
SCCI	Chairs Zambian varietal release committee, does foundation seed production, oversees seed inspection / certification.
IARC's	Breeding and variety identification; production of foundation seed for mandate crops:– ICRISAT for g.nut, IITA for cassava, soybean and cowpea, CIAT for common bean, CIP for sweet potato.

ZARI Research Stations have well defined remits for breeding:

- Msekera Research Station for Legume (near Chipata, Eastern Province)
- Chisamba Research Station for Maize (near Lusaka, Central Province)
- Solwezi Research Station for Roots &Tubers (near Solwezi, Northwestern Province).

The purpose of the variety release system is to ensure that varieties made available to farmers are superior in their performance and more diverse in their characteristics than existing varieties on the market, to prevent the use of varieties that might have a negative impact on agriculture (such as those susceptible to major disease), and to facilitate determination of variety ownership. Variety release procedures for Zambia are stipulated under the Plant Variety and Seeds Act (CAP 236 of the laws of Zambia): any variety sold to farmers should undergo formal release procedures.

Three major activities are involved in variety release procedures:

1. Assessing the variety for Distinctness, Uniformity and Stability (DUS) over two growing seasons. The DUS test is basically done for the purposes of variety identification and ownership.
2. Value for Cultivation and Use (VCU)is done to ensure that only high yielding and superior varieties are allowed to be marketed in Zambia.
3. Decision making by the Variety Release Committee of Zambia, representing interest groups within the agricultural sector such as ZASTA and ZNFU. SCCI serves as the secretariat.

Seed production is carried out in the three stages (Breeders, Foundation and Certified seed) depending on the class of seed. Producer registration, field inspection, and certification are

undertaken by the SCCI. In principle, breeder seed is produced from breeder parent material under the control of SCCI. Foundation seed is produced from breeder seed under supervision of SCCI and made available to registered seed producers. Certified seed is produced from foundation seed and is certified by SCCI before being made available to the public.

Table 5.3: Summary of varieties officially released in Zambia

Crop	Total Varieties	First and Last Year of Varietal Release
Maize	+210	1984-2011
Sorghum	18	1970-2012
Pearl Millet	11	1970-2012
Finger Millet	7	1970-2009
Soya bean	36	1973-2012
Cow Pea	6	1984-2011
Common bean	28	1970-2011
Paddy Rice	15	1969-2012
Upland rice	2	2009
Groundnut	16	1954-2008
Cassava	7	1993-2001
Sweet Potato	8	1993-2003
Pigeon pea	2	2001
Sunflower	30	1971-2012

Source: SCCI Official Variety Register (2012)

This table illustrates that there is an opportunity to expand crop improvement efforts for food crops as Zambia is an agro-ecologically diverse country. Remarkable also is the number of maize varieties developed in the last 30 years (over 200!). Greater efforts towards other crops might well be warranted.

Certification and Quality Declared Seed

Relevant laws which guide Zambian government seed policy include: the Plant Variety and Seeds Act (CAP 236), the Plant Pests and Disease Act (CAP 233), Cotton Act (CAP 227), the Noxious Weeds Act (Cap 343), and the Plant Breeders Rights Act No. 18 of 2007. The draft National Seed Policy (1999) is part of the National Agricultural Policy of 2004.

The overall objective of the 1999 draft national seed policy was to ensure that sufficient quantities of quality seed of various crops can be made available to farmers in an efficient and convenient manner with a view to increasing crop productivity. The draft seed policy aimed to streamline and enhance germ-plasm development, variety evaluation, release, registration and maintenance activities and to integrate formal and informal seed systems.

SCCI undertakes the functions of seed quality and certification which include seed testing, seed inspection, variety testing and release. Other functions are seed training, development of the informal seed sector, seed trade control and co-ordination of the seed industry.

To reduce the financial and physical limitations in implementing comprehensive seed quality control activities, the government has allowed an additional class of seed that meets

minimum quality standards and is considered easier to enforce. This class is called Quality Declared Seed (QDS) and, in general , is restricted to officially released varieties for multiplication. Out-grower seed crops are assessed following a QDS standard.

Seed Sourcing from Formal and Informal Channels

The Zambia seed system can be broadly described as having distinct formal and informal production and supply channels, though the QDS standards may bridge these two to some extent. This informal or farmer based system is estimated to cover 80-90% of farmer seed needs for most crops. When well supported and linked to sources of improved varieties, the informal seed sector can be a reliable and efficient way for smallholder farmers to access improved varieties of crops whose seeds attract a very limited interest of commercial seed sector (Wekunda 2012). On-farm growing and maintenance of locally-adapted landraces, cultivars and wild species help the farmer decrease the impact of a series of production constraints like drought, flooding, heat, cold, pests and diseases.

The Zambian formal seed system is comprised of the public sector (ZARI, SCCI, Department of Agriculture, and other research institutions involved in agricultural research like UNZA and GART) and the private seed companies, seed traders, and the Zambian Seed Traders Association (ZASTA). While private commercial seed distribution networks are well developed, especially along the railroad line, there are very few agro – dealers in rural areas, making it difficult for farmers to access agro-inputs. Heinrich et al. (2010) observed that despite farmers having knowledge of the benefits of growing improved varieties, many could not afford to purchase the improved seed and resorted to planting recycled seed, especially for groundnuts and other important legume crops.

The role of NGOs can be important in filling the gaps left by the formal seed sector, particularly in outlying areas where seed companies have found the seed business unattractive, and with crops that do not attract strong commercial interest (e.g., sorghum, pearl millet, cowpeas and open pollinated varieties of maize) but which are vital for meeting crop diversification concerns and household food security. There are many seed programs run by NGOs and research organizations in rural areas of Zambia which support activities such as variety demonstrations, training on seed production and marketing, promotion of seed loan schemes, direct seed distribution, and voucher programs. Many of these projects support community based seed production for legumes and vegetatively-propagated crops.

Government Subsidized Farmer Input Support Program (FISP)

After independence in 1964 and until 1991, Zambia had controlled markets for seed and fertilizer. Throughout the 1970's and 1980's, maize yields increased, as did the rate at which farmers accessed and used seed of improved maize varieties. With structural adjustment and the reorientation to market liberalization, agricultural input subsidies were reduced through the 1990's. The use of hybrid maize seed and fertilizer declined, as did maize yields. From 2002 onwards, the government of Zambia re-established seed and fertilizer subsidies through the Farmer Input Support Program (FISP). The stated goal of this program has been to improve access for small scale farmers to inputs while enhancing the participation and competitiveness of the private sector.

Fertilizer and maize seed have been distributed through the FISP. The subsidy rate rose to 80% in 2008-2009, with farmers expected to pay 20% of the input cost. During 2009-2010, the size of the average package per farmer was reduced in order to reach a larger number of farmers. The FISP operates by selecting private suppliers through a tender process. Local transporters distribute inputs to designated collection points, and selected cooperatives and other farmer organizations issue inputs to approved farmers and pay a portion of the costs at participating banks or financial institutions.

Table 5.4: Zambia Farmer Input Support Program – Level and Quantity of Maize and Fertilizer – 2002/3- 2010/11

Year	% Subsidy level for seed and fertilizer	Quantity of subsidized Hybrid Maize Seed (MT)	Quantity of subsidized fertilizer (MT)
2002-2003	50	2,400	48,000
2003-2004	50	3,000	60,000
2004-2005	50	2,500	46,000
2005-2006	50	2,500	50,000
2006-2007	60	4,234	84,000
2007-2008	60	2,550	50,000
2008-2009	75 (50% for seed)	4,000	80,000
2009-2010	75 (50% for seed)	5,342	100,000
2010-2011	75 (50% for seed)	8,790	178,000

Source: Mason and Ricker-Gilbert 2011, original data from MACO

VI. ASSESSMENT FINDINGS

The fieldwork for the SSSA took place in June 2013 shortly after the main season harvesting and storage.

The assessment considered two major themes. It analyzed the short-term, acute seed security situation, focusing on the 2012-13 main season (extending November 2012-May 2013) and the 2013-2014 main season (again extending November to May). Seed procurement strategies, quantities sown, and crop profiles were all analyzed. As the second thrust, the SSSA considered medium-term trends, including possible chronic seed security problems and emerging opportunities. Issues considered included: seed sourcing strategy; crop diversification and agricultural product transformation, seed production, access to modern varieties, use of other inputs and seed aid received.

This section presents field findings on seed security across the two assessment sites in Chipata and Lundazi Districts. For site-by-site information, see the tailored action plans appended in Annex I.

Acute Seed Security Findings, 2012-2013 and 2013-2014

Issues of seed security were first scrutinized for the short term: how and where did farmers obtain seed for the main 2012- 2013 season? Did they plant a 'normal' quantity of planting material? What do they assess as their seed security strategy and prospects for the 2013-2014 season? Note that seed system stability and resilience are best assessed by looking at multiple seasons in a row.

Seed sources and quantities planted, 2012-13 main season

Table 6.1 shows the sources and quantities of seed actually planted by farmers for the 2012-2013 main season.

Overall, about 60% of the seed farmers sowed came from local channels, principally from farmers' own stocks or through social networks of neighbours, friends and relatives. This suggests the importance of informal seed systems as the core seed sources.

A closer look reveals that farmers' own stocks, that is own-saved seed, was particularly important for maize, groundnut, sunflower and the small amount of millet sown.

Neighbours, friends and relatives were especially important as seed sources for groundnut, sunflower soybean and cowpea.

The Government, through its Farm Input Supply Program (FISP) proved a key source for maize seed, but for no other crop grown. Farmers surveyed reported that the government as a seed source accounted for nearly 1/3 of all maize seed sown 2012-13.

Contract seed growers were important for almost of the cotton seed grown (97%).

In terms of commercial markets, well–established agro-dealer networks were mainly important for sunflower and soybeans. Of note is that such agro-dealers were *not a major source for maize, as independent from FISP.*

Interestingly, farmer seed producers did not figure in the tally at all for seed of major crops. Similarly, local market purchase was minimal (only 3% of seed sown). These very modest trends may be linked to the focus on only the 'three major crops'. A wider palette of crops, including grain legumes, would likely have highlighted both these seed sources to a greater degree.

Finally, just the brute numbers of kgs sown show the dominance of a very small triad of crops: maize groundnut and cotton—which accounted for 95% of the seed sown. This lack of crop diversification is especially disturbing given that the zone is drought-prone zone and that populations suffer from high rates of mal-and under-nutrition. **(**This of lack of crop diversification is centrally addressed in in the section on "Chronic Stress and Emerging Opportunities.)

Table 6.1: Seed (%) planted and sources farmers used, 2012-13 across the Chipata and Lundazi sites.

Crop	Total kg sowed	% of total								
		Home saved	Carryover - maize hybrids	friends, neighbours , relatives	local market	agro-dealer	Gov't	NGO / FAO	contract seed growers	Other
Maize	2985.0	**50.6**	0.7	6.9	0.2	7.9	**32.0**	0.7	0.0	1.2
Millets	0.5	**100.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Groundnut	2209.5	**60.5**	0.0	29.7	6.3	0.0	0.5	0.0	0.2	2.9
Common beans	25.0	0.0	0.0	0.0	**100.0**	0.0	0.0	0.0	0.0	0.0
Cowpea	3.0	0.0	0.0	**100.0**	0.0	0.0	0.0	0.0	0.0	0.0
Sunflower	170.5	**40.8**	2.9	24.0	0.0	26.4	0.0	5.9	0.0	0.0
Cotton	1344.5	0.0	0.4	0.7	0.1	1.1	0.0	0.0	**97.6**	0.0
Soya Beans	141.5	1.1	0.0	**35.3**	24.7	**35.3**	0.0	3.5	0.0	0.0
TOTAL-all crops	6879.5	**42.4**	0.4	14.0	3.0	5.0	14.0	0.5	19.1	1.5

Are farmers seed-stressed 2012-13? : (Are the amounts of seed sown in this main season more or the same as usual? What about the yields)

To understand better any possible vulnerability, the SSSA team asked farmers to compare the 2012-13 quantities of seed they sowed, by crop, with what they would normally sow during the same period each year. Basically, the question was this: Were the 2012-13 patterns 'normal' or 'different' from what farmers usually do, as gauged by the farmers themselves?

Farmers reported that they, overall, they were increasing seed quantities sown (with figures showing a modest increase of about 7%) (Table 6.2). While this indicates important

production stability, of particular interest are the ways that farmers have been shifting crop profiles, increasing their emphasis on sunflower and decreasing rates of cotton cultivation. (NB. The soybean sample is too small to draw conclusions).

The crop yield and general harvests were reported by farmer also as average or good [(about 80% of cases cross crops (Table 6.3)]. So, even in terms of yields, **2012-13 was a relatively stable season.**

Table 6.2: Farmers' sowing amounts for 2012-13- more, less or same?

Crop	Number of HHs	% of HHs			Change sowing quantites for all growing the crop
		MORE	SAME	LESS	average % change
Maize	123	30.1	37.4	32.5	**9.79**
Groundnut	107	26.2	29.0	44.9	**6.91**
Sunflower	28	53.6	32.1	14.3	**59.09**
Cotton	80	6.3	60.0	33.8	***-13.72***
Soya Beans	15	66.7	20.0	13.3	***-19.17***
TOTAL-all crops	**358**	**27.1**	**38.5**	**34.4**	**6.67**

Table 6.3: Farmers' assessment of yield by crop, 2012-13

Key Crop		How was yield?					
		N			%		
	N total	Good	Average	Poor	Good	Average	Poor
Maize	184	51	94	39	27.7%	51.1%	**21.2%**
Groundnut	123	39	53	31	31.7%	43.1%	**25.2%**
Sunflower	32	17	10	5	53.1%	31.3%	15.6%
Cotton	82	24	42	16	29.3%	51.2%	19.5%
Soya Beans	16	7	5	4	43.8%	31.3%	**25.0%**
TOTAL-all crops	**442**	**141**	**206**	**95**	**31.9%**	**46.6%**	**21.5%**

Seed sources and quantities to be planted 2013-14 Main season ('next season')—and possible stress

Farmers in the two sites were also asked about seed sources and quantities to be planted for the next season, 2013-14. While 'planned seed sources' are not proven 'hard' data, they are a good indicator of whether farmers expect seed stress or other related troubles. Further, as many of the interviews were conducted by aid providers, farmers answering this question could have shown bias by trying to elicit seed aid help. The **results below show a strong positive trend : farmers intend to increase sowng amounts by 63% for the 2013-14 period! Greater emphasis on sunflower and sowbean is of particular note. Cotton is the only key crop NOT being intensified in terms of seed use.**

Table 6.4: Farmers' sowing amounts for 2013-14- more, less or same?

Crop	Number of HHs	% of HHs			Change sowing quantities for all growing the crop
		MORE	SAME	LESS	average % change
Maize	122	54.1	30.3	15.6	**45.2**
Groundnut	108	43.5	42.6	13.9	**44.9**
Sunflower	40	70.0	22.5	5.0	**199.5**
Cotton	46	13.0	76.1	8.7	**3.0**
Soybeans	39	76.9	15.4	7.7	**134.0**
TOTAL-all crops	**364**	**49.5**	**37.6**	**12.4**	**63.5**

In short, trends show little sign of acute stress – especially as farmers plan to sow considerably more than normal in the coming 2013-14 season. There are indications that sunflower, in particular, is being intensified, as well as soybeans. In contrast, fewer farmers are planning to sow cotton – and there are few plans for changing sowing amounts among those who will sow cotton.

Focusing on potential problem areas for farmers + reasons spurring production

Potential problem areas

The relatively 'normal' and even promising picture for the 2012-14 period should not obscure that there may be vulnerable populations, or other key factors, which can give insight into why farmers are planting less---- factors would could influence design of critical assistance. In terms of household numbers, about 1/3 were planting less of a given crop for the main 2012-13 and 1/10 of households for the 2013-14 season.

Many and diverse reasons were given for this decline in seed use (Table 6.5). As examples: " I had no money to buy more seed' or ' I have no husband to help with the labor" , or ' the rains came too late'. ' Lack of well developed markets to sell produce' was the fourth driving factor for sowing less (no *markets!*). '**Access' was the only seed –related constraint (**i.e. seed availability was not a cited as a key problem'**.** Lack of cash affects sowing rates for purchased seed such as soybean, sunflower, r common beans . **The other key factors associated with declining seed use were linked to the general vulnerability of households** (labor, health, poor weather, or constraints to land) and **to lack of incentives due to poor market development.**

Table 6.5: Reasons farmers gave for planting LESS than normal for most recent and upcoming growing seasons (% of responses).

Reasons	2012-13	2013-14
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
No seed available in market	3.3	6.7
No seed/cuttings available from neighbors	2.4	0
Seed access		
No money to buy seed/poor finances or seed too high	26.8	**37.8**
Seed quality		
Seed available is not good quality or the variety is not liked	0	2.2
Sub-total: seed-related	**32.5**	**46.7**
NON-SEED FACTORS OF PRODUCTION (limits)		
No/insufficient labor	13.8	8.9
Illness/health problems	6.5	4.4
No/insufficient land or land not appropriate/sufficiently fertile	8.9	15.6
Lack of tools/tractor/ other machinery to farm	0.8	2.2.
Plant pests/diseases make production not possible	0	0
Animals/predator make production not possible	0	0
Lack of other inputs: controlled water supply/irrigation or fertilizer	6.5	2.2
Poor weather/rainfall	14.6	2.2
Insecurity (e.g. theft)	1.6	2.2
Sub-total: Factors of Production	**52.8**	**37.8**
OTHER PRIORITIES/STRATEGIES		
Markets for crop or crop products not well-developed	9.8	8.9
Other priorities than agriculture (e.g. have shop)	0.8	0
Changing Crop priorities or changing agricultural practices	0	0
Other	3.3	6.7
TOTAL	**99.2**	**100**

Spurring production

To complete insights into farmers' planting decisions, we end on a positive note: why those who planted more for a given crop did so (Table 6.6). **Most of those increasing sowing amounts were making strategic decisions,: they were either placing more emphasis on farming (or on particular crops) or responding to new market opportunities**. Even in this high stress zone, markets prove to be a driving force in smallholder farmers' decision-making.

Table 6.6: Reasons farmers gave for planting MORE than normal for most recent and upcoming seasons (% of responses).

Reasons	2012-13	2013-14
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
More seed available due to good harvest	4.1	6.1
More seed available due to free seed	3.1	1.1
Seed access		
More money to buy seed or seed price low	5.2	3.3
Got credit to buy seed	0	0
Seed quality		
Have especially good seed or good variety	2.1	2.8
Sub-total: seed-related	**14.4**	**13.3**
NON-SEED FACTORS OF PRODUCTION (opportunities)		
Good/increased labor	2.1	4.4
Feeling strong/healthy	0	1.1
Have more land/more fertile land	6.2	2.8
Have tools/tractor, other machinery to help farm	0	0
Have access to irrigation, fertilizer or other inputs (for example, stakes)	1	0.6
Good weather/rainfall	1	0
Good security (peace has arrived; less theft)	0	0
Sub-total: Factors of Production	**10.3**	**8.9**
OTHER PRIORITIES/STRATEGIES		
Well-developed /new markets for crop or crop products	19.6	32.8
Have decided to give more priority to agriculture	42.3	36.1
Changed crop profiles or priority to certain crops	0	0
Other	12.4	7.2
TOTAL	**99**	**98.3**

The supply side: Can markets deliver 2013-14?

We now briefly turn to the supply side of seed. For 2012 to 2013, formal agro-dealer markets provided only about 5% of the seed sown across crops and were used especially for sunflower and soybean seed. Local markets (the seed/grain markets) provided overall only 3% of the seed sown, and were used especially for the legume--: beans, soybean, groundnut--and sunflower. So, in terms of quantity, market purchase is modest overall but key for the legumes and for the crops in which farmers are increasingly investing : soybean and sunflower. Can these markets function sufficiently to meet 2013-14 demand? We focus

here only on the formal seed sector supply. (For local market seed, the borders with Malawi are especially fluid for common beans, and to a smaller extent, for cowpea and soybeans).

Agro-dealer and formal seed supply 2012-14

The SSSA team interviewed agro-dealers and formal seed sector companies at both sites of the assessment (see Box 1 below).

What there was more of: Essentially agro-dealers visited had stocks of hybrid maize and fertilizer, with some also selling vegetable seed packets. Many maize hybrids were on offer (perhaps more varieties than are needed, and serving as a source of confusion for farmers). The team saw no OPVs on offer. A good percentage of the agro-dealers also had supplies of agrochemicals, especially herbicides, insecticides, and pesticides.

What there was less of: Sunflower, soybean and groundnut seed overall was more difficult to find, although such legume seed was available if searched for explicitly. Only certified seed of groundnut, in particular, was noted as an overall lack, especially by farmer seed producer groups. The major complaint around retail legume seed sale focused on pack size. Generally, legumes were packed in bags of 5 kgs and upwards (10,15,25 kg bags) which are units much larger than a farmer would need, if he/she is seeking new varieties, rather than certified seed per se. One concern is that the demand for certified seed of non-maize crops is not well understood. Several agro-dealers recommended some awareness raising efforts in this area.

(Note that any lack of seed per se was noted mainly at the basic seed level, that is the base seed needed to move toward certified seed multiplication. **Groundnut seed here is signaled as a known priority—for certified and basic seed.)**

Overall in terms of seed supply, the SSSA found that maize see was 'more than available' (although the team saw no OPVs) and legume seed on offer seem to be able to serve the (poorly-understood) current demand.

Agro-dealer: problem areas

Agro-dealers themselves highlighted several issues:

- Counterfeit seed product is a common threat—for maize.
- There were also some complaints about 'foreign' importers bringing in chemical products in bulk and then informally re-packaging them and selling in retail outlets.
- Important quantities of FISP inputs flood the open market and are said to affect the rate at which fertilizer and maize is sold.
- There is currently no network among agro-dealers to reinforce better business practices. Some association meetings occasionally take place in the Lundazi region but seem lacking all together in Chipata District.

Box 1: Agro-Dealers Interviewed During Eastern Zambian SSSA				
Agro-Dealer	*Core-business*	*Indication of Business Volume*	*Threats*	*Opportunities*
Zamseed Chipata	Chipta. Hyrbid maize –90% of all seed volumes - over 200 retail outlets in Eastern Province	150 tons of maize sold in 2012/2013	Smuggled seed from Malawi, and re-packaged fake seed.	More stockists / outlets with project level support & subsidies. Cracking down on illegal seed trade.
Kumawa Agri-Shop	Chipata. Hybrid maize -65% of seed volume – and g nut, soybean, beans for 35% - close to a dozen outlets/ stockists in Eastern Province	23 ton of maize sold in 2012/2013	Drought – farmers do not know what seed can provide with low rainfall. Agro-dealers trading in smuggled seed.	Sales to NGO's
MSP Farmer Shop	Chipata. All agro-inputs: seed, fertilizer, herbicide & pesticide, tools, animal feed, vet products – 3 shops in Eastern Province.	18 tons of maize and 50 tons of fertilizers sold in 2012/2013	High transportation costs, drought.	More sensitization through demo plots, use of radio to advertise.
Chimwemwe & Sisters	Lundazi, Munyukwa. Rural agro-dealer, single sales point. Main product maize, soya bean, fertilizer and pesticides.	1 ton of maize sold in 2012/2013	Farmers are not aware fo the value of certified seed and don't have money to buy seed. No access to capital to expand the business.	Agro-chemicals, awareness raising on the benefit of certified seed through demo plots.
Sheni Agro-Suppliers	Main shop in Chipata and retailing seed (mostly maize), fertilizer and chemicals through rural stockists, farmer cooperatives, and individual farmers.	50 tons of maize sold in 2012/2013 and 350 tons of fertilizer and 3,000 liters of agro-chemical.	Illegal / smuggled seed and chemicals from Malawi. Resale of FISP acquired seed and fertilizer.	To establish a seed network among agro-dealers to reduce smuggled / counterfeit products. Government support to control smuggles products.
K & M Enterprise	Mwase town, between Lundazi town and the Malawi border. Sole outlet reselling certified seed, fertilizer, and pesticide and herbicides.	4 tons of maize and 2 tons of sunflower seed and 7 tons of fertilizer sold in 2012/2013 season.	Inability to procure agro-inputs on time from suppliers. Limited access to capital. High transport costs.	To become an official agent for the government under FISP. Support and subsidies to farmers so they can purchase inputs.
Chisomo Agro-Chemical	Jenda town, Malawi-Zambian border.	Cypermethrine 5,000 liters sold and Cicorin 3,000 liters sold in 2012/2013.	No uniform pricing, lots of cheap / fake chemicals on the market.	Lower prices on legitimate products to raise demand, control the cheap illegal imports.
Lundazi Agri-Coop	Lundazi, no outlets. All agro-inputs but mostly maize.	7 tons of maize seed sold in 2012/2013	High competition with close to 40 other dealer in and around town. No contract with the Concervation Farming Unit (CFU)	Colloboration with other agro-dealers to purchase inputs together. Advertise on radio.
Saju Agro-Dealer	Jenda town, Malawi-Zambian border. They have a second branch at Kanungu. All agro-inputs.	Fertlizer and vegetable seed were fastest moving products / no volumes provided.	High competition from dozens of other agro-dealers shops in Jenda. Price changes due to currency fluctuation and changes in subsidies on agricultural inputs.	Agro-dealer training programs. Packing inputs in small packs. Being able to participate in voucher programs aimed to help farmers access inputs.
Small Farmer Fertlizer Revolving Fund	Jenda town, Malawi-Zambian border. Sole outlet, main shop is in Mzuzu. All agro-inputs but mainly maize.	2o tons of maize seed sold in 2012/2013.	Higher transport costs. Currency fluctuation. High competition from other agro-dealers.	Selling to both Zambia and Malawia.

Source: SSSA Eastern Zambia, June 2013

Market seed access/price

In addition to availability of supply, seed price and subsequent farmer access were reviewed. In Table 6.5, a quarter to a third of those sowing less of a given crop cited 'money' as the limiting factor. Below, we have calculated the expenses for farmers for 2012-13 seed purchase and projected for 2013-14 based on amounts sown and current market prices. Table 6.7 shows prices for those focusing on the standard three major crops, that is maize, groundnut and cotton (the last being 'loaned' to contract farmers). Table 6.8, goes through the same tabulation process but focuses on the scenario where farmers are starting to move to crops alternative to cotton, here with an example of soybean substitution.

Farmers' expenditures for seed seem relatively modest. For the routine crops cluster: Kwacha 38.7 ($US 7) for 2012-13 and Kwacha 73 (or $US 13.30 for 2013-14). The switch to soybean does result in a significantly heightened investment, 84 and 106 Kwacha for 2012-13 and 2013-14 respectively (or the equivalent of $US 15.27 to 19.25). Hence, for the 'routine crops', most farmers can likely meet the needed seed costs (recognizing that the very poorest may always be cash-stretched). However, the move to soybeans represents a much bigger investment in seed. Certainly, fewer farmers will be able to move toward this market-oriented opportunity.

Table 6.7: Eastern Zambia farmers' cash needs for seed purchase (Kw) 2012-14 routine crops.

most important crops	N growing this crop	**Spending 2012-13***			
		local market	input shops	market + shops	% of total
maize	123	0.5	23.9	**24.4**	**63.0%**
ground nut	107	14.3	0.0	**14.3**	**37.0%**
cotton	80	0.0	0.0	**0.0**	**0.0%**
total (of 3)		**14.8**	**23.9**	**38.7**	**100.0%**

2013-14: 73.1 Kw or $ US 13.30

* Kwacha. Approx 5.5 ZMW / US$ ($ US 7)

Table 6.8: Eastern Zambia farmers' cash needs for seed purchase (Kw) 2012-14 – scenario of those subsitituting soybean for cotton.

most important crops	N growing this crop	**Spending 2012-13***			
		local market	input shops	market + shops	% of total
maize	123	0.5	23.9	**24.4**	**63.0%**
ground nut	107	14.3	0.0	**14.3**	**37.0%**
soybean	15	18.7	26.7	**45.3**	**0.0%**
total (of 3)		**33.4**	**23.9**	**84.0**	**100.0%**

2013-14: 105.9 Kw or $ US 19.25

* Kwacha. Approx 5.5 ZMW / US$
$15.27

Community assessment of seed security

Finally, as a cross-check to the above quantitative data, the communities themselves were asked to assess the seed security of their members. Seed Security was defined as either having the seed already in hand or being able to access the seed with some certainty (through purchase, barter, gift, or other). Community meetings at both sites involved upwards of 40 people, men and women, and the discussions were intense and interactive. Table 6.9 presents the community of Chipata's own assessment of those in their area who they deemed seed secure for the upcoming season, 2013-14. For all crops cited, communities sensed their members had seed or could get seed: i.e. 100% would be seed secure.

Table 6.9. Chipata Community assessment of % of its members who are seed secure for 2013-14 .

Crop	% Seed secure
Maize	100 ('Maize is survival for us')
Cotton	100 ('availability not a problem')
Groundnuts	100
Sweet Potato	100

This positive assessment does not mean that the community in Chipata felt achieving such security was easy. In particular, sweet potato vines were not always seen as easy to access in the quantities needed. Also, getting large quantities of certified groundnut seed was seen as an obstacle—especially as many aimed to expand groundnut and decrease surfaces to cotton. Storage losses and constraints to marketing were also cited as key impediments and are discussed further in the next section—on chronic stresses.

Summary: Acute Seed Security Findings: 2012-2014

1. This assessment revealed no significant acute seed security stress as evidenced by an overall increase in in sowing rates for the 2012-13 season of 7% and a projected increase in sowing rates of 63% for the 2013-14 season.

2. Among the minority of households indicating a reduction in sowing amounts in the 2012-13 and 2013-14 seasons, lack of money was the driving constraint. Lack of cash particularly affects sowing rates for purchased seed such as soybean, sunflower, or common beans. The other key factors associated with declining seed use were linked to the general vulnerability of households (labor, health, poor weather, or constraints to land) and to lack of incentives due to poor market development.

3. A very small cluster of crops dominates production food production in the Eastern Province, Zambia. On a kilogram basis, seed of maize, groundnut and cotton accounted for 95% of the seed sown. This lack of crop diversification is especially disturbing given that the zone is drought-prone zone and that populations suffer from high rates of mal-and under-nutrition.

4. Seed sourcing channels vary by crop but are not diverse. The government, through FISP (Farm Input Supply Program), is a key source for maize seed with farmers

reporting that the government as a seed source accounted for nearly 1/3 of all maize seed sown 2012-13 (with only 8% coming from agro-dealers directly).

5. Farmers are changing crop profiles in important ways—shifting out of cotton and investing more in sunflower and soybean.

6. There are some supply-side concerns for legumes and especially for groundnuts. The demand for groundnut seed is growing as farmers projected an increase in kgs of groundnut sown by 45% for the 2013-14 planting season. There are challenges accessing good quality groundnut seed (possibly linked to shortages in basic seed production). There are also post-harvest handling concerns as reflected by high levels of aflatoxin (see *Chronic stress section*).

7. Overall expenses for seed purchase seem relatively modest and affordable for most. For the routine crops cluster of maize, groundnut and cotton, costs are: Kwacha 38.7 ($US 7) for 2012-13 and Kwacha 73 (or $US 13.30) for 2013-14.

8. The switch to soybean does result in a significantly heightened investment, 84 and 106 Kwacha for 2012-13 and 2013-14 respectively (or the equivalent of $US 15.27 to 19.25). Hence, for the 'routine crops', most farmers can likely meet the needed seed costs (recognizing that the very poorest may always be cash-stretched). However, the move to soybeans represents a much bigger investment in seed.

9. Overall, the communities themselves deemed their members as seed secure for the 2013-14 season.

Hence, the 2012-13 season was a stable if not promising one. There are some seed system stresses, but these seem to be chronic ones rather short-term constraints.

Chronic seed system concerns+ emerging opportunities

We now move to examining more systemic trends in eastern Zambia agriculture and seed security. Community-level assessments were done in both sites and involved a range of methods: community meetings, special focus group discussions with women, key informant interviews (with government leaders, business men, NGOs staff and others), and market analyses. The varied methods allowed for cross-verification and opened possibilities to assess medium-term trends. The following topics are highlighted below: dynamism in use of seed sources, crop diversification, decentralized seed production, access to new varieties and non-seed input use. A final section assesses if any of these features differed according to gender of the household head or size of the cultivated land area.

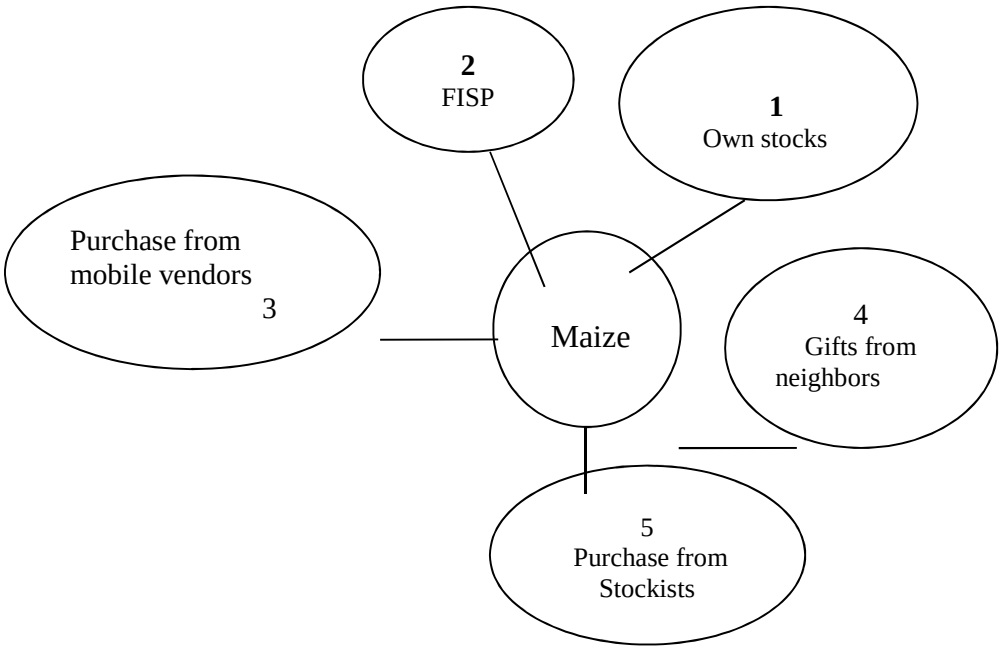
Seed system sourcing-- dynamic trends

Community mapping of seed sources served to trace general trends in seed source strategy. Groups mapped seed sources for a particular crop and compared current sources with those used five years previous. Seed source trends are mapped for the community of Mushawa in Chipata: for three crops: maize, groundnut and sweet potato.

Figure 6.1 shows the key seed sources for maize. In terms of current sources, own stocks and seed from the government program, FISP figure as the first and second most important sources. Seed from mobile vendors, gifts from neighbors and seed from stockists also are notes, as secondary outlets for seed (with stockists in last place). The main difference in 2013 seed sources and those remarked from 2008, five years ago, is the emergence of mobile vendors. According to the community, these vendors have seized on an important opportunity. When government distributions are late: mobile vendors step in to fill the gap.

Figure 6.1 Chipata Mushawa maize seed sources

2013



2008

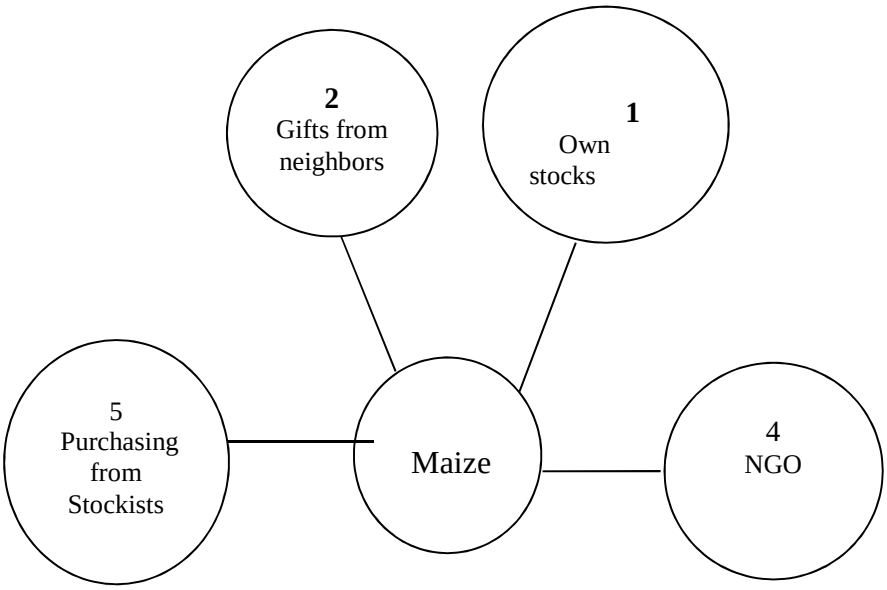
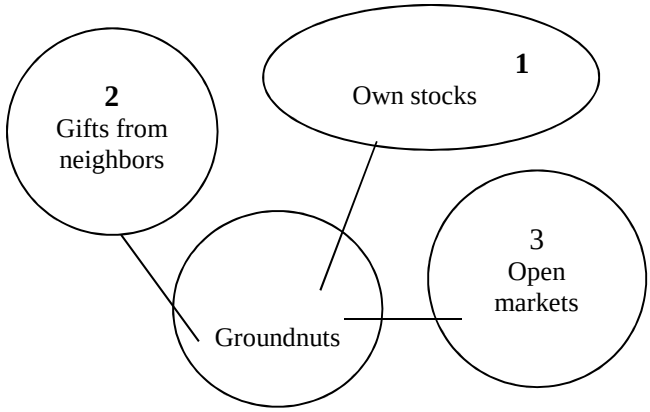


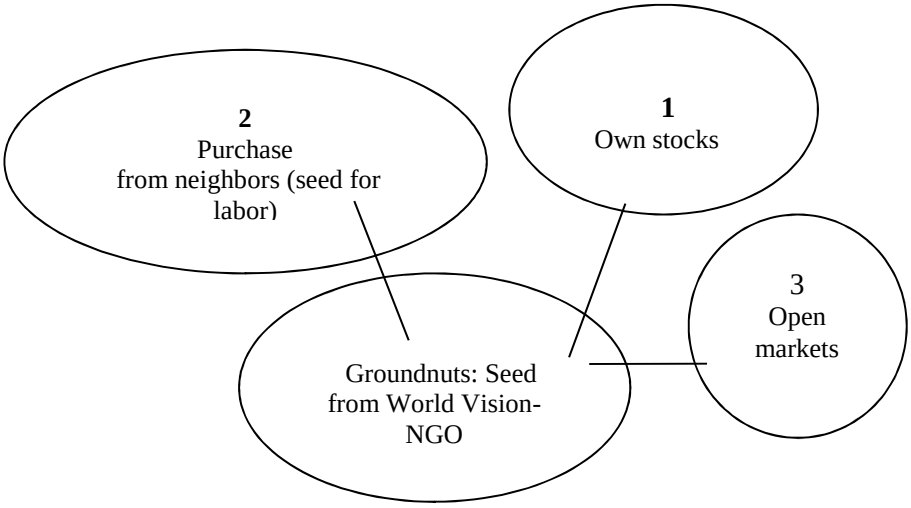
Figure 6.2 assesses possible changes in seed sources for groundnut. Stresses remain in that there is often a scramble to find enough good groundnut seed. Own stocks, neighbors (seed for labor), and open market remain the key sources through the years. The community noted some important help five years ago with an NGO (World Vision) that also provided some new varieties. Unfortunately, the NGO aid withdrew and there are no sustainable channels for now getting new groundnut types.

Figure 6.1 Chipata Mushawa groundnut seed sources

2013



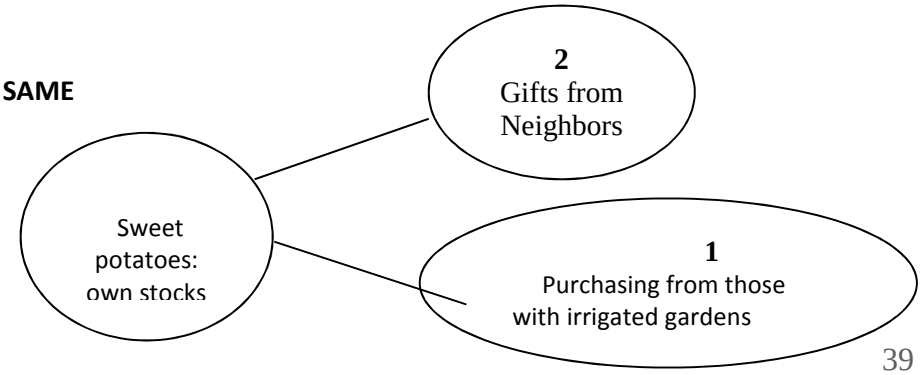
2008



Finally figure 6.3 diagrams sources for sweet potato planting material. It is hard to obtain now and was hard to source five years ago. If one does not have own stocks, one has to rely on gifts from neighbors or purchase from those who have irrigated gardens.

Figure 6.3 Chipata Mushawa sweet potato planting material sources

2013 and 2008 : SAME



All in all, there has been almost no dynamism in any seed channel, and new innovations come only from aid (government or NGO). The only exception is with maize, where mobile vendors have jumped in to fill the gap of 'FISP seed frequently arriving late'—according to the community assessment.

Crop diversification and (few) value added products

Communities also provided overviews of major crops sown in their area, and rated their respective importance for food consumption, income, and possible transformation from raw agricultural products into value-added products geared to increasing revenue margins.

Overview on crops grown

In theory, the Mushawa community reported a fairly large range of crops grown. In practice, only a small core are deemed of key importance. Maize was identified as first priority for food; Cotton was first priority for income; and groundnut was identified as first priority for nutrition. Many of the other crops were grown in only minuscule quantities. Overall also, crop transformation was low, with little added value, mainly for household consumption.

Table 6.10. Chipata- Mushawa . Low Diversity 'important' crops,: little transformation.

Crop	Importance for food	Importance for income	Transformation
Maize	+++	+++	Flour, sampo, beverages
Groundnut	++	++	Peanut butter, cooking oil, sauce
Sunflower	+++	+	Oil, livestock feed
Cotton	-	+++	-
Common beans	+++	+	Protein sauce
Soyabeans	-	+++	Protein sauce, milk, hers
Sweet Potato	+++	+-	none
Cassava	++	+-	Mealymeal fritters
Greengram	+	+	Protein sauce only
Cowpea	+	+-	Protein sauce only
Rice	+	+	None (porridge)
Bambara	+	+	None (protein sauce)

+++ indicates the highest importance. (others rated medium or low)

Low crop diversification

The striking lack of crop diversification has been mentioned previously: 95% of the seed sown was of maize, cotton, or groundnut, with the three figuring as the 'three major crops' for all

household for the both seasons monitored (Table 6.11). However, note for cotton that use is dramatically declining from one season to another.

Table 6.11 Top Three Crops Cited by Households (N=124) for Most Recent and Next Season

Recent (current) season:2012-2013			Next Season: 2013-2014		
Crop	N of HHs	% of HHs	Crop	N of HHs	% of HHs
Maize	123	99.2%	Maize	122	98.4%
Groundnut	107	86.3%	Groundnut	108	87.1%
Cotton	80	64.5%	Cotton	46	37.1%
Sunflower	28	22.6%	Sunflower	40	32.3%
Soya Beans	15	12.1%	Soya Beans	39	31.5%

Source: SSSA Eastern Zambia, June 2013

Specific Crop trends and substitutions

Such uniformity in crop use might normally suggest that these three crops are providing 'relatively well' and are stable within the system. Yet, for two of the three, farmers cite important production challenges and suggest considerable volatility in planting.

Cotton: **Farmer are shifting out of cotton and into sunflower and soybean.**

- A good number of households are dropping cotton from one season to another (65% HH growing in 2012-13, but only 37% planning to grow the 2013-14 season)
  (With higher cotton prices, farmers could shift back into cotton).

Groundnuts are a key food and income crops but there are challenges accessing seed and post-harvest handling as reflected by high levels of aflatoxin.

- The demand for groundnut seed is large – accounting for 32% of all seed sown by kilogram in 2012-2013 season, as reported by interviewed farmers.
- The demand for groundnut seed is growing as interviewed farmers projected to increase the kilograms of groundnut sown by 46% in 2013-2014 planting season.
- The groundnut variety that is considered to be market preferred and improved – Makulu Red – was trading at the same price per kilogram in local markets as the local variety, Chalimbana.
- Over time the key characteristics of Chalimbana may well be lost if true lines of the seed are not maintained and used to refresh the pool of farmers seed periodically.
- Farmer groups and cooperatives which report to be producing either certified or quality declared ground nut indicate that they sell all that they produce.
- Key informants suggest that the biggest constraint to increasing groundnut production is access to basic seed. The main source of basic seed is ICRISAT Malawi followed by a small percentage of basic seed coming from Msekera Research Station.
- Key informants say that groundnut exports to Europe have been reduced by more than half due to high aflatoxin levels (see Box 1) yet production has expanded over the past few years and there is a strong export market from Eastern Zambia into Tanzania, Malawi, and DR Congo.

Box 1: Managing Aflatoxin with ALFASAFE

With IITA and ICRISAT support and USAID funding, a biological control product for aflatoxin reduction in maize and groundnut is being developed. The product is called AFLASAFE and the first set of field trials for Eastern Province was carried out in June 2013. Eventually, this product will be commercialized and made available to farmers. For more information see: www.aflasafe.com and http://www.youtube.com/watch?v=bvZb2127aZk for a video.

Soybean and Sunflower

- On a kilogram basis, farmers project a doubling of sunflower sown and quadrupling of soybean sown from the 2012-2013 season to the 2013-2014 season.
- Agro-dealers report difficulty obtaining sunflower and soybean.

(See Box 2 for soybean varieties being tested in SSSA zones)

Box 2: Soybean Varieties In On Farm Trial Available in Lundazi and Chipata

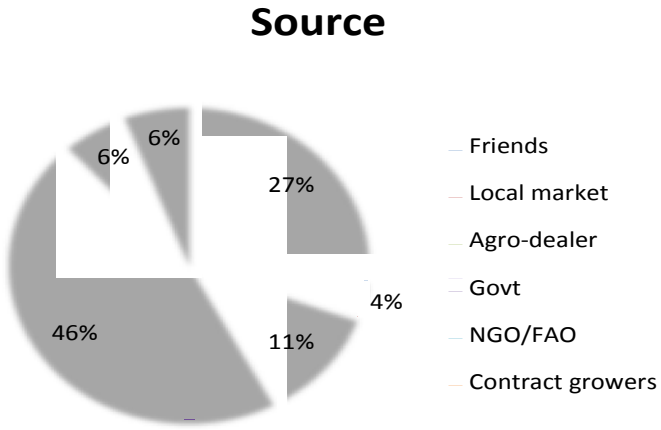
Variety	Characteristic
Lukaka	Big seeds and better yields compared to local variety, medium maturity
TGX 1740	Very high yielding, not yet officially released, greener than other varieties.
TGX 1835	Medium maturity, good yields
TGX 1904	High yielding, early maturity
Magoye	Greener than other varieties, self-inoculating, high -yielding.
Safari	Early maturing, high yielding

Source: Interview with SIMLEZA staff, SSSA Eastern Zambia, Lundazi - June 21, 2013

New varieties

Continuing to search for innovation, the issue of new varieties is addressed. Within the context of assessing seed security, variety introductions can be an economical way to increase production quickly. Overall, 72 % of farmers in the SSSA sample indicate they have accessed a new variety within the last five years, which seems a relatively promising figure. However, upon closer look, access to new varieties is quite constrained: Over 80% of the new entries were either of maize of groundnut, with no farmer reporting accessing a new variety of key legumes such as common bean, cow pea, or pigeon pea. Also, about ¾ of the accessions were free (through government or NGO/FAOs) so few sustainable channels can supply farmers with an array of new varieties on a continuing basis.

Eastern Zambia farmers' source + type of new varieties 2008-2013 (Figure 6.4. Table 6.12).



72% of farmers obtained a new variety

Crop	# Introductions	%
Maize	28	52.0%
Rice	2	
Cassava *	2	
Sweet potato	2	
Groundnut	17	31.0%
Sunflower	2	
Soya Beans	1	
TOTAL-all crops	**54**	

Decentralized Seed Multiplication

Getting access to new varieties will also be contingent on their being multiplied. Decentralized seed producers will be particularly important for the crops not taken up by the private sector, namely most crops except for hybrid maize and vegetable seed.

A good number of seed production groups were visited in the Chipata and Lundazi Distrits during the SSSA (Box 3). While the list seems long, many have started in the last two to three years and many (the majority?) in eastern Zambia are donor supported, especially by the US-funded Feed the Future (FtF) program. Across suppliers, there seems to a strong focus on cotton, groundnuts and soybean, to the near-exclusion of non-commercial legumes. Also, there seemed to be no inspection of the vegetatively-propagated crops by SCCI (see Box 4 for insights on moving forward with sweet potato multiplication).

However fledgling they may be, it is important to be positive about advances in decentralized seed production. Such decentralized enterprises will be have to remain functional on an ongoing basis and they will need to be scaled up if farmers are to have access to new varieties. Well-coordinated farmer groups can reduce the transaction costs associated with seed management training, inputs, post-harvest handling and storage, and accessing output markets.

Equally important, in terms of sustainability, is to put forward a word of caution. Many decentralized multiplication programs reviewed during the SSSA either: gave seed free, gave farmers vouchers to 'buy' seed or sold seed at subsidized prices. In terms of possible ongoing links, several of the traders and agro-dealers interviewed during the SSSA indicated an interest to work directly with farmer groups to sell inputs and to buy outputs: these links need now to be expressly facilitated.

In terms of action areas associated with decentralized production, the following challenges in eastern Zambia were highlighted:

Farmer groups and farmer aggregation are common but not always well-structured: several organizations working with producer groups complained about the lack of technical support and management capacity of farmer organizations with which they work.

There are multiple community-based seed production efforts but with limited coordination

- There is no established coordination or information sharing mechanism across the different contract grower & seed producers ground interviewed.
- Access to foundation seed / competition for basic seed, side selling / not systematic marketing, and low level of technical backstopping are common cited challenges.

Conducting field inspections to validate whether a field meets certification or quality declared seed (QDS) standards is difficult. SCCI has only two inspectors for the entire eastern province and while private sector seed inspectors can be 'deputized', this has only occurred to date with cotton.

Box. 3. Seed Producer groups (mostly Quality-declared seed.) as of June 2013	
Chipata	Lundazi
1. **Msekera Agricultural Research Institute**: gnut, cowpea, beans (basic seed) 2. **Eastern Province Farmers Cooperative** : gnut (1000 farmers) 3. Sheni Agric Supplies Ltd 4. **China Africa Cotton (Commercial)** cotton seed only 5. **Tombwe seed growers**: Tobacco growers – producing gnut seed for food security (50 farmers) 6. **Continental Ginneries Ltd (Commercial)** 7. **Agriculture Science Technology centre** (AST) cotton only 8. Carpriken Agro Shop 9. Anecho Hardware & Agro Dealer 10. MSP Farmers shop 11. Kumawa Agric services 12. Farmers and Gardeners shop 13. Green Veg farmers shop 14. Plant Agrichem Services 15. Ifinite seed program: gnut only (ca 250 farmers) 16. WASAA: 80 – 100 fmrs. Gnut, soy, pigeonpea 17. Chanje: soybean, cowpea (30 farmers)	1. **Mthilakubili seed growers (**50 individual farmers, community NGO supported by Selfhelp Africa)**:** beans, gnut, upland rice, 2. Aliboo Trading Company Ltd 3. **SIMLEZA –Hoya camp (**A food and nutrition program under FTF/ZARI. 30 Farmer growers) soybean, cowpea 4. Kamalonda Stores 5. Mwiza General Dealers 6. Mwiza General Dealers 7. Uncle Wycliffe Seed Center 8. Ifinite seed program (FTF/ZARI program. About 20 Farmer groups): gnut 9. NGOs supporting production of seed of non-commercial crops (beans, rice)
1. COMACO: gnut (ca 2000 farmers in E. Province. "Seed Loan" program run by NGO) 2. Jungle Beat (NGO): gnut, seed loan program (in Chipata and Lundazi) 3. Dunavant: Soybean (Cotton company in Lundazi and Chipata) 4. Aliboo: "seed loan scheme" with soybean and sunflower (Lundazi only) 5. A farmer in Chipangali – growing cassava and selling to community around him (8 ha under cassava) 6. CIP and SCCI multiplying vines of sweet potato but in cannot be certified at present (started about 2 years ago)	

Box 4: Sweet Potato: new varieties and vine multiplication

Sweet potato is a valuable source of energy (roots) and protein and vitamins (leaves) and can produce edible roots and leaves within 3 months of planting. Due to high moisture content it is a low tradeable and stays close to the homestead as opposed to being sold for cash at greater distances like maize or groundnut. Sweet potato is a valuable food security crop. With access to water for irrigating the crop, sweet potato can be a source of energy during the hunger gap. Sweet potato vines can be difficult to store or carry over during the dry season so farmers often require repeated access to planting material. There have been a number of new higher yielding sweet potato varieties developed by

breeders– including varieties high in vitamin a and varieties tolerant to sweet potato viral disease - over the last decade. For these reasons, access to new varieties is important. **New Varieties and Decentralizing Vine Production in Lundazi - Chileka and Muvu Camp** With an initial aim to help students access vines of high vitamin A sweet potato varieties, since 2012 one seed producer group has been managing sweet potato demonstration plots in Muvu and Chileka camp. They have targeted 5 agricultural cooperatives and nearly 400 farmers customers for these varieties. With the support of the International Potato Center (CIP) and Mr. Mudenda of ZARI in Chipata, five varieties are being evaluated this in 2013 in Lundazi. With the support of SCCI Msekera, sweet potato vine producers will follow minimal standards set out under a quality declared seed protocol. Sweet potatoes are planted in Lundazi in February and harvested in May but, thanks to wet-land (dambo) production, there is the possibility for planting materal to be maintained year around in parts of Lundazi. Currently, Kaytindi camp is the center of vine production in Lundazi District.

What are the challenges and opportunities and conditions for success with this model?	
Short-term Promote an open network of vine producers and be transparent in terms of listing the names of producing farmers, locations, and varieties being planted. Train vine producers on disease recognition, positive selection (rogueing), and production techniques to raise vine yields, and introduce them to low cost screening technologies against aphids. Encourage the government and NGO's to not place production orders for vine but rather focus on replicating and out-scaling a decentralized 'small is beautiful approach' to increase farmer access to sweet potato planting material.	Medium term Vine production may be a sustainable business when there are hotly sought after new varieties and when farmers cannot maintain their varieties through the dry season. Identify innovative sweet potato vine producers that can take on risk and would be willing to experiment with different vine production and storage techniques in dry areas. The innovators could promote sustainable sweet potato production – through dry storage of vines - in areas where maintaining vines in dry season is the key impediment to sustainable sweet potato production.

Box 5: Sweet Potato Varieties being evaluated in Lundazi, 2012-13

Variety	**Characteristics**
Orange Chigovwa	*High Yielding / Large Tubers* *Can produde with low rainfall* *Susceptible to disease, especially SPVD*
Olympia	*White flesh / Can produce with low rainfall* *Lower yield to organge chigovwa*
Twatasha	*Similar to Orange Chigovwa in yield* *Preferred because of its leaves.* *Can produce with low rainfall.*
Zambezi	*Called Kenya or Kapiri – from Mozambique* *Higher yield than local varieties* *White flesh*
Chigovwa	*Looks like Zambezi, similar charazteristics.*

Source: Interview with SIMLEZA staff, SSSA Eastern Zambia, Lundazi - June 21, 2013

Manure/Compost, Fertilizer, Pesticide + Storage Chemical Use

Select input use was also examined during the eastern Zambia SSSA as a complement to the seed security analysis. This included examining farmers' use of a) organic fertilizer: manure and compost; b) inorganic fertilizer; c) pesticides and d) storage chemicals. As an overview, Table 6.13 summarizes the % of farmers at both sites using or intending to use these inputs

for 2012-13 and 2013-14 main seasons. Also as a quick overview, Table 6.14 indicates the crops on which the inputs are being applied. Except for manure/compost, all these inputs are generally used by ½ to ¾ of the population, with mineral fertilizer use being particularly high. However, input use was generally on the same narrow set of crops, maize and cotton. Others receive few amendments. Additional insights appear below table 6.14.

Table 6.13: Percent (%) of Farmers across sites of Chipata and Lundazi using (or intending to use) select inputs (SSSA sample N=124)

Input	***Main season 2012-13***	***Main season 2013-14***
Manure/compost	16.9	44.3
Mineral fertilizer	65.3	74.0
Pesticides: foliar sprays	59.7	54.5
Storage chemicals	44.4	63.4

Table 6.14 Crops on which specific inputs were used 2012-13 (% of cases where inputs applied) .

Input	***Maize***	***Cotton***	***G'nut***	***Common beans***	***Vege-tables***	***Other***
Manure/compost	61	8		4	17	8
Mineral fertilizer	90	7		1	2	
Pesticides: foliar sprays	3	91			6	
Storage chemicals	95		2	3		

Manure/Compost Use

The manure/compost applied consisted mainly of animal refuse (large stock and poultry waste). Crop residues were only used in 5% of cases where matter was applied. Farmers not using manure/compost generally indicated it was not available or not necessary (each presenting 1/5 of cases, respectively). Another 1/3 of farmers indicated the non-application as 'they do not know how to use compost/manure'. (This might be an area for follow-up and intervention).

Mineral Fertilizer Use

Mineral fertilizer is well known and abundantly used by the majority of farmers, near exclusively on maize. Those not using mineral fertilizer generally indicated it is 'too expensive' (81% of cases for non-use).

Pesticide Use

Foliar sprays are used abundantly and mostly on cotton. Reasons for non-use were two-fold (and in equal measure). They were ' too expensive' or 'not necessary'.

Important is that misuse of pesticides raised particular concerns as a good number of farmers use cotton pesticides for maize seed storage! Possible health risks here should be carefully assessed.

Seed storage : storage losses and chemicals used

Seed storage losses raised particular concerns during the SSSA. Seventy percent of households reported losses during the main storage period of 2012, with degree of losses high on several crops: maize, cowpea, groundnut (Table 6.15).

A range of storage products was being used, the most alarming of which were foliar pesticides given by commercial companies to treat cotton pests in the field--- and not suitable for storage (or potential consumption!). Campaigns to raise awareness of the dangers of pesticide misuse might seem like an immediate priority.

Table 6.15: Farmer reporting loss in storage . 2012 (N=124)

What losses did you have in storage?		
Crop	**N**	**mean loss (%)**
Maize	86	**38.4%**
Sweet potato	1	**60.0%**
Groundnut	17	**21.4%**
Common beans	1	**75.0%**
Cowpea	3	**61.7%**
TOTAL-all crops	54	**41.7%**

Source: SSSA Eastern Zambia, June 2013

In terms of maize, the large grain borer *(P. Trunscatus*) is endemic in eastern Zambia. While there has been limited research trends storage loss, farmers' decisions to adopt high-yielding improved maize varieties seem to have direct consequences on extent of loss. (Higher yielding varieties are often more susceptible to storage pests than lower yielding traditional varieties). Evidence from Malawi suggests that access to storage chemicals can have a positive and significant effect on both farmer adoption of improved seed and the area that households plant to improved maize (see Ricker-Gilbert and Jones, 2012).

Box 6 presents a variety of options that farmers may take to manage on-farm storage losses. The comparisons draw from a few storage technology options practiced by farmers in East and Southern Africa.

Box 6: Maize Storage Options and Costs			
Option	*Storage Cost per 90 KG**	*Key Advantage*	*Efficacy / Adoption Issue*
Actellic Super with single layer bag, polypropolene	$.6 USD per bag $3.3 USD of actellic super per bag	Good control for up to 4 months against weevils and P. truncates , low toxicity, inexpensive.	Lot of adulterated products on market, need to repeat application.
Metal Silos	$110 USD	Highly effective and durable.	Very expensive, sheet metal accounts for more than ½ cost.
PICS SACK	$2.5-4.5 USD	Effective and inexpensive, double layer of high density polyurethane provides more durability and improved hermetic seal over conventional single layer clear plastic bags.	LBG (P. truncates) can easily bore through plastic (inside out) breaking the hermetic seal. Under ideal conditions, the sack can lass 3-4 years, necessitating a sustainable supply chain for re-provision.
GrainPro SuperBag	$4-5 USD	Effective and inexpensive, single layer of high density polyurethane provides more durability and improved hermetic seal over conventional single layer clear plastic bags.	LBG (P. truncates) can easily bore through plastic (inside out) breaking the hermetic seal. Under ideal conditions, the sack can lass 3-4 years, necessitating a sustainable supply chain for re-provision.

*Costs vary by country, supply chain, and vendor but are indicative. For a breakdown of the effectiveness of these technologies in field see DeGroote 2013.

Comparing possible differences in seed security-related issues:

- ***Male and female-headed Households***
- ***Farmers accessing different land areas***

As a final thrust, The SSSA teams also examined possible differences within populations, comparing male and female-headed households and comparing households with diverse areas under cultivation (below 1/2 acre, ½ -1 acre, 1-2 acres, over 2 acres). Searching for possible differences, all issues within this chapter were examined: for example, seed sources used, quantities planted, use of new varieties, manure/compost, storage chemicals, access to seed aid.

In terms of male- versus female-headed households, many statistically significant differences were noted, with all differences showing female-headed households at considerable disadvantage (see Table 6.16 for full details). On many issues, there are stress indicators: female-headed households sow less; have accessed fewer new varieties in the last five years, less frequently use fertilizer and manure./compost; and have smaller family sizes (perhaps leading to less access to labor). Also, as a key indicator of stress: for female-headed households, the government (FISP) is the main source of maize seed, with home-saved in second place. This is the inverse of the whole population.

In terms of households with diverse land areas available for cultivation, another two statistically significant differences were observed. Farmers with less than 1 ha are less likely to obtain a new variety than farmers with larger farm sizes. Also, large-sized farms are more likely to use fertilizer than smaller-sized ones.

Table 6.16: Differences in select seed security issues between M/F headed households and those with diverse cultivated areas.

Issue	Differences? (t-tests)
Household headed by different genders	
sowing amounts 2012-13	*yes- female-headed households are not increasing sowing rates to the same extent as male-headed.*
use compost/manure	*yes -female-headed households less likely to use compts/manure*
use of mineral fertilizer	*yes -female-headed households less likely to use fertilizer*
use new varieties?	*Yes- female-headed households less likely to get access to a new variety*
chemical storage products	*Yes- female-headed households less likely to use chemical storage products*
times received seed aid?	*Yes- female-headed households less likely to receive seed aid*
family sizes	*Yes- female headed households have significantly smaller sizes. While this does not necessarily mean they have less labor (as ages are not specified), it is probably safe to infer than labor availability is restricted for female-headed households.*
Households cultivating different size land areas	
sowing amounts 2010-2011	*no*
sowing amounts 2011-2012	*no*
use of compost/manure	*no*
use of mineral fertilizer	*yes- larger farmers are more likely to use fertilizer than smaller-sized ones*
use of new varieties	*yes- Farmers with less than 1 ha are less likely to obtain a new variety than farmers with larger farm sizes*
times received seed aid	*no*

These differences show that female-headed household have seed security disadvantages on multiple fronts, and also indicate that those with smaller holdings are less likely to use new varieties and fertilizer. These differences merit more intensive scrutiny. Simply, it seems the more vulnerable may have less access to innovations.

Summary: Chronic Seed Security Findings and Emerging Opportunities

This summary overview suggests that there are many chronic seed security stresses in eastern Zambia, coupled with but a few identified positive innovations. There seems to be ample room for strengthening seed systems.

In summary:

1. There has been almost no dynamism in any seed channel. The only exception is with maize, where mobile vendors have jumped in to fill the gap of 'FISP seed frequently arriving late'—according to the community assessment.

2. There is appallingly little crop diversification. Maize was identified as first priority for food; cotton was first priority for income; and groundnut was identified as first priority for nutrition. Many of the other crops were grown in only minuscule quantities. Overall also, crop transformation was very low, with little added value (and geared mainly toward household consumption).

3. The uniformity in crop use might normally suggest that these three crops (maize, groundnut and cotton) are providing 'relatively well' and are stable within the system. However, for two of staples, farmers cite important challenges and production volatility. Quality groundnut seed is difficult to access and maintain (possibly also linked to limited basic seed and aflatoxin incidence). The lowering prices for cotton means that many farmers are moving away from the crop, substituting sunflower or soybean in its place.

4. Overall, 72 % of farmers in the SSSA sample indicate they have accessed a new variety within the last five years. While this seems a relatively promising figure, closer scrutiny suggests access to new varieties is quite constrained: Over 80% of the new entries were maize or groundnut, with no farmer reporting accessing a new variety of key legumes such as common bean, cow pea, or pigeon pea.

5. About ¾ of the new variety accessions have delivered free in the last five years (through government or NGO/FAOs). There are few sustainable delivery channels that can supply farmers with an array of new varieties on a continuing basis.

6. Decentralized seed multiplication initiatives are growing in the zone, especially in the last two to three years. This is a promising sign as such decentralized work will be key especially for the legumes and vegetatively-propagated crops. On the negative side; a) producer groups complain about lack or technical support and management capacity; b) coordination among groups in eastern Zambia is very limited; and c) capacity to validate quality (whether certified or Quality Declared Seed- QDS) is minimal. (It appears SCCI has only two inspectors for the entire Eastern Province).

7. In terms of inputs, mineral fertilizers, and pesticide foliar sprays are generally used by ½-3/4 of the population sampled. However, they are used near exclusively on maize and cotton (for 90-91% of the applications). Manure and compost are used to a lesser degree, on maize (61% of the sample) and on vegetables (17% of the populations). Many claim not to know how to use these organic inputs.

8. Storage losses are reported as very high. Maize particularly is damaged. Seventy percent of households report average storage losses of almost 40%. Equally troubling is farmer management response as many are using cotton pesticides for storing maize (i.e. chemicals which are potentially toxic if consumed).

9. Female-headed households face many seed security concerns to a degree that is statistically different from male-headed households. Female-headed households sow less; have accessed fewer new varieties in the last five years, less frequently use fertilizer and manure./compost; and have smaller family sizes (perhaps leading to less access to labor). Also, as a key indicator of stress: for female-headed households, the government (FISP) is the main source of maize seed, with home-saved in second place. This is the inverse of the whole population.

10. Households with smaller areas for cultivation (i.e. a rough proxy for poorer households) also have significantly different patterns from those with more land. Two were noted: farmers with less than 1 ha are less likely to obtain a new variety than farmers with larger farm sizes. Also, large-sized farms are more likely to use fertilizer than smaller-sized ones.

For both 9 and 10, these trends merit further investigation. Simply, it seems the more vulnerable may have less access to innovations.

Having summarized the findings, we now move to recommendations for action.

VII. ASSESSMENT RECOMMENDATIONS

Based on the SSSA findings, concrete action plans have been detailed for each SSSA site (see Annex I). Here we recommend areas for action that crosscut sites and apply to eastern Zambia more generally. These are divided between 'short-term recommendations', that is areas where actions can and should unfold 'as soon as possible' (i.e. the next season), and 'medium term recommendations' where actions might be taken in the next 1-3 seasons.

Short Term Recommendations (immediate action needed)

1. Use DiNER voucher and fair programs to increase diversity in smallholder farmer production systems.

Seed Vouchers and Fairs (SV&F) (CRS, 2002) have been used successfully by CRS in Southern Africa for more than 5 years and have proven to be an effective means to assist smallholder farmers to re-start their cropping systems after a shock such as a flood, or in areas that endure chronic stress, such as drought. Diversity for Nutrition and Enhanced Resilience (DiNER) voucher and fair programs are an advance on the usual SV&F methodology in that they use the same basic approach, but add an additional element to ensure that smallholder farmers get access to diverse materials that are otherwise difficult to obtain in many rural areas. DiNERs (pioneered in Malawi 2012) have proved helpful for increasing the diversity of the production system – and thereby also increasing the resilience of the system and the potential for enhanced dietary diversity. Items which might be included in DiNER V&F programs in Eastern Province might include: tree seedlings (fruit, fodder, fertilizer, fuel); both local and commercial vegetables; sweet potato vines; cuttings of improved varieties of cassava; local and/or improved varieties of important legume crops (e.g., cowpeas); cereals; and small livestock. For increased benefit to communities and increased incentive to commercial company participation, both vouchers and cash sales might best be allowed in eastern Zambia DiNERs (though vulnerable farmers with vouchers should probably be given the first opportunities).

This activity could be led by the Mawa Project, but would benefit from collaboration with other seed/planting material production programs in the Province, especially farmer-based seed production programs.

2. Catalyze a "small farmer oriented" seed production and marketing stakeholder group for Eastern Province with initial focus on vegetatively -propagated crops and legumes.

There are a large number of formal and informal seed production activities in Eastern Province, but they are not coordinated. This leads to considerable inefficiencies: for example, different groups purchase foundation seed for groundnuts from the same Foundation seed source in Malawi – with associated transport and clearing costs for each different shipment; farmer-based seed production groups produce seed but lack a market (which could be jointly developed!); some grower associations seek and fail to find seed of the same crops/varieties which others already have locally. Seed sector actors (MAL, ZARI, CGIAR, NGO's, Private Sector) need to establish a forum in eastern Zambia through which they come together and

discuss how to improve coordination on the production and delivery of seed of varied types, The focus of this work initially should be on legume and vegetatively-propagated crops, since this is where present need is greatest. Compelling issues, such as relative lack of foundation seed for groundnuts, might be given immediate priority. Similarly, discussion of better marketing possibilities for seed of non-commercial crops should be explored. This forum could also share information on the performance and availability of improved varieties for eastern Province and coordinate with SCCI to promote field inspections for farmer-based seed producer groups using 'quality declared seed' standards. The overall aim of such stakeholder forum would be to increase access to improved varieties of both commercial and non-commercial crops as an approach to increasing the productivity, nutritional options, and resilience of smallholder farming systems.

Not all seed production would need to be farmer based, but all farmer-based seed production should be done for profit, with robust business plans, to assure sustainability (see recommendation number 4).

3. Establish a Working Task Force on Improved Storage Methods with focus on maize and legumes and identify a variety of storage options suitable for different farmer segments.

There is an urgent need to counteract storage losses in eastern Zambia. Seed sector actors (MAL, ZARI, CYMMT, IITA, NGO's, Private Sector) should establish a working task force on storage options for maize and legumes (and particularly cowpea), with a focus on small holders. This could be a sub-group of the seed production stakeholder group mentioned above. The fact that large grain borer is endemic, and the high reported loss rates of maize in storage during this SSSA, suggest that a concerted effort is needed to evaluate and promote different storage options for maize. The known difficulties with storage of cowpea and other legumes, and their dietary importance, warrant a simultaneous concern with legume storage systems. Grain storage systems should be evaluated for their cost, effectiveness, safety, and access and adoption issues for farmers. The key steps for assessing storage issues include: a. Understanding the farming system, seasonality and practice; b. Estimating the extent of loss; c. Establishing basic trials to assess different storage methods in terms of efficacy and cost effectiveness; and d. Ensuring farmers and farmer organizations participate directly in the evaluations; d. Cost-benefit analysis at farm and project level for the storage technologies.

***As a truly pressing need, the misuse and counterfeit labelling of pesticides needs to be addressed*.** The common use of cotton pesticide in grain and seed storage may have substantial health risks. Falsely labelled and counterfeit pesticide means that farmers may be getting inferior and even dangerous products. Hence, there is immediate need for a public information campaign and farm level training on the use of storage chemicals and on importance of distinguishing counterfeit from original products.

Medium Term Recommendations (for next 1-3 seasons)

4. Develop sustainable variety delivery systems, offering multiple channels.

New improved varieties are not reaching farmers through channels that are sustainable. (They are mostly being given as aid—and free). Also the heavy emphasis of new maize varieties is crowding out possibilities for moving a much larger range of genetic material, especially different kinds of legumes.

Delivery mechanisms for giving all farmers regular access to a range of new varieties need to be supported. Sale through agro-dealers provides only one venue but should be encouraged, especially in small pack sizes (100, 200, 500 g)—not the 5 kg now put on offer. Sale in regular country stores, open markets or even supermarkets (with proper labeling) might also be considered. In addition, agro-enterprise groups and seed loan groups (with clear marketing plans) might be formed around seed enterprise (point 5 below). In all cases, enhanced delivery options need to be complemented by vigorous media campaigns that help farmers make informed decisions about whether to use the new materials (e.g. through farm radio, or churches).

5. Identify and promote profitable decentralized seed production and marketing possibilities

The Seed Stakeholder group in Eastern Province should collectively assess and share lessons on effective and durable farmer-based seed (or planting material) production options for non-commercial crops. Comprised of farmers and representatives from MAL, ZARI, CGIAR, NGO's, and the private sector, this group should identify and promote farmer based seed production models which:

- are commercially viable;
- can serve the entire value chain (home consumption needs, buyers and/or food processing companies); and
- are tied to continuing sources of new germplasm.

In all cases, farmer-based seed production groups should receive training in key skill sets and develop viable and sustainable business plans. They should also include innovative and effective seed marketing systems, such as the above-mentioned sales through small packs.

6. Build Farmer organizations at community level and enhance their technical and management capacities.

The FtF projects, along with private sector and backstopping and support from MAL and ZNFU, should build strong farmer groups and facilitate the development of strong linkages between these groups and the private sector for input supply and output marketing. The strengthening of farmer groups would be in form of building their capacities in key skill sets including: group organization and management, savings and financial management, sustainable production and natural resource management, innovation and business and marketing skills. Mawa has modules for front-line workers in all these skill sets and is already planning to deliver them to some groups.

The medium-term outcome would be to strengthen the farmer-market interface and make it more efficient and profitable for all concerned. The longer-term outcome would be to develop strong working relationships between farmers and input suppliers, output buyers, and business development services (BDS) that would make the whole system more durable, sustainable and scalable.

7. **Investigate reasons for unusual seed security vulnerability among female-headed households.**

The degree of multiple seed security stresses among female-headed households is alarming. Under-production of any group affects the whole economy of eastern Zambia. As a reminder: the SSSA showed that female-headed households sow less; have accessed fewer new varieties in the last five years, less frequently use fertilizer and manure./compost; and have smaller family sizes (perhaps leading to less access to labor).

Each of these constraints needs to be understood in depth. Special gender-differentiated studies and analyses need to be effected. Multiple strategies to alleviate possible stresses should be tested. Certainly, finding ways to allow female-headed households to access new varieties should be an activity which can be implemented relatively quickly.

The above recommendations are relatively broad and are meant to complement the site-specific Action Plans (Annex 1). Given the chronically- depressed nature of seed security in eastern Zambia, there is considerable room for strengthening seed systems with a range of focused initiatives in a relatively short time-frame.

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IX. ANNEXES

I. **Site-specific action plans**
   a. **Chipata**
   b. **Lundazi**

II. **Summary of observation, across sites**

III. **Household survey data tables**

ANNEX I: ACTION PLANS, by Site

SSSA CHIPATA : ACTION PLAN		
Problem	**Short-term response** **1-2 seasons**	**Medium -term response** **3-5 seasons**
1. Storage losses Maize in granary	• Mawa, Profit + and MAL conduct economic evaluations of possible improved storage methods for grain • NGOs/FTF projects and MAL promote use of correct chemicals in storage (e.g.Actelic) • Mawa, Profit+ and MAL work with agro-dealers to ensure that the chemicals are available. • Mawa and Profit+ work with agro-dealers to ensure appropriate chemicals are accessible in appropriate units for smallholder farmers	• Test and promote a range of improved storage methods (e.g., CIMMYT metal silos; PICS double/triple bags?) and provide farmers with options
2. Storage losses- legumes individual stocks (Especially in cow peas)	• Mawa, Profit + and MAL conduct economic evaluations of possible improved storage methods for legumes (including traditional methods and/or addition of tephrosia) • NGOs/FTF projects and MAL promote use of appropriate methods and correct chemicals in storage (e.g.Actelic) • Mawa, Profit+ and MAL work with agro-dealers to ensure that the chemicals are available. • Mawa and Profit+ work with agro-dealers to ensure appropriate chemicals are accessible in appropriate units for smallholder farmers	• Test and promote a range of improved storage methods (e.g., CIMMYT metal silos; PICS double/triple bags?) and provide farmers with options
3. Sweet potato vines (low rainfall, low availability	• Promote home nurseries with grey-water from home bathing areas • Obtain starter vines from Zamseed (order in advance) and add to DiNERS (screen for viruses while growing) • Collaborate with Profit+ to add sweet potato vine maintenance in vegetable gardens in dambo areas • Work with CIP and their Lead Farmers to maintain and disseminate appropriate varieties of sweet potato (maintain focus on "virus free")	• Mawa/GART/CIP/Msekera review, develop and promote farmer-based market-oriented systems for producing and disseminating planting material for improved varieties of sweet potato • SCCI develops QDS protocol to ensure accountability in the "seed system"
4. Sweet potato and cassava loss due to livestock damage (cattle, goats)	• Mawa and Profit+ encourage farmers to maintain vines in vegetable gardens and/or fence off the areas where they are maintaining the sweet potato vines at home	

5. Lack of basic seed for legumes (availability)	• SCCI, MAL (prov/distric) convene meeting of interested NGOs/Projects to develop an economically viable and durable system to increase production of basic seed for G. nut by Msekera and/or GART • Raise producer group awareness on the process to access basic seed for g. nut.	• Implement a deman-led (contractual?) system of basic seed production and purchase by NGOs and Farmer Groups. • SSSA consider basic seed for non-groundnut legumes
6. Differential access to basic seed available (some get basic seed and others don't)	* Msekera requires that request for basic seed purchase of g.nut should come by August / Septemberas opposed to first come first serve as is currently the case..	* Msekera and Profit Plus Musika look at establishing auction based systems for g.nut basic seed allocation (highest bidding for commercial buyers)
7. Lack of availability of good quality legume seed to support a. To support increased production b. For direct farmers use	• Raise awareness on varietal performance of g. nut (MGV4-MGV5) versus Chalimbana, the local variety but government down plays it due to yield but farmers love it. • Review g/ nut adoption (farmer appreciation / use of different varieties) and PVS. •	* MAWA, GART, and SCCI to review and test different decentralized production models (for non ground nuts) that have an explicit marketing delivery component… models like WASA. * Identify existing non g.nut producers / specialists through the market traders and MUGABI geo-zone as the entry point for beans.
8. Access to new legume varieties	* Mawa ensure that legumes are accessible via DINERS	* Mawa and Profit Plus should work with agro-dealers to reduce packet size * Put small packets on sale (50 – 500 grams) in non=agro-dealers (open market bean seller as one example, once a week rural markets with the specialized traders) * To reduce corruption among vendors (for all inputs) encourage communities to identify their 'agent' (see the Agent Program in Zimbabwe and Zambia).
9. Awareness/demand creation for new varieties (promotion, knowledge sharing)	* Mawa, GART, SCCI review demo protocols / process and build on their success. * SCCI and Mawa Confirm Zambia law regarding packet size for different crops and allowable sales outlets. / channels. *Mawa, ProfitPlus, and other interest parties raise awareness / promotion on small packs and who is offering them for sale.	* in medium term raise availability / access via recommendation above. * Mawa, GART, SCCI Explore use f ICT and RADIO for promotion (Zambia National Farmers Union offers exciting examples on use of ICT under 'LIMA LINKS')
10. Low use of animal manure (reasons, a opportunity?)	* Mawa / MAL / GART - develop demos where farmers can be trained and see how to treat, apply, use manure. * Mawa / MAL / GART develop systems responding to the key reasons (transport / knowledge on use)	

	* CFU (Conservation Farming Unit already doing this so tap into their work and look for synergy)	
11. Misuse of cotton field pesticides for field storage and vegetable gardens	* MAL/ Mawa and engage agro-dealers and cottons companies to develop education, information, communication campaign focused on FARMERS to change their behavior. * MAL /Mawa work with Cotton Companies to look at allocation of chemicals and associated health messaging. *The dangers of pesticides misuse to be incorporated in the Mawa monthly messaging to farmers groups, SILC and care groups. *Engage cotton companies to take responsibilities in the distribution and use of chemicals by the farmers.	
12. Lack of coordination among seed actors in eastern province region	* MAL can lead – something we already do with cotton companies – * Raise this issue in the report out and draft TOR for a coordination body (composition and rules and respos) at Provincial level * Establish a seed stakeholder coordinating committee	* Strengthen the coordination amongst seed stakeholders.
13. Lack of crop diversification (beyond maize, gnut, cotton)	• Mawa – review current efforts on promotion/use/sale of crops beyond maize, gnut and cotton • Mawa work with Province, district and community health workers SIMLEZA and to fully understand nutritional issues in E. Province, and target appropriate crops to address • Mawa, MAL expand demonstrations/training programs on use/transformation of additional crops	• Mawa/Profit+, engage traders, MAL, and Look at improving the value chains for additional crops (soybean, sunflower, vegetables) • Consider promoting diversification into small livestock • Mawa link with SIMLEZA, PABRA, CIP, Consider/promote transformation of diverse crops (sweet potato, soy, cowpea, beans) • Promote production and home use of additional/new crops like pigeonpea
14. Aflatoxin levels in Maize and Gnut…	• Stakeholders to sensitize farmers on the methods of reducing aflatoxins.	Mawa to followup with IITA /ICRISAT for the result of the Aflatoxin study
15. Cheap agro chemical from China	• TBD	
16. High storage losses in Cowpea and beans	• Mawa, MAL to conduct farmers trainings/demos in graing storage management,	• Promotion of varieties that are resistant to storage pest damage
17. Low access to certified seed	• Mawa to promote SILC groups • Encourage establishment of seed outlets close to farmers	• Promote income generating activities amongst the farmers
17. No explicit business/marketing plans for most seed groups	• Mawa, MAL to training the farmer groups in business /marketing skills	• Facilitate market linkages

SSSA Lundazi: ACTION PLAN		
Problem	**Short-term response** **1-2 seasons**	**Medium -term response** **3-5 seasons**
1. Virtually no sourcing outside own stock and neighbors / family (particularly for maize) Very common for farmers in Munyukwa to access seed through labor and to practice seed exchange.	• Use of DiNERS for most vulnerable farmers – where seed access is a chronic constraint to production – linked to community seed producers and to agro-dealers. • To reduce corruption among mobile vendors (for all inputs) encourage communities to identify their 'agent' (see the Agent Program in Zimbabwe and Zambia).	• Mawa and Profit Plus should work with agro-dealers and mobile vendors to reduce packet size. • Put small packets on sale (50 – 500 grams)in non-agro-dealers (open market bean seller as one example, once a week rural markets with the specialized traders)
2. High reported losses in maize, this particularly affects the poor in terms of food loss and necessitating higher seeding rates. The traditional way of harvesting where they heap the crop for a period of two months right there in the field before they take it to the granary results in yield losses. Use of hermetic seal in storage is rare, bags when used are porous. Misuse of cotton field pesticides for field storage and vegetable gardens.	• Mawa, Profit + and MAL conduct economic evaluations of different improved storage methods with farmers to collectively understand costs & benefit of accessing and using different options of improved HH storage with and without chemicals (traditional, hermetic metal silos hermetic bags). • Mawa staff and partners link up with CIMMYT and PICS to understand the technology and promote farmer understanding of hermetic storage. • Keep project and subsidies – to extent possible - out of the storage supply chain as direct participant and as oriented to facilitation. • NGOs/FTF projects and MAL work with satellite agro-dealers and vendors to ensure that the correct chemicals (e.g. Actelic) are available and in appropriate units for small holder farmer. • MAL/ Mawa, NGOs/FTF projects, and cotton companies develop education, information, communication campaign focused on chemical use.	• Test and promote a range of improved storage methods (e.g., CIMMYT metal silos; PICS double bags: Grain Pro) and provide farmers with options. • Develop functioning commercial supply chain for more than a single improved storage technology.

Problem	Short term response	Medium term response
3. Low level of farmer aggregation (farmer groups, cooperatives) reduces farmer access to both input and output markets and related business development services. Some famers have access to FISP but very few (government) subsidy for fertilizer / hybrid maize. To access FISP you must be part of the active registered cooperative.	• FTF Projects and MAL assess extent of farmer aggregations / current issues – challenges / types of groups – aggregations. • FTF Projects and MAL facilitate farmer organization. / training on group dynamic / management.	• FTF Projects promote Farmer group 5 skill set training.
4. Almost no access to a new variety in any crop outside of an improved rice variety for some farmers.	• Establish linkages with on-going participatory variety trials (cowpea, soya, sweet potato, cassava) under different project. • Mawa, GART, SCCI review demo protocols/process and build on their success. • Promote farmer access to new varieties by replicating successful PVS (cowpea, soya, sweet potato, cassavas) where farmers have strong interest in these crops. • Mawa, GART, and SCCI to review and test different decentralized production models (for non-ground nuts) that have an explicit marketing delivery component… models like WASA. • Mawa, GART, SCCI Explore use ICT and RADIO for promotion (Zambia National Farmers Union offers exciting examples on use of ICT under 'LIMA LINKS')	• SCCI and Mawa Confirm Zambia law regarding packet size for different crops and allowable sale channels. • Mawa, ProfitPlus, and other interest parties raise awareness / promotion on small packs and who is offering them for sale.
Problem	**Short term response**	**Medium term response**
5. There is low use of hybrid maize seeds from farmers, low farmer demand for hybrid maize, low farmer capacity to buy hybrid	• Demo plots as the methods of teaching farmers on hybrids seed maize • Awareness creation to the community on the use of hybrid seeds to understand why farmers don't use the hybrid seeds/ferts(demos)	• Encourage farmers to join SILC groups to raise farmer financial capacity to purchase

maize, and low hybrid maize availability in the assessment zone.	• Conduct positive deviance (farmers using hybrids) to better understand why, and how they use hybrids	• Linking of the hybrid farmers in the hybrids marketing channels • Promote the use of improved storage technologies and methods for hybrid maize
6. For income, farmer are shifting out of cotton and into sunflower and soya and cowpea but input and output markets and related BDS are not well developed.	• FTF Projects and MAL work with farmers and private sector to promote farmer aggregation to lower transaction costs, increase market channels, promote price stability. • FTF Projects and MAL link producers with district marketing associations (specific focus for cowpea, soya, sunflower) and use of ICT to raise producer / buyer awareness on price and availability. • FTF Projects and MAL Promote linkages between existing seed producers (g.nut, soya, cowpea) and farmers and other buyers to promote transparency. • FTF Projects and MAL identify relative efficiency of existing seed input supply systems (e.g., seed loans)	• All actors promote durable seed and input supply systems. • SCCI, MAL, and community based seed producers review and promote decentralized / producer driven QDS.
Problem	**Short term response**	**Medium term response**
7. Large yield gap relative to actual versus potential productivity of Soya, Sunflower and Cowpea.	• Mawa, MAL improved linkages among FTF projects / extension and existing research led initiatives on all crops (g.nut, sunflower, soya, maize, cowpea) to identify farmer preferred varieties and production enhancing technology / practice. • Mawa. MAL, and NGOs/FTF projects identify best bet agronomy (early planting / timely weeding) and production (example with SOYA is double density and use of innoculants, encourage cowpea-maize intercrops, sunflower crop rotation with legume and maize and use of composite SF varieties).	

8. Cowpea has large storage loss / weevils, more so for newly promoted varieties, this undermines the development of the value chain and full inclusion of poor and medium scale farmers.	• Mawa, Profit + and MAL conduct economic evaluations of different improved storage methods with farmers to collectively understand costs & benefit of accessing and using different options of improved HH storage with and without chemicals (traditional, hermetic metal silos hermetic bags). • Mawa staff and partners link up with CIMMYT and PICS to understand the technology and promote farmer understanding of hermetic storage. • Keep project and subsidies – to extent possible - out of the storage supply chain as direct participant and as oriented to facilitation. • NGOs/FTF projects and MAL work with satellite agro-dealers and vendors to ensure that the correct chemicals (e.g. Actelic) are available and in appropriate units for small holder farmer. • MAL/ Mawa, NGOs/FTF projects, and cotton companies develop education, information, communication campaign focused on chemical use.	• Test and promote a range of improved storage methods (e.g., CIMMYT metal silos; PICS double bags: Grain Pro) and provide farmers with options. • Develop functioning commercial supply chain for more than a single improved storage technology.
9. Despite cassava being noted as third most important FS crop for food security in Munyukwa camps there is very limited varieties (2) making the crop susceptible to viral disease and undermining the potential for cassava to serve as a viable food security crop, particularly in times of drought.	• Replicate IITA/MSEKERA cassava PVS work in 2-3 cottages within Munyukwa camps. (Put up demonstration plots for training and learning purposes) • Trainings on transformation of cassava (MAWA, MAL e.g cassava meal,)	• Promote decentralized cassava production and QDS – with aim to commercialize and promote farmer access to high quality planting material.(SCCI and MAL)
10. Coordination of Seed Intervention / Programs are diverse and not well coordination / shared.	• Raise this issue in the report out and draft TOR for a coordination body (composition and rules and responsibilities) at Provincial level.	• Establish a coordination platform under MAL/ZARI to coordinate activities /bring multiple seed system actors together. • Pluralistic – public / private collaboration to develop durable and effective seed systems.

ANNEX II: Household Survey : Select Data Tables, Across sites

Seed Planted and the Sources Farmers Used, 2012-2013 – All Households (N=124)

					% of total						
Crop	Total kg sowed	Home Saved / Own Stock	Carryover - Maize Hybrids	Friends, Neighbors, Relatives	Local Market	Agro-Input Dealer	Gov't.	NGO / FAO	Contract Seed Growers	Other	TOTAL %
Maize	2985.0	**50.6**	0.7	6.9	0.2	7.9	**32.0**	0.7	0.0	1.2	**100.0**
Millets	0.5	**100.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Sweet potato	0.0	0.0	0.0	**100.0**	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Groundnut	2209.5	**60.5**	0.0	29.7	6.3	0.0	0.5	0.0	0.2	2.9	**100.0**
Common beans	25.0	0.0	0.0	0.0	**100.0**	0.0	0.0	0.0	0.0	0.0	**100.0**
Cowpea	3.0	0.0	0.0	**100.0**	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Sunflower	170.5	**40.8**	2.9	24.0	0.0	26.4	0.0	5.9	0.0	0.0	**100.0**
Cotton	1344.5	0.0	0.4	0.7	0.1	1.1	0.0	0.0	**97.6**	0.0	**100.0**
Soya Beans	141.5	1.1	0.0	**35.3**	24.7	**35.3**	0.0	3.5	0.0	0.0	**100.0**
TOTAL-all crops	6879.5	**42.4**	0.4	14.0	3.0	5.0	14.0	0.5	19.1	1.5	100.0

Source: SSSA Eastern Zambia, June 2013

Seed Planted and the Seed Sources Used, 2012-2013 – Female Headed Households (N=27)

Crop	**Total kg sowed**	Home saved /own stock	Carryover - maize hybrids	friends, neighbours, relatives	local market	agro-input dealer	community-based seed groups	government	NGO / FAO	contract seed growers	Other	TOTAL %
Maize	756.0	**39.7**	0.0	6.7	0.0	2.6	0.0	**50.9**	0.0	0.0	0.0	**100.0**
Groundnut	364.0	**72.0**	0.0	23.9	1.4	0.0	0.0	0.0	0.0	0.0	2.7	**100.0**
Sunflower	26.5	**56.6**	0.0	24.5	0.0	18.9	0.0	0.0	0.0	0.0	0.0	**100.0**
Cotton	342.5	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	**98.5**	0.0	**100.0**
Soya Beans	51.5	2.9	0.0	19.4	9.7	**58.3**	0.0	0.0	9.7	0.0	0.0	**100.0**
TOTAL-all crops	1540.5	**37.6**	0.0	10.4	0.6	3.6	0.0	25.0	0.3	21.9	0.6	100.0

Source: SSSA Eastern Zambia, June 2013

Seed 'to be' Planted and the Sources 'to be' Used, 2013-2014 – All Households (n=124)

		% of total								
Crop	Total kg sowed	Home Saved /own stock	Carryover - Maize Hybrids	Friends, Neighbors, Relatives	Local Market	Agro-Input Dealer	Gov't.	NGO / FAO	Contract Seed Growers	TOTAL %
Maize	3878.0	**42.9**	0.0	6.3	2.2	12.0	**34.7**	1.0	0.5	**99.6**
Millets	0.5	**100.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Sweet potato	0.9	**85.1**	0.0	14.9	0.0	0.0	0.0	0.0	0.0	**100.0**
Groundnut	3235.3	**84.1**	0.0	7.4	3.9	1.2	0.1	2.8	0.0	**99.5**
Common beans	95.0	**39.5**	0.0	15.8	28.9	0.0	0.0	0.0	0.0	**84.2**
Sunflower	354.5	**49.6**	0.0	13.0	6.3	26.8	0.0	2.8	0.0	**98.6**
Cotton	908.0	1.1	1.7	0.1	0.6	0.0	0.0	1.7	**95.0**	**100.0**
Soya Beans	698.5	**31.4**	0.0	24.1	12.9	10.0	1.4	11.5	6.4	**97.7**
TOTAL-all crops	9170.7	**52.7**	0.2	7.8	3.9	7.3	14.8	2.6	10.1	**99.3**

Source: SSSA Eastern Zambia, June 2013

Seed 'to be' Planted and the Seed Sources 'to be' Used, 2013-2014 – Female Headed Households (N=27)

Crop	**Total kg sowed**	Home saved /own stock	Carryover - maize hybrids	friends, neighbours, relatives	local market	agro-input dealer	community-based seed groups	government	NGO / FAO	contract seed growers	Other	TOTAL %
Maize	810.0	**35.5**	0.0	2.8	0.0	3.7	0.0	**58.0**	0.0	0.0	0.0	**100.0**
Groundnut	438.8	**87.2**	0.0	7.1	3.4	0.0	0.0	0.0	0.0	0.0	0.0	**97.7**
Sunflower	45.5	**56.0**	0.0	0.0	0.0	**33.0**	0.0	0.0	0.0	0.0	0.0	**89.0**
Cotton	262.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**	0.0	**100.0**
Soya Beans	95.5	26.2	0.0	**68.6**	5.2	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
TOTAL-all crops	1652.3	**43.6**	0.0	7.2	1.2	2.7	0.0	28.4	0.0	15.9	0.0	**99.1**

Source: SSSA Eastern Zambia, June 2013

Farmer Seed Sowing 2012-2013 Compared to 2011-2012

Crop	Number of HHs	% of HHs			Change sowing quantites for all growing the crop
		MORE	SAME	LESS	average % change
Maize	123	30.1	37.4	32.5	**9.79**
Groundnut	107	26.2	29.0	44.9	**6.91**
Sunflower	28	53.6	32.1	14.3	**59.09**
Cotton	80	6.3	60.0	33.8	***-13.72***
Soya Beans	15	66.7	20.0	13.3	***-19.17***
TOTAL-all crops	**358**	**27.1**	**38.5**	**34.4**	**6.67**

Source: SSSA Eastern Zambia, June 2013

Farmer Projected Seed Sowing 2013-2014 Compared to 2012-2013

Crop	Number of HHs	% of HHs			Change sowing quantites for all growing the crop
		MORE	SAME	LESS	average % change
Maize	122	54.1	30.3	15.6	**45.2**
Groundnut	108	43.5	42.6	13.9	**44.9**
Sunflower	40	70.0	22.5	5.0	**199.5**
Cotton	46	13.0	76.1	8.7	**3.0**
Soya Beans	39	76.9	15.4	7.7	**134.0**
TOTAL-all crops	**364**	**49.5**	**37.6**	**12.4**	**63.5**

Source: SSSA Eastern Zambia, June 2013

Farmers Reason for Planting LESS than Normal in Most Recent (2012-2013) Season

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
No seed available in market	4	3.3%
No seed/cuttings available from neighbors	3	2.4%
Seed access		
No money to buy seed/poor finances or seed too high	33	**26.8%**
Seed quality		
Seed available is not good quality or the variety is not liked	0	0.0%
Sub-total: seed-related	**40**	**32.5%**
NON-SEED FACTORS OF PRODUCTION (limits)		
No/insufficient labor	17	13.8%
Illness/health problems	8	6.5%
No/insufficient land or land not appropriate/sufficiently fertile	11	8.9%
Lack of tools/tractor/ other machinery to farm	1	0.8%
Plant pests/diseases make production not possible	0	0.0%
Animals/predator make production not possible	0	0.0%
Lack of other inputs: controlled water supply/irrigation or fertilizer	8	6.5%
Poor weather/rainfall	18	14.6%
Insecurity (e.g. theft)	2	1.6%
Sub-total: Factors of Production	**65**	**52.8%**
OTHER PRIORITIES/STRATEGIES		
Markets for crop or crop products not well-developed	12	9.8%
Other priorities than agriculture (e.g. have shop)	1	0.8%
Changing Crop priorities or changing agricultural practices	0	0.0%
Other	4	3.3%
TOTAL	**123**	**99.2%**

Source: SSSA Eastern Zambia, June 2013

Farmers Reason for planting MORE than Normal in Most Recent (2012-2013) Season

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
More seed available due to good harvest	4	4.1%
More seed available due to free seed	3	3.1%
Seed access		
More money to buy seed or seed price low	5	5.2%
Got credit to buy seed	0	0.0%
Seed quality		
Have especially good seed or good variety	2	2.1%
Sub-total: seed-related	**14**	**14.4%**
NON-SEED FACTORS OF PRODUCTION (opportunities)		
Good/increased labor	2	2.1%
Feeling strong/healthy	0	0.0%
Have more land/more fertile land	6	6.2%
Have tools/tractor, other machinery to help farm	0	0.0%
Have access to irrigation, fertilizer or other inputs (for example, stakes)	1	1.0%
Good weather/rainfall	1	1.0%
Good security (peace has arrived; less theft)	0	0.0%
Sub-total: Factors of Production	**10**	**10.3%**
OTHER PRIORITIES/STRATEGIES		
Well-developed /new markets for crop or crop products	19	19.6%
Have decided to give more priority to agriculture	41	42.3%
Changed crop profiles or priority to certain crops	0	0.0%
Other	12	12.4%
TOTAL	**97**	**99.0%**

Source: SSSA Eastern Zambia, June 2013

Reasons for not using storage chemicals				
Reason	**Current/most recent season**		**Next season**	
	N	%	N	%
Not available	13	18.8%	9	20.5%
Not necessary (fertile soils)	8	11.6%	8	18.2%
Too expensive	31	**44.9%**	16	**36.4%**
I do not know how to use them	13	18.8%	7	15.9%
Use integrated/ biological methods	2	2.9%	2	4.5%
toxic / noxious	1	1.4%	0	0.0%
Other	1	1.4%	2	4.5%
Total	69	100.0%	44	100.0%

Source: SSSA Eastern Zambia, June 2013

Main Observations – Final Meeting of Entire Seed Assessment Team
24 June 2013, Chipata

- Very few new varieties reaching the farmers in the last 5 years.
- Both Lundazi and Chipata – farmers are using mostly local varieties/own saved seed for maize planting.
- No proper/effective/functioning channels for farmers to access certified seed
  - Farmers also have limited capacity to purchase certified seed (limited demand?)
  - Farmers are currently satisfied with own saved seed.
- Poor grain storage systems – high losses – especially for maize.
- Lower access to FISP inputs in Munyukwa vs Katondo.
  - Significant arbitrage in relation to FISP inputs in Munyukwa.
- There are a lot of seed producer groups using very different systems – and very limited coordination among producer groups and/or use of systematic business plans by producer groups.
- Very limited supply of certified seed for groundnut and soybean – most farmers using recycled seed.
  - Need to assess premium paid for certified seed (by traders and farmers themselves).
  - No clear assessment of demand for certified seed by farmers.
- There is a very high demand for groundnut grain and groundnut seed.
- Lots of farmers shifting out of cotton production into legumes (and sunflower?).
- Lots of seed producer groups, and not enough technical staff overseeing quality of seed production (only 2 SCCI inspectors , and 16 licensed private sector inspectors /serving cotton).
- Both Katondo and Lundazi, farmers are using cotton pesticides for maize grain storage.
- Greater diversity of crop production in Munyukwa vs. Katondo.
- Gender: In both areas, men control production of all crops – women do not have their own land allocations. Men also control the income generated by crop sales.
- In Munyukwa, women are doing much more transformation of crops than in Katondo (millet beer, soy milk, soy cake, sunflower oil, cassava flour milling).
- More female, elderly and/or child headed HH in Munyukwa.
- Big traders are very interested to work with farmer groups, both for input supply and output marketing.
- Big cross-border trade in legumes in Lundazi (Maize from Zambia to Malawi, also soy and cowpeas; beans coming from Malawi to Zambia).
- Maize seed and fertilizer coming from Malawi into Zambia (both formal and informal trade). Fertilizer and maize seed in Malawi is subsidized so price is cheaper than in Zambia and this fosters smuggling.
  - Complaints by farmers and some dealers of “fake seed” or expired seed from Malawi (and elsewhere) being sold cheaply in Zambia.
  - Basic seed of groundnut also coming officially from ICRISAT in Malawi, to Zambia
- Some Lundazi agro-dealers have an organized association and hold annual meeting, but this does not seem to be the case in Chipata.
- Big shortage of certified seed for groundnuts, soy and sunflower and basic seed for g.nut.