SEED SYSTEM SECURITY ASSESSMENT

SOUTHERN MALAWI

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The insights of many people shaped this work: men and women farmers, government ministry personnel, crop and livelihood specialists, local seed producers, seed companies, agro-dealers, traders, agro-enterprise specialists, humanitarian relief personnel, and others. Thanks to all for helping to sharpen the results.

Finally, we do aim for this assessment to lead to practical action in the short and medium-term. The positive opportunities for seed system, marketing and livelihood support in Southern Malawi need to be seized upon soon and with vigor.

Acronymns

ADMARC	Agricultural Development and Marketing Corporation
AISAM	Agricultural Input Suppliers Association of Malawi
ATCC	Agricultural Technology Clearing Committee
CD	Chikwawa Diocese
CIAT	International Center for Tropical Agriculture
CNFA	Citizens Network for Foreign Affairs
CBSP	Community-based seed production
CRS	Catholic Relief Services
DARS	Department of Agricultural Research Services
DiNER	Diversity and Nutrition for Environmental Resilience
DSD	Direct Seed Distribution
HH	Household
IARC	International Agricultural Research Center
ICRISAT	International Center for Research in Semi-Arid Tropics
FAO	Food and Agriculture Organization (also UN-FAO)
FISP	Farm Input Supply Programme
G	grams
GoM	Government of Malawi
Kg	Kilogram
MWK	Malawi Kwacha
MT	Metric Tons
NARS	National Agricultural Research System
NGO	Non-governmental organization
OPOV	One Product One Village
OPV	Open Pollinated Variety
PCI	Project Concern International
SC	Save the Children
SFFRFM	Smallholder Farmers Fertilizer Revolving Fund of Malawi
SSSA	Seed System Security Assessment
SVF	Seed Vouchers and Fairs
TA	Traditional Authority (an administrative unit)
VSL	Village Savings and Loan

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Citation: CIAT, WALA, CRS and Government of Malawi. Seed System Security Assessment, Southern Malawi. October 2011. Blantyre, Malawi: CRS and International Center for Tropical Agriculture.

Comments and updates are welcome by the SSSA team. Please contact the assessment coordinators at l.sperling@cgiar.org and jmkumbira@walamalawi.org.
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EXECUTIVE SUMMARY

A Seed System Security Assessment (SSSA) was carried out across Southern Malawi in October 2011. It reviewed the functioning of the seed systems farmers use, both formal and informal, and assessed whether farmers could access seed of adequate quantity and quality in the short and medium term. The work covered 3 Districts, Zomba, Balaka and Chikhwawa, which were chosen to include a range of agro-ecologies and possible seed security constraints. Field research encompassed: farmer interviews, seed/grain market analysis, consultation with traders, focus group discussions (including discussions with women's groups), and key-informant sessions. Background papers were also commissioned on: a) the formal breeding sector's structures and processes; b) the formal seed sector and fertilizer structures and processes; and c) current decentralized seed multiplication and distribution initiatives.

The rationale for conducting the SSSA at this time was threefold:

- The Southern region of Malawi hosts nine of the ten most vulnerable districts in the country. Food insecurity and malnutrition are rampant. Tailored seed-related responses could help boost production system resilience, food security and overall nutritional profiles.

- There have been repeated seed aid programs in Southern Malawi, every year or every other year for at least two decades. These practices, and the assumptions guiding them, are in need of review.

- Determinations of the seed security situation in Southern Malawi have, implicitly or explicitly, been based largely on food security assessments, or the linking of a production drop (harvest failure) with an implied seed shortfall. Such food-focused tools do not contain a seed security component and most often conclude that a food deficit implies a seed deficit. Targeted, more comprehensive methods now exist to determine the short- and medium-term seed security situation.

For a better understanding of the dynamics of seed security in Southern Malawi, The Wellness and Agriculture for Life Advancement (WALA) has joined with the Government of Malawi (especially its Seed Services) and the International Center for Tropical Agriculture (CIAT) to conduct this assessment. WALA is a consortium funded by USAID to prevent and mitigate food insecurity in southern Malawi. Led by Catholic Relief Services (CRS)-Malawi, it also brings into partnership ACDI/VOCA, Africare, Emmanuel International, Project Concern International, Total Land Care, Save the Children, World Vision, and the Diocese of Chikwawa.

Key findings are summarized below. For a full report, with across-site findings, as well as separate site-by site reports (with tailored action plans), please contact the WALA Agriculture Technical Quality Coordinator at jmkumbira@walamalawi.org

I. ACUTE SEED SECURITY FINDINGS

Multiple and diverse indicators suggest the seed security of Southern Malawi farmers in the short-term is quite stable.

From the farmer point of view, 2010-2012

1. For the 2010-2011 main growing season, farmers sowed 14.2% more seed than the 'normal' amounts in terms of overall quantities sown. In addition, crop by crop, 81.3% of farmers stated that they sowed the same amount or even more than usual. Crop yields also were rated to be generally quite good.

2. Farmers relied on local channels (home saved, local markets, seed from friends or kin) to access about 70% of their seed during the 2010-2011 season. 'Friends and kin' as a source were important primarily for the vegetatively-propagated crops (cassava and sweet potato), which has key implications for how these cuttings might move more widely and quickly.

3. For the 2010-2011 season seed from agro-dealers (17.2% of all seed sown) was accessed uniquely for maize, mustard and cotton. No legumes at all were bought from formal commercial channels within the SSSA sample.

4. For the 2010-2011 main growing season, aid (from government and NGOs) accounted for 12.7% of total seed sown, again with a clear focus on a select group of crops. Notable was that maize aid accounted for 16% of seed sown and groundnut seed aid which accounted for 18.4% of seed sown for this legume. Hence, even though these two crops are the focus of the Farm Input Supply Program (FISP), farmers accessed upwards of 80% of seed for these targeted crops on their own.

5. Local markets were a crucial source for ensuring seed security (31.3% of seed sown) during 2010-2011, but were particularly important in higher stress areas. For instance, In drought-affected Chikhwawa district, 56% of the maize seed and 79% of the pigeon pea seed sown was bought from local markets.

6. The reported plans of farmers for the 2011-2012 main season show more of the positive trend. Almost 90% of farmers plan to maintain or increase the amounts sown across crops, and by significant margins (+27.5%).

7. These positive trends should not obscure the compelling problem farmers face in terms of finances. Cash needs for seed purchase in Chikhwawa illustrate the point. Farmers spent 2049 MWK for the 2010-2011 season and calculate 2795.2 MWK in seed-related cash needs for 2011-2012 (a 36% increase-largely tied to drought-related loss)[1].

8. From the farmer point of view, the rationale for using less seed or more seed (a general proxy for decreasing or expanding land area) is key. During 2010-2011 almost 50% of farmers planted less because of money constraints. Seed availability was mentioned as a constraint by very few farmers (3-5%) and only in reference to select legumes and cassava

[1] At the time, the official exchange rate was approximately 160 MWK to 1 US$

cuttings. The rationale for planting more is also clearcut: farmers expand seed use when they get access to more or better land, and especially in response to emerging commercial opportunities.

On the supply side, 2010-2012

On the seed supply side for 2010-2012 seasons , several findings are to be remarked

9. Agro-dealers themselves indicated no shortage of their normal supplies--- maize, vegetable seed, fertilizer, storage chemicals—to be put on offer. While many in the regions had not yet received stocks from various centralized storage depots at the time of the SSSA, there was no indication that overall supply could not meet farmer demand.

10. For seed supply from formal agro-dealers, other constraints emerged:

    i. geographic access : Farmers cited good access to agro-dealers in only two of the three sites. Those in Mlumbe (Zomba) felt agro-dealer distances from their villages just too far. Extensive analyses of agro-dealer placement in the Central region show similar constraints. For those relying on foot transport, 48% are within a one-hour walk to an agro-dealer shop).

    ii. specific varieties desired were sometimes not on offer (for non-maize) .Agro-dealers in all sites sampled supplied maize and vegetable seed. However, legume seed was seen on offer only tied to the FISP program. This lack is a serious gap.)

11. The seed available on the local market was plentiful. Generally, it was assessed by farmers and traders to be good to normal quality. However, the SSSA team felt quality was especially an issue in the drought-prone region of Chikhwawa (lots of broken and immature seed/grain in the supply).

Community summary:

12. Overall, communities themselves emphasized (via focus groups) that they are 70-100% seed secure across crops (although some are shifting away from maize, due to its repeated failure). Their #1 concern is around money. However, there were isolated but repeated complaints about the difficulty in accessing new and good legume seed (see below, *chronic seed security* issues).

13. Incentives for expanding seed use, and extending land area are especially linked to the emergence of better developed markets for farmer products.

II. CHRONIC SEED SECURITY ISSUES AND EMERGING OPPORTUNITIES

The review of medium-term trends in seed security in Southern Malawi shows some qualified moves forward as well as important and key bottlenecks.

Mixed (qualified) factors: positive and negative

1. New variety access within the survey area has been impressive, with almost 71% of farmers indicating they accessed a new variety in the period 2006−2011. However 78% of these new accessions have been of maize varieties, with negligible gains for the other 9 crops cited.

2. Inorganic (chemical fertilizer) has/will be employed by 80-85% of farmers during the two seasons 2010-2011 and 2011-2012 . Organic fertilizer (compost/manure) during the same period was/will be used by 59-65% of households. Similarly, the majority of households use storage chemicals (57%and 73% for the two seasons). However, for both seasons and all three types of inputs, 75-92% of the applications are associated with maize.

3. At every SSSA site, farmers cited problems accessing new legume varieties (pigeon pea, groundnuts, soybeans and cowpeas). On a positive note, NASFAM packets of beans (which could potentially be used as seed) were on offer in several supermarkets.

4. Some important decentralized seed multiplication was noted during the SSSA, for instance a group in Chikwawa which had multiplied 35MT of pearl millet and 16 MT of sorghum seed. However, no clear markets had yet been identified for this seed supply.

Negative and ongoing stresses

5. There is very little agricultural processing in rural communities – there was production of flours, pastes and beer, but not much more. This means that farmers have been unable to reap the benefits of value addition to raw agricultural products. For instance, the SSSA team identified only a single cassava processor, in Domasi (Zomba region) and this group was supported by external aid.

6. Seed system channels have generally remained static over the least five years, except for maize and vegetable seed.

7. Cassava cuttings are extremely hard to find, except for small quantities moved through social networks (kin, friends, neighbours).

8. There seems to be no formal cotton seed chain in place in Malawi. Some seed is brought in from companies in Zimbabwe. However, much of the seed is purchased from farmers who may also mix varieties. This (lowish?) quality standard poses an issue for a crop with such a high commercial stature. A similar situation seems to exist for rice. No certified seed available. Also very little on offer even in local markets. (NB: in a subsequent discussion, the Department of Agricultural Extension Services in Malawi has indicated that the government

has initiated plans with at least one private sector company to produce seed of adapted cotton varieties for Malawi to address this issue.)

9. Seed aid, that is free distribution of seed as part of emergency response and development initiatives, has been conducted on a large scale, with 64% of the Southern Malawi population having received such aid on average 2.5 times over the five years. Such aid can promote dependency: some households have received seed assistance 6 times in 5 years.

10. Female-headed households do not face very different seed security concerns from male-headed ones. In fact, their sowing patterns are more stable, whereas men's more often fluctuate downwards. No significant seed security-related differences were found among households cultivating different size land areas.

So all in all, this is a highly subsidized, maize focused seed security context. There is very little innovation among the large range of legume crops, which are key for nutrition and soil fertility. There is only modest agro-processing and organized marketing.

RECOMMENDATIONS

The opportunity for the SSSA team to conduct assessments in diverse sites provided the field teams a useful perspective on seed security across regions of Southern Malawi.

Site-specific recommendations have been included in each site report (jmkumbira@walamalawi.org).

Below is a set of 10 key recommendations which are applicable across all sites. These are divided between recommendations for the acute stress (emergency) period as well as those pertaining to medium-term actions.

General Overview

Seed Availability *per se*, was generally not identified as the major problem in any of the assessed sites. Rather access to seed, having the funds to buy seed, was the key constraint (and especially in Chikhwawa). However, it is noteworthy that legume seed of new varieties has been especially hard for small farmers to locate across all areas of the survey.

Most seed security problems encountered in all assessment sites were not short-term ones. Any response in the short term should aim to be linked to longer-term recovery and development. As one example, this might include linking farmers more efficiently to sources of new varieties, especially for the legumes, even in the early recovery phase.

The varied site-specific SSSAs have shown that 'one size does not fit all'. The three sites assessed had different problems and challenges. A blanket response, such as giving free seed, or

conducting standard seed vouchers may not solve problems with the specificity needed. Interventions need to be tailored to specific seed security constraints and opportunities in the different locations. One key factor to consider in this process is the access of local farmers to competitive and reliable sales outlets for seed and other agricultural inputs.

Seed security: immediate responses needed

1. The major urgent problems center around farmers having access to seed (point #1 above). Emergency inventions should be geared to addressing access problems. Vouchers linking farmers to local markets and other innovations are important immediate aid options which give farmers increased access to crops and varieties and other innovations of their choice.

2. Given the specific constraints found in Southern Malawi, we suggest fairs be hosted, but with a specific slant to help bolster diversity and nutrition in a region which is 'maize-rich', but poor in most other agricultural innovations. Newly labeled as DiNER vouchers and fairs (DiNER= Diversity and Nutrition for Enhancing Resilience), we recommend that DiNER fairs aim facilitate farmer access to agricultural elements which are particularly in short supply in the Southern region, including, but not limited to:

    a. New varieties, especially of legumes
    b. Local + traditional crops (vegetables, medicinal herbs)
    c. Fruit trees and other types of trees
    d. Small livestock: chicken, guinea fowl, doves, turkeys, rabbits

Seed security: medium-term responses needed

There is need for a broad-based rethinking on how to improve the seed security of small holder farmers in Southern Malawi. Below, we suggest first set of 'major areas for priority action'.

3. There is a real need to get more legumes into smallholder farming systems. This has to start with the scaling up of Breeder and Basic Seed. While Breeder Seed needs to remain under the direct domain of NARS/DARS, we suggest that Basic Seed Multipliers be diversified to include private as well as public sector actors. Such diversification should result in greater volumes of basic legume seed being produced and at a cheaper cost (including, seed production and marketing by farmer groups).

4. Decentralized seed production needs to become a more strategic and effective force in serving farmers as the formal seed sector will never be able to handle a) the range of crops needed for stress zones; nor b) the range of varieties. At this point, the decentralized seed multiplication initiatives seem to be having very modest (near nil) impact in the Southern Malawi zones. As a general recommendation, sustainable

decentralized seed production models need to be confirmed for Southern Malawi and scaled-up, especially for the legumes and vegetatively-propagated crops.

Tied to #4

4.1 Decentralized seed multiplication groups need to develop an assessment of the cost-effectiveness of their organization and delivery strategy. They should be encouraged to produce only if a) viable markets are identified and b) their own agro-enterprise and marketing skills have been enhanced and c) they have a realistic and robust business plan.

4.2 Links need to be specifically catalyzed to tie decentralized seed producers with continuing and new sources of germplasm.

5. **Cotton seed systems**: There are a number of cotton varieties that have been released in Malawi, and farmers seem to like them. However, at present there does not seem to be any commercial system to produce significant amounts of certified seed of these varieties in Malawi (This issue is explained further in Annex 1.1). The government of Malawi is currently making a major push to promote cotton production. But if this initiative is to be effective, it is very important that simultaneous efforts are made to produce seed of cotton varieties that are adapted to the various agro-ecological zones in which cotton is produced, and that this seed becomes available to the farmers that need/want it on a sustainable basis.

6. **Seed systems for vegetatively propagated crops:** For vegetatively propagated crops, decentralized farmer- based "seed" production systems are probably the most effective (see further explanation in Annex 1.2). In order to ensure broad access and be effective, the producer-groups should be plentiful and well-distributed throughout the target area. They should also be well-trained in how to maintain disease-free populations, be closely linked to reliable sources of new varieties and disease-free parent material (probably research institutions) and each group needs to have a well developed and robust business plan.

7. Delivery mechanisms for giving all farmers regular access to new varieties need to be intensified. Sale through agro-dealers provides only one venue but should be encouraged, especially in small pack sizes (100, 200, 500 g). Sale in regular country stores, open markets (also point #10 below) or even supermarkets (with proper labeling) might be considered. In addition, agro-enterprise groups and seed loan groups (with clear marketing plans) might be formed around seed (point 10 below). In all cases, enhanced delivery options need to be complemented by vigorous media campaigns helping farmers to make informed decisions about whether to use the new materials. This latter process could benefit from the large number of "farm radio" projects and programs that are operating in Malawi.

8. Given that local markets (and their traders) are important for farmers' seed supply, more attention should be given to encouraging that these open seed/grain markets supply the

kinds of potential seed farmers need. As one point of departure, seed/grain traders could be powerful partners in helping to move *new modern varieties* widely, within and among farming communities (linked to point 7). Traders might also be linked to options for safeguarding and improving the quality of seed they put on offer. This could involve: linking traders to credible sources of good quality seed; working with them on techniques of seed bulking; recommending options for separate and improved seed storage.

Ultimately, non-seed issues will drive the seed security sector. Food and livelihood security generally, are linked to the financial capacity of farmers. The last two recommendations focus on needs for: a) generating cash, through Village Savings and Loans (VSL) Programs and b) developing agro-enterprise market chains.

9. **Village Saving and Loan Programs (VSL)**: VSL are described in more detail in Annex 1.3. In a relatively short time (12 – 24 months) the VSL funds are often large enough to allow members to borrow enough money to access key agricultural inputs like seed and sometimes fertilizer or pesticides. In regards to having secure access to seed and other important inputs in the future, VSL should be promoted in order to overcome the most common constraint – which is access to cash among the poor.

10. **Rural agro-enterprises** are mechanisms of potential impact that are currently severely underdeveloped. Farmers are selling their agricultural produce in raw form, or only slightly modified as in the case of maize and cassava, sold as flour. As a start in promoting agro-enterprise development, profitable business models that work for smallholder farmers need to be tested and then scaled-up (see Annex 1.4 for suggestions on methodology). Ultimately, linking smallholder farmers effectively to markets is the best solution to increase incomes and both seed and food security, and also to create the demand that will support crop breeding and private sector production of good seed and/or planting materials of improved crop varieties.

Overall, this SSSA recommends a move away from short-term, gap-filling interventions and towards strategic investment in smallholder –driven variety, seed, and agricultural marketing systems. Simultaneously, it suggests a sharpened focus on food security, which particularly emphasizes crop diversification and nutritional enhancement.

I. INTRODUCTION

Rationale for Report

A Seed System Security Assessment (SSSA) was carried out across Southern Malawi in October 2011. It reviewed the functioning of the seed systems farmers use, both formal and informal, and assessed whether farmers could access seed of adequate quantity and quality in the short and medium term. The work covered 3 Districts, Zomba, Balaka and Chikhwawa, which were chosen to include a range of agro-ecologies and possible seed security constraints.

The rationale for conducting the SSSA at this time was fourfold:

- The Southern region of Malawi hosts nine of the ten most vulnerable districts in the country. Food insecurity and malnutrition are rampant. Tailored seed-related responses could help boost production system resilience, food security and overall nutritional profiles.

- There have been repeated seed aid programs in Southern Malawi, every year or every other year for at least two decades. These practices, and the assumptions guiding them, are in need of review.

- Determinations of the seed security situation in Southern Malawi have, implicitly or explicitly, been based largely on food security assessments, or the linking of a production drop (harvest failure) with an implied seed shortfall. Such food-focused tools do not contain a seed security component and most often conclude that a food deficit implies a seed deficit. Targeted, more comprehensive methods now exist to determine the short- and medium-term seed security situation.

- Finally, the work took place to build assessment capacity. Seed security assessment tools are linked to food security assessments, but are also quiet distinct. The *Seed System Security Assessment* (SSSA) in Southern Malawi was designed to give honed technical insight and to train professionals in fast-evolving seed security assessment and intervention design methods. The training lasted two weeks and involved skill building in analysis of community seed security assessments, seed markets and use of an automated data program to quantify individual household constraints and opportunities.

For a better understanding of the dynamics of seed security in Southern Malawi, the Wellness and Agriculture for Life Advancement (WALA) joined with the Government of Malawi (especially its Seed Services) and the International Center for Tropical Agriculture (CIAT) to conduct this assessment. WALA is a consortium funded by USAID to prevent and mitigate food insecurity in southern Malawi. Led by Catholic Relief Services (CRS)-Malawi, it also brings into partnership ACDI/VOCA, Africare, Emmanuel International, Project Concern International, Total Land Care, Save the Children, World Vision, and the Diocese of Chikwawa.

Aims and Structure of Report

The report presents the results of the SSSA in Southern Malawi during October 2011. It presents the findings on seed security across the three districts, Zomba, Balaka and Chikwawa. While this overview report focuses on the cross-site more global findings, Comprehensive site by site reports are available from WALA Malawi (jmkumbira@walamalawi.org).

In terms of report structure, Chapter II introduces the SSSA methodology and reviews the actual methods used in the October 2011 assessment, including the rationale for the choice of sites. Chapter III provides a brief background to Malawi's formal input sector (plant breeding, seed and fertilizer) and also informal seed sector, including information on how local seed markets function.

Chapter IV presents the main field findings, divided by seed security issues in the acute phase, 2010-2011 season and then honing in on medium and longer-term , chronic stresses and emerging opportunities.

Chapter V presents the recommendations across sites, followed by references.

Appendices post site-by site action plans and give a glimpse into the type of tailored strategies needed in diverse types of stress zones.

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II. BACKGROUND TO SEED SYSTEM SECURITY ASSESSMENT

This chapter presents the necessary background to interpret this SSSA. It introduces the concept of seed security and the different types of seed aid approaches that might be matched to diverse seed security problems (and opportunities) encountered on the ground.[2] Methods used in the September 2011 assessment are then presented.

The Concept of Seed Security

Farm families are seed secure when they have access to seed (and other planting material) of adequate quantity, acceptable quality, and in time for planting. Seed security is best framed within the broader context of food and livelihood security. Helping farmers to obtain the planting materials they need enables them to produce for their own consumption and sale.

Achieving seed security is quite different from attaining food security, despite their obvious links. One can have enough seed to sow a plot but lack sufficient food to eat, for example during the 'hungry season' prior to harvest. Conversely, a household can have adequate food but lack access to appropriate seed for planting. Despite these important differences between food security and seed security, determinations of seed security are normally based, implicitly or explicitly, on food security assessments. This results from a lack of appreciation and understanding of seed security issues.

The Dimensions of Seed Security: a Framework

The concept of seed security embodies several fundamental aspects. Differentiating among these is crucial for promoting those features that foster seed security as well as for anticipating the ways in which such security might be threatened. Table 2.1 outlines the fundamental elements of seed security: seed has to be available, farmers need to have the means to access it, and the seed quality must be sufficient to promote good production.

Table 2.1: Seed security framework, basic elements

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 or other resources to purchase or barter for appropriate seeds.
Quality	Seed is of acceptable quality: • 'healthy' (physical, physiological and sanitary quality) • adapted and farmer-acceptable varieties

Source: Remington *et al.* 2002.

[2] This section draws on Sperling *et al.*, 2008.

Availability is defined narrowly as whether a sufficient quantity of seed of target crops is present within reasonable proximity (spatial availability) and in time for critical sowing periods (temporal availability). It is essentially a geographically based parameter, and so is independent of the socioeconomic status of farmers.

Seed **access** is a parameter specific to farmers or communities. It largely depends upon the assets of the farmer or household in question: whether they have the cash (financial capital) or social networks (social capital) to purchase or barter for seed.

Seed **quality** includes two broad aspects: seed quality *per se*, and variety quality. Seed quality consists of physical, physiological and sanitary attributes (such as germination rate and the absence or presence of disease, stones, sand, broken seed or weeds). *Variety quality* consists of genetic attributes, such as plant type, duration of growth cycle, seed color and shape, and palatability.

In situations of stress, it is rare to have constraints in all three seed security features at the same time. The challenge is to identify the real problem and then target actions to alleviate that problem.

Acute and Chronic Seed Insecurity

Analysis of seed security requires consideration of the duration of the stress: whether it is 'acute' or 'chronic' (recognizing that the divisions are not absolute).

Acute seed insecurity is brought on by distinct, short-lived events that often affect a broad range of the population. It may be spurred by failure to plant, loss of a harvest, or high pest infestation of seed in storage. While in normal times households may have various degrees of seed security, all may be affected by an acute event, such as a flood.

Chronic seed insecurity is independent of an acute stress or disaster, although it may be exacerbated by it. It may be found among groups who have been marginalized in different ways: economically (for example, due to poor, inadequate land or insufficient labor); ecologically (for example, in areas of repeated drought and degraded land); or politically (in insecure areas, or on land with uncertain tenure arrangements). Chronically seed insecure populations may have ongoing difficulties in acquiring off-farm seed due to lack of funds; or they may routinely use low-quality seed and unwanted varieties. The result is households with built-in vulnerabilities.

Acute and chronic seed insecurity often exist together in emergency contexts. Indeed, in cases where emergencies recur − in drought-prone areas, for example − acute problems are nearly always superimposed on chronic problems rooted in poverty.

More Refined Analyses Leading to More Targeted Responses

Table 2.2 gives examples of how identification of a specific seed security constraint should lead to a targeted response, as we are aiming for in this Southern Malawi assessment. So, for example, if 'seed availability' is assessed as the problem in the short term, seed-based interventions, such as seed importation (for acute shocks) may be appropriate. (Seed availability problems rarely persist over the long term.) In contrast, a diagnosis of a problem of 'seed access' might wisely trigger a holistic analysis of livelihood strategies. In the acute phase, providing farmers with cash or vouchers to get their desired seed might be effective. However, an identification of access problems on a chronic basis should lead practitioners to look well beyond seed and seed security constraints. The inability to access certain necessary goods on a repeated basis is usually equated with problems of basic poverty. Initiatives to

help farmers generate income and strengthen their livelihoods would be essential. Seed quality problems, whether they relate to concerns with the varieties or with seed health *per se,* are rarely short-term. Responses usually require significant development programs, linked to plant breeding or seed quality initiatives, depending on the specific constraint identified.

Table 2.2: Types of seed security problems and broadly 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 Agroenterprise 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

Seed System Security Assessment

A SSSA reviews the functioning of the seed systems farmers use both formal and informal. It asks whether seed of adequate quality is available and whether farmers can access it. The SSSA also promotes strategic thinking about the relief, recovery or development vision needed. For instance, during a period of stress, should efforts aim to restore the seed system to its former state, or should they aim to strengthen it? Should efforts focus on crops for food, income or both? Should interventions be linked to crops tied with the most vulnerable (e .g., women)? (see Sperling, 2008 for a description of the SSSA method http://webapp.ciat.cgiar.org/africa/pdf/sssa_manual_ciat.pdf) .

Methods Used

The themes and methods used in the Southern Malawi SSSA are sketched out in Table 2.3. 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: 180 individual farmer interviews, 6 focus group discussions often with 40 people or more, agro-dealer visits across all major chains, and about 15 seed/grain trader interviews.

Table 2.3: Investigative thrusts and methods used in the Southern Malawi SSSA.

Type of Investigation	Commentary
Background information collection	• Plant breeding, formal sector seed supply • Decentralized seed multiplication
Database utilization	Use of GoM databases
Key informant interviews	State government officials, Agro-dealers Civil Society project personnel, Seed producers
Focus group discussions (6) 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=180)	Topics covered: • seed source patterns/ manure-fertilizer use • seed aid and new variety access
Agro-dealer visits (N=9 chains)	• seed types, and other input supplies • business trends; constraints/opportunities
Seed/grain market analysis (N=15 traders)	Assessment of: • crop and variety supplies on the market • sourcing areas and pricing patterns • seed quality management procedures

Household sample

Part of the methodology used in the SSSA did involve conducting quantitative interviews at the household level. Households were chosen without bias by fanning out in diverse directions from a central location point. Every 3rd or 4th household was chosen, (depending on population density).

Of note is that over 1/3 of households designated themselves as 'female-headed'. The SSSA team later found this category not very useful as many households legally headed by men were in practice run by women: men were working off-farm, or not engaged in daily decisions.

Table 2.4: Southern Malawi (HH) sample characteristics (N =180)

Feature	Description	% Sample
Type of HH	Adult headed Grandparent headed	**96.1** **3.9**
Sex of HH head	Male Female	**62.2** **37.8**
Area cultivated	Below ½ acre ½- 1 acre 1-2 acres Over 2 acres	**3.4** **36.3** **29.6** **30.7**

Site Choice

Sites were chosen so as to link the assessment to action, and hence closely followed partner priorities. Figure 2.1 indicates the general location of sites, with Table 2.5 presenting more detailed parameters.

Figure 2.1. Geographic location of SSSA zones, October 2011

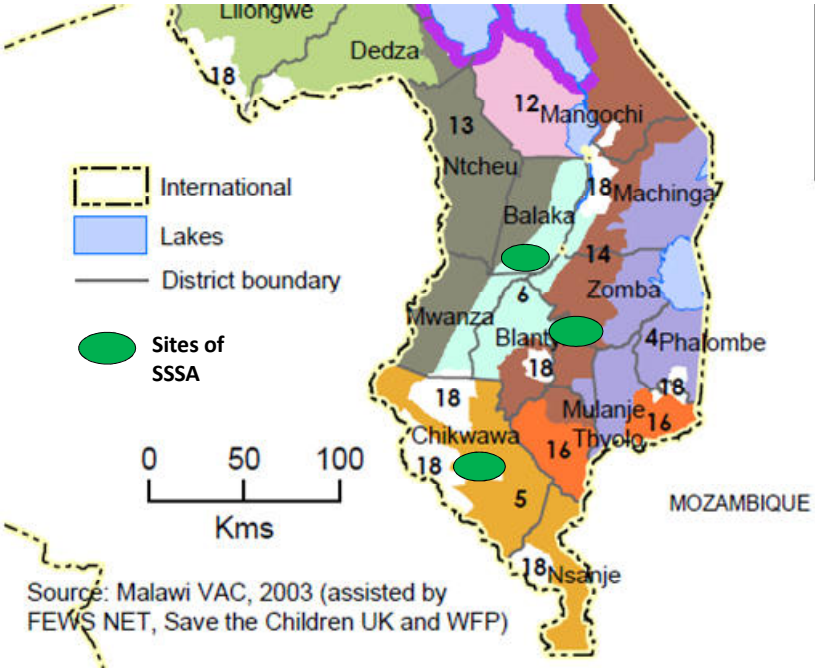


Table 2.5: Select descriptive parameters of sites chosen for assessment.

District	TA	Partner	Agro-ecological	Key crops	Key stresses	Opportunities /agro-enterprise
Zomba	Mlumbe	Save the Children	1000mm-Shire highlands 900m asl	Pigeon pea Maize Groundnuts Cassava Beans Sweetpotato	Erratic rains, Very small land holdings, Army worms-grasshoppers	Pigeon pea-sale (bulking and selling) avocados
Balaka	Kalembo	Project Concern Int'l	Upper shire 800mm max (700 avg) 650 mm asl	Maize Pigeon pea Groundnuts Cotton, chilies Sesame, cassava Sweet potato rice	Long dry spells,small land holdings, wild animals(elephants, hippos), flooding	Pigeon pea-bulking and selling Cotton ginnery
Chikwawa	Maseya	Chikwawa Diocese CRS	Lower shire 600-800mm (avg 450) 70 asl	Sorghum Maize Sweet potato Rice Pigeon pea Cowpeas cotton	drought Floods, Pest outbreaks-maize/rice Small land holding High temp-42 Clya/clay-loam soils	Cotton, Pigeon pea. Cowpea (bulking and selling not value addition) Sorghum-red-for brewing

Seasonal Overview

Of specific note were the seasonal patterns of crop performance around the period of the seed system security assessment, (2010-2011 cropping season). Community focus groups at all three sites suggested that the major stresses centered on maize as dry spells occurred at critical points of tassel to cob formation, with more prolonged drought in Chikwawa. Note that it is mainly with maize that communities assess stress occurring—with poor harvests, season after season.

The stresses were diverse for the other crops. For instance, in Zomba 2010-2011, sweet potato did poorly because of a dry spell, while cassava suffered rodent damage. Goat damage on cassava in Balaka was also mentioned as a major constraint to the crop being grown at all.

Overall, the season of the SSSA was not a particularly stressful one-- except for maize, which is often stressed in this region. Also, the two seasons prior were relatively good ones.

Table 2.6: Community assessment of crop performance over three past seasons

Key crops	2010-2011	2010-2009	2009-2008
Kalembo, Balaka			
maize	x	x	xx
cotton	xxx	xxx	xxx
pigeon pea	x	x	xxx
Mlumbe, Zomba			
maize	x	xx	xxx
pigeonpea	xxx	x	xxx
sweet potato	x	xxx	xx
cassava	x	xxx	x
Maseya, Chikhwawa			
maize	x	x	x
pearl millet	xxx	xxx	xxx
rice	xx	xx	xx

x= poor; xx= average; xxx= good. poor harvests are indicated in red

In these conditions of semi-normality, it is important to note that the Farm Input Supply Program continued to operate at an important scale. For the 2011/2012, the GoM anticipated distributions of 12,000 MT of maize and 4,800 MT of legume seed (see Table 3.6)

III. SEED SYSTEMS IN SOUTHERN MALAWI: BRIEF OVERVIEW

Smallholder farmers use multiple channels for procuring their seed. These channels fall within formal and informal seed systems (with the latter also sometimes labeled as the local, traditional or farmer seed system).

The formal seed system involves a chain of activities leading to certified seed of named varieties. The chain usually starts with plant breeding, and promotes materials towards formal variety release. Formal regulations aim to maintain varietal identity and purity, as well as to guarantee physical, physiological and sanitary quality. Seed marketing takes place through officially recognized seed outlets, either commercially or by way of national agricultural research systems (Louwaars, 1994). Formal sector seed is also frequently distributed by seed relief agencies.

The informal system embraces most of the ways farmers themselves produce, disseminate and procure seed: directly from their own harvest; through gifts and barter among friends, neighbors and relatives; and through local grain markets or traders. Farmers' seed is generally selected from the harvests or grain stocks, rather than produced separately and local technical knowledge, standards, and social structures guide informal seed system performance (McGuire, 2001). In developing countries, somewhere between 80% and 90% of the seed sown comes from the informal seed system (DANAGRO, 1988; FAO, 1998), although this varies by crop and region. Results of this Malawi SSSA show just above 70% coming from local channels in Southern Malawi regions (see Chapter IV, Table 4.1).

What is important to highlight is that farmers themselves obtain their seed through both formal and informal channels, and both merit serious attention. In Southern Malawi, for example, the same small farmers may procure maize hybrids through formal seed systems agro-dealers and even supermarkets, beans from their own harvest or local grain markets, and cassava cuttings from their neighbors.

Finally, as a parallel channel, the development of a 'relief seed system', has become of distinct importance on the supply side in many parts of Africa (Bramel and Remington, 2004), including in Southern Malawi. The Government of Malawi's (GoM) Farm Input Supply Program has been ongoing in some form for at least two decades (Phiri et al., 2004). The FISP has been particularly important for maize and 'a legume'. During the time of the SSSA, GoM was in the midst of planning a major FISP program (see Table 3.6).

Note that such seed aid has become repetitive in many parts of Malawi: it has been given 64% of the seasons since 1992 (see Phiri et al. 2004 for early years). With the random sample of the SSSA, 64% of farmers had received seed aid within the last 5 years, with a mean frequency of 2.5 times each—so half of the time (see Chapter IV, Figure 4.16).

Figure 3.1 shows schematically the formal and informal seed systems (and their component channels) and how they may interact. Adapted from Almekinders and Louwaars (1999), the figure additionally highlights the importance of the local seed market and seed relief channels.

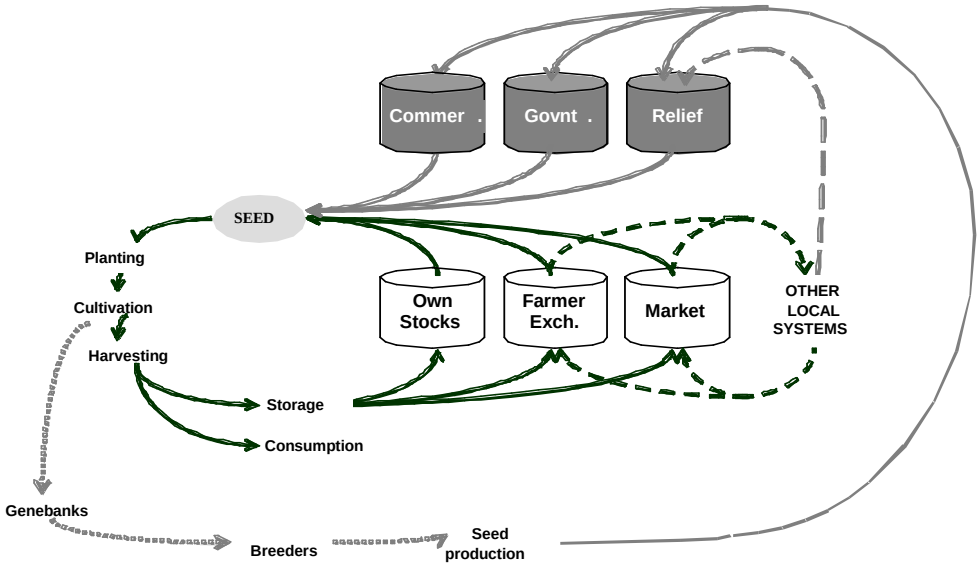


Figure 3.1. Channels through which Farmers Procure Seed. These are depicted by the cylinders: Own seed stocks, exchange with other farmers , and purchase through local grain markets constitute 'informal' channels, while commercial seed stockists, government or research outlets , relief supplies constitute formal channels. The arrows indicate the flow of seed in 'informal' and 'formal' sectors respectively. Adapted from Almekinders and Louwaars (1999).

Table 3.1 also suggests how farmers in one community assess the advantages of accessing seed from each of the diverse channels.

Table 3.1: Malawi advantages and disadvantages of using diverse seed channels : perspective from a community. Mlumbe Zomba, October 10 , 2011

Crop	Seed Source	ADVANTAGES	DISADVANTAGES
Maize	**Own Seed**	-Saves money -Timely planting.	Need for proper storage (Storage Pesticides)
	FISP	-Easy access to improved varieties	-Expired seed is sold due to high demand -Not reliable -Delayed distribution of vouchers -Limited choice of varieties -Labels of packets do not correspond to the contents
	Sharing (friends, neighbors, kin	-Assured of the variety -No need for money -Timely planting	-Not given the required quantities -Not reliable
	Local Markets	-Readily available seed of your choice	-Mixed varieties -Sometimes variety not known -High prices
	Buying from friends/relatives	-Assured of the variety - Possible to buy on credit - No transport costs	Buying of the seed that has been recycled for long
	Agro-dealer	-Wide choice of varieties	**-** Expensive seed - Transport costs
Pigeon peas	Own saved seed	As above	As above
	Friends + relatives	As above	As above
	NGOs	-usually they bring improved varieties	-not reliable; sometimes they just promise without bringing the seed. -some NGOs bring diseased seed especially vegetative planting materials such as banana , sweet potato and cassava
	Local market	As above	-as above
Beans	Local market	As above	As above
	Own seed	-As above	As above
	FISP	As above	As above
	Agro-dealer	As above -usually improved varieties are sold	As above
Cassava & sweet potato	Own seed	As above	-As above
	Sharing	As above	As above
	Buying from friends/relatives/ neighbors	As above	As above

The next sections emphasize a few key points on varieties and seed system structures serving Southern Malawi farmers. The formal breeding and seed sector are first reviewed and then the focus shifts to the informal seed systems and particularly the local seed/grain markets.

Formal Breeding for Southern Malawi

Crop breeding institutions

Crop breeding programs in Malawi follow fairly conventional international approaches. Institutions involved in breeding and the introduction of new crop cultivars include the public sector, the private sector, and International Agricultural Research Centers (IARCs). Table 3.2 lists some of the main institutions from the different sectors

Table 3.2: Indicative institutions involved in crop breeding and/or variety introductions in Malawi.

Public Sector Institutions	Private sector companies	IARCs
• Department of Agricultural Research Services (DARS) • Bunda College (University of Malawi)	• Agricultural Research and Extension Trust (ARET) • Monsanto-Malawi • SeedCo Malawi • Pannar Seed Company • Pioneer Seed Company • Cotton companies (Great Lakes, Malawi Cotton, others) • Tobacco Companies • Tea Research Foundation for Central Africa	• The International Center for Tropical Agriculture (CIAT) • The International Institute for Tropical Agriculture (IITA) • The International Potato Center (CIP) • The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) • The Agro-forestry Center (ICRAF)

Types of improved cultivars that are either bred or introduced in Malawi include: clonal cultivars for vegetatively propagated crops like cassava and sweet potato; line cultivars (pure homozygous lines); open pollinated cultivars (populations of highly selected genotypes); and hybrids (crosses from inbred lines).

Variety introduction

New cultivars are introduced through both public and private sector channels. The variety testing and selection process in Malawi generally follows internationally accepted protocols, and commonly include the following progression:

- Screening and selection of new materials in breeding/observation nurseries (ON);
- Preliminary trials (PT) with promising materials
- Further selection processes in Advanced Trials (AT)
- Multi-location evaluation of advanced materials in national trials (NT), and
- On-Farm testing and evaluation in farmer's fields (OF)

In all cases a new variety has to be tested, evaluated and formally "released" by the national Agricultural Technology Release Committee (ATCC). There are specific conditions for release of new cultivars, which include the following:

- A formal request for release must be submitted to the ATCC with the requisite supporting evidence
- Evidence of the use of conventional research approaches
- Sufficient reliability and replication in the supporting data
- Significant research findings and conclusions and recommendations
- Effective use of data from both inside and outside of Malawi to strengthen the validity of the findings, and
- Clear authentication and ownership of the technology

It should be noted however that the recent signing of a new SADC protocol allows for a streamlined process for the release of new varieties in Malawi if they have already been released in at least two other SADC Member States.

Breeding for southern Malawi

The main food crops for southern Malawi include: Maize, rice, sorghum, pearl millet, pigeon pea, cowpea, groundnut, beans, bambara nut, cassava, sweet potato and cocoa yam. The main cash crops for smallholder farmers include cotton, rice, pigeon pea and groundnut. Where they have access to irrigation, many smallholder farmers also grow vegetables for both income and home consumption

In addition to the national agricultural research station headquarters at Chitedze (in central Malawi near Lilongwe) there are three main agricultural research stations that serve southern Malawi. These are:

- **Bvumbwe** Research Station – located in the Shire Highlands near Blantyre, Bvumbwe is the main research station for horticultural crops (fruits, vegetables), though it also conducts work on other important crops for this agro-ecological zone (AEZ).
- **Makoka** Research Station – located near Zomba, but at a somewhat lower elevation than Bvumbwe, this research station has a major focus on cotton (including cotton variety development and evaluation). It also conducts research on important crops and varieties for this AEZ.
- **Kasinthula** Research Station – located in the lower Shire Valley in Chikhwawa district, this station has a focus on irrigation and rice. However, like the other research stations, Kasinthula also conducts research on other crops that are important in this AEZ. The station also produces basic seed of several crops that it sells to growers that are registered for the production of certified seed, and with some up-grading of its irrigation facilities, it has the potential to produce significant volumes of Basic seed.

In general, the government of Malawi has well trained scientific staff to manage the breeding and variety selection programs for essentially all of the most important food and cash crops.

A list of crop varieties that have been formally released in Malawi since 2000 is given in Chapter III: Annex. It should be noted however, that there are a number of varieties that are not on this list which are still being used extensively in southern Malawi – indicating that quite a few important varieties were released prior to 2000. Examples of some of these crops/varieties include: Maize: SC 403; Sorghum: Pirira 1; Pearl millet: Nyankombo; Groundnut: CG7.

Opportunities for public sector plant breeding in Malawi

The fact that only one (or no) varieties of some important crops (sorghum, pearl millet, cowpeas, soybean, sunflower), and only two varieties of other crops (pigeon pea, groundnut, sweet potato) have been released since 2004 in a country that has such diverse agro-ecological zones (AEZs) as Malawi, suggests that there is considerable scope for enhancing crop improvement efforts for both food and cash crops – especially the vital legumes like pigeon pea, cowpea and groundnut. We also note that variety release conditions often allow for widely-adapted varieties, rather than regionally-specific ones, which would certainly be a disadvantage for some marginal growing conditions of Southern Malawi.

However, increasing efforts on crop improvement would need to be supported by simultaneous efforts to improve the seed production and dissemination systems for these improved varieties. At present smallholder farmers have almost no access to seed of improved varieties of any crop, with maize being a notable exception maize, (along with imported vegetable seed available from agro-dealers).So additional efforts on developing and releasing new varieties – without enhanced systems to facilitate farmer access, would essentially be an expensive exercise without any significant impact on the actual national productivity.

Smallholder farmers do also often obtain seed of improved varieties of cotton. This seed is usually sourced from the large commercial companies that buy the product, and it is usually purchased for cash. Seed of improved varieties of cotton crops is generally *not* available from formal agro-dealers, nor from the local informal markets, and the seed obtained from cotton companies is sometimes mixed in terms of variety or adaptation. Rice seed systems also have considerable challenges (Box 3.1).

Box 3.1 : Is there a system for cotton seed production and dissemination? and what about for Rice?

Cotton

Cotton is a major cash crop for many of the farmers that were interviewed in this assessment. More than 50% of these farmers obtain their seed from the companies that buy and process the cotton crop (e.g., Great Lakes, Malawi Cotton, and others). Another 26% of farmers interviewed indicated that they got their seed from NGOs and/or other subsidized programs.

One of the farmers who was interviewed complained that the seed he got from one of the companies was supposed to be the variety "Makoka 2000", which he likes. However, when he grew it out, it did not look like, or behave like, Makoka 2000. This led the team to look a little more closely at the cotton seed system – and it appeared to look something like this:

- The cotton companies purchase the cotton produced by the farmers they work with
- The cotton companies then separate the seed from the lint, and sell the seed back to the farmers
- Some cotton companies buy cotton from farmers to whom they did not sell the seed, and therefore end up with a mix of different varieties of cotton that they are processing
- This in turn results in the seed being sold by the companies being mixed as well. It is not possible for the cotton companies to maintain seed of pure varieties in this process
- To get around this problem, the government (and some seed companies?) purchase seed of specific varieties from seed companies in Zimbabwe. However, this variety is adapted to all areas of Malawi, and some farmers inevitably end up either with seed of mixed varieties, or seed of a variety which is not adapted to their area.
- There are a number of cotton varieties that have been bred and tested in Malawi and are generally liked by farmers, but seed of these varieties does not seem to be available in the commercial market.

Since the Malawi government is implementing a large subsidy program this year to promote cotton production, and indeed many farmers want to grow cotton as a cash crop, it seems very surprising that there is no well defined system in place to produce and disseminate good seed of adapted and productive Malawi cotton varieties. NB:

Since this assessment was completed, at least one commercial company is working to remedy this situation—so this important issue seems to be receiving some attention.

Rice

Interestingly, a similar situation seems to exist for rice. There are varieties that farmers like and want to plant, and there is some production of basic seed of at least a few of these varieties at Kasinthula Research Station in Chikhwawa district (Basic seed of Pusa, Fire and Kilombero have all been produced there recently). But there was no certified rice seed available in any of the agro-dealers the team visited, and none was encountered in the informal markets either. The farmers who are growing rice in Chikhwawa district indicated that they obtained their seed from their own saved stocks, from friends and neighbors or from the local informal market, only. It may be important consider ways to strengthen the production and dissemination of seed of improved varieties of rice.

Note that while there are some improved varieties of most important food crops, to a large extent these are not being used by farmers, and they are generally difficult for smallholder farmers to obtain. Especially for legumes, farmers rely heavily on their own local varieties for both food and income (see Box 3.2). Cassava, being a vegetatively-propagated crop and subject to infestation by multiple viruses, also had its own special challenges (Box 3.3).

Box 3.2 - Lots of Legume varieties- but not in farmers' hands

Some 29 legume varieties have been released in the period 2000-2010 (see this Chapter III Annex). This includes varieties of groundnut (N=5), Bambara nut (N=3), common bean (N=8), soybean(N=4), pigeon pea (N=6) and cowpea (n=3).

However, follow-up of farmers' access to these varieties shows dismal results. Farmers in the SSSA sample accessed new varieties 223 times in the last five years (2006-2011), yet 78% of their accessions were for maize and only 1% involved legumes! (see Table 4.13).

One might question the value of continuing to breed new varieties--- if they are not arriving in farmers' hands.

Box 3.3 Cassava: how to professionalize 'clean planting material multiplication'—and scale it up.	
Cassava is a critical crop—particularly in areas of stress. When the maize season is bad—farmers turn to cassava (although they may flip back to maize—when rains are promising!) However, cassava has compelling seed security challenges. • Planting material is mainly available through social networks of kin, friends and neighbors. Near nil cutting or stems are found on the open market and NGO programs for multiplication are few, far, and donor dependent. Access to improved varieties is very low. • Challenges are also acute in terms of disease. Experts estimate that 70% of the cassava crop in farmers' fields is infected with Cassava Mosaic Disease *(Makoka Research Station, personal communication*). While some CMD-tolerant varieties have been released (e.g. Sirlira, Gushe, Mulola, NDL690/64) these tend to break down also when disease pressure heightens.	
What do cassava specialists suggest as the way forward?	
Short-term Govt specialists provide advice to NGOs/PVOs on how to buy /procure clean disease resistant planting material. More sensitization with farmers on selecting clean planting material.	Medium term Scale up and train decentralized seed producers—to multiply clean disease resistant material. Engage more NGOs to reach needed scale. Sell cuttings: govt should stop giving them free—again and again !

In summary, while a reasonably good crop improvement infrastructure exists in Malawi, there are still relatively few improved varieties of many important food crops, and in any case, the vast majority of seed planted by smallholder farmers in southern Malawi is not of improved or modern varieties. The seed planted by smallholder farmers in southern Malawi is primarily sourced from their own saved seed from the previous harvest, or purchased from local informal markets. This is true even for maize, which is arguably the most important food crop grown by smallholder farmers in this region. (see section : Informal Seed Systems.).

Overview for Formal Seed and Fertilizer Systems in Malawi

Formal Seed Systems

The formal seed sector in Malawi is regulated by the "Seed Act", and adherence to the regulations is overseen by the Seed Services Unit (SSU), which is a unit within the Ministry of Agriculture, Irrigation and Water Development. The headquarters of the SSU is at Chitedze Research Station near Lilongwe.

Crops regulated under the Seed Act include: Maize, wheat and sorghum, soybean, common bean groundnut, pigeon pea and cowpea, and tobacco.

Some vegetatively propagated crops are also regulated to a lesser degree. These include potato, sweet potato and cassava.

After breeder seed is multiplied, foundation seed proves key for catalyzing the process of further seed production, and ultimately getting varieties out to farmers. As in many other countries, foundation seed

production in Malawi rests with the government and the various branches of the national agricultural research system. However, in comparison to the urgent need, and especially to scale up the legumes, production volumes of foundation seed are low and costly (see Box 3.4).

Box 3.4 Foundation seed: alleviating the bottleneck—especially for the legumes. Move to decentralization!

NARS/DARS are the prime multipliers of foundation seed in Malawi. Recently, on a smaller scale, ICRISAT has helped with multiplication of some groundnut foundation seed, while the private company Demeter has been given permission to multiply maize and several bean varieties (for the latter, 3 out of the 20 released). However, the demand for foundation seed—in order to produce certified seed to meet farmers' annual needs—greatly exceeds supply. The shortage of foundation seed across numerous crops is preventing the production of certified seed every year.

For legumes, much of this original high quality seed goes directly into the Farm Input Supply Program (FISP) which does give smallholder farmers some punctual access, especially to groundnut, pigeon pea and common bean (with cowpea, to a lesser extent) seed . The FISP has provided 3000-5000 MT of legume seed in the last few years.

However, there is a real need to scale up legume seed production: farmers want access to new varieties, and on a continuing basis. Legume varieties can also be key for promoting nutrition and for enhancing soil fertility. The current supplies of foundation seed also cannot begin to meet farmer need or farmer demand.

The issue is how to make foundation seed more available—so as to jumpstart abroad-based decentralized production. One very good option would be to allow further private seed companies to produce such foundation seed, under guidance by government authorities. Such a diversified producer strategy would allow for the scaling up of foundation seed production—and quickly. Calculations also suggest that production costs would drop steeply. For common beans, from the current $ US1.20/kg---to $0.40/kg (forty cents) which is 1/3 the current price!).

Below, we highlight but three issues key to the development of formal seed systems which can better serve Malawi smallholder farmers: certified seed, agro-dealer placement, and the FISP program.

Certified seed

The general processes for the production and dissemination of certified seed are given in Table 3.3.

Table 3.3: Seed Value chain for major crops

Main Component	Sub-Component	Actors
Research	Breeding	DARS, Universities, International Agric. Research Institutes (IARC)
	Agronomy and protection	DARS, Universities, IARCs
Variety release	Variety registration	ATCC, DARS, Seed houses, other research institutions
Pre-certified seed production	Breeders seed	Researchers, Conglomerate seed houses
	Foundation seed	DARS, ICRISAT (groundnut), Demeter (maize and beans), seed houses, ASSMAG
Certified Seed	Basic Production	STAM members, free-lance SME farmers, MASA
	Processing	Select seed houses, SME's
	Retail	Agrodealer associations (eg AISAM, RUMARK) seedhouses, ADMARC, supermarkets, MASA

From V. H. Kabambe, Assistant Professor, Bunda Agricultural College, University of Malawi. Oct 2011

Certified seed is monitored by the SSU for seed source; land rotation history; isolation; trueness to type; field pests; purity and germination percentage. Contract growers must clean and sort seed in order for it to be certified. Some of the organizations that are involved in the production and distribution of certified seed and other planting materials are listed in Table 3.4.

Table 3.4: Growers and traders of seed by crop and cultivar type

Crop type	Producers and sellers
Maize hybrid	Monsanto, SeedCo, Pannar, Chemicals and Marketing, Funwe Farms, SeedTech
Maize OPV's	Pannar, Chemicals and Marketing, Demeter Farms, Funwe Farms, Panthochi Seed Farm, ASSMAG
Wheat	SeedCo,
Rice	ASSMAG
Sorghum	ASSMAG
Groundnuts	Funwe Farms, Panthochi Seed Farm, ASSMAG, Peacock
Soybeans	SeedCo, Funwe Farm, ASSMAG,
Pigeon peas	Funwe Farms
Beans	SeedCo, Funwe Farm, Demeter, ASSMAG
Cowpea	Demeter, Funwe Farm,
Cassava	Funwe Farm, ASSMAG
Agro-forestry trees	ASSMAG, Land Resources Center, Total Land Care
Sweet potatoes	Funwe Farms, ASSMAG

From V. H. Kabambe, Assistant Professor, Bunda Agricultural College, University of Malawi. Oct 2011

A number of recent initiatives have been developed within the last five years to quickly scale up the production of certified seed, including, *inter alia* , Tropical Legumes II (funded by the Bill and Melinda Gates Foundation), Malawi Seed Industry Development Project (funded by Irish Aid), a common bean-linked project (support by the McKnight Foundation), initiatives by FANPAR. However, the scale is still modest in relation to demand, and much of this certified seed is given free under the umbrella of Farm Input Support Program. Initiatives which develop ongoing and sustainable seed production programs (non-subsidized!) are very much needed.

Agro-dealers

Efforts by the Malawi government as well as international donors have been made to increase the number and quality of private sector retail outlets for agricultural inputs (referred to in this paper as "agro-dealers").

The main government outlet for seed and other agricultural inputs is called ADMARC. There are also two non-governmental organizations that have worked on increasing the number of agro-dealers and they include CNFA and AISAM (Agricultural Input Suppliers Association of Malawi). Note that an analyses of agro-dealer placements shows that their network may be growing, but that many farmers are still out of reach from a convenient, reliable store (see Box 3.5) . For efficient and equitable formal sector delivery, agro-dealer placement remains a key issue.

Box: 3.5 WHO has access to agro-dealer retail shops?

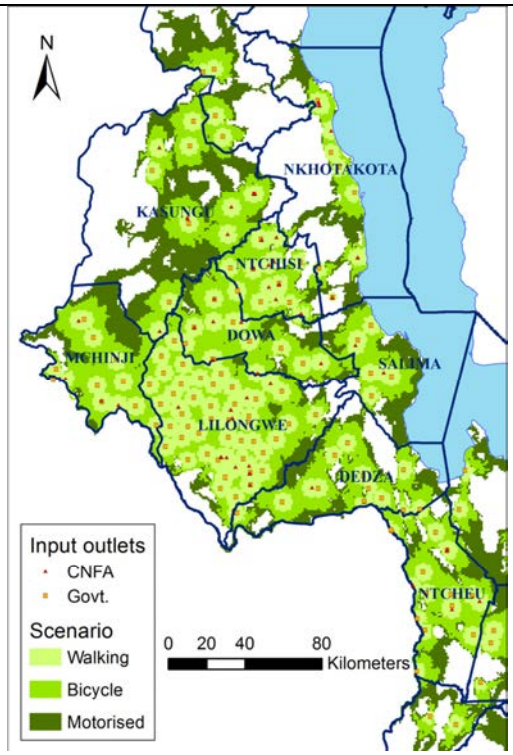
The placement of agro-dealer shops largely determines if farmers can get access to certified seed and select new varieties. Logically, for business purposes, agro-dealer placement tends to favor town and urban centers, that is, areas of higher population density—and more potential customers.

So how well are more rural Malawi farmers served by the placement of agro-dealer shops? One recent analysis mapped the placement of the CNFA (Citizens Network for Foreign Affairs) shops in the Central region of Malawi.

The work was based on the question of: 'what percent of farmers have access to an agro-dealer shop within one-hour trip?' The results showed that farmers were generally okay *if* they had access to a car or bicycle.

But less than half the population (48%) could get to retail shop within one hour--- if traveling by foot. So it is the poorer farmers with the least access!

Note that the central region is much better served than the South— which is the focus of this SSSA. The south has more heterogeneous terrain and fewer tarmac roads. It is also more economically disadvantaged.



source: Farrow et al., 2011

Figure 3.2 . Areas within one hour of CNFA and government stockists

Farm Input Supply Program (FISP)

The network of retailers, as well as the outlets run by seed companies themselves, has been largely responsible for the government sponsored Farm Input Supply Program (FISP). FISP is an input subsidy program that works by distributing vouchers for seed and fertilizer to smallholder farmers. These are redeemed at agro-dealer shops across the country. FISP provides seed at no cost (5kg hybrid maize or 7.5 kg OPV maize); 2 kg of legume seed (farmers chose from soybeans, beans, cowpea , groundnut or pigeon pea). It also provides a 50 kg bag of urea and/or compound fertilizer for MWK 500.00 (about US$ 3.25 per 50 kg bag). Lastly, vouchers for grain storage chemicals are also included in FISP. Information from the field studies suggested that different farmers received different components of the input package rather than the whole package of inputs altogether (e.g., some farmers received seed while others received fertilizer vouchers, etc.). The volumes of seed of different crops distributed through the FISP program between 2008/9 and 2010/11 are given in Table 3.5 (maize) and Table 3.6 (legumes).

Table 3.5: FISP subsidized maize seed sales 2006/07 to 2010/11

	Coupons redeemed	Hybrid (mt)	OPV (mt)	Total maize (mt)	% Hybrid
2006/07	1,828,982.00	2,767.00	1,757.00	**4,524.00**	61.16
2007/08	2,121,647.00	2,944.40	2,597.50	**5,541.90**	53.13
2008/09	2,569,087.00	4,532.00	833.00	**5,365.00**	84.47
2009/10	1,614,070.00	7,619.00	1,033.00	**8,652.00**	88.06
2010/11	1,988,066.00	8,521.00	2,129.00	**10,650.00**	80.01

source: Logistics data unit in Kabambe and Mhangp, 2011

Table 3.6: FISP Subsidized legume seed sales 2008/09 to 2010/11 (MT)

Season	Crop					
	soybean	Beans	Groundnut	Pigeon pea	Cowpeas	**Total**
2007/08	23.78	-	-	-	-	**23.78**
2008/09	-	0.09	0.01	0.22	-	**0.32**
2009/10	644.96	341.22	396.57	1.34	6.44	**1,390.53**
2010/11	375.04	316.49	2,029.46	4.16	1.62	**2,726.77**

source: Logistics data unit in Kabambe and Mhangp, 2011

The planned distributions of seed, fertilizer and storage chemicals (in metric tons) under the FISP in 2010/2011 and 2011/2012 are as follows:

Table 3.7: Planned distributions of seed, fertilizer and storage chemicals (in metric tons) under the FISP in 2010/2011 and 2011/2012

Item	2010/2011	2011/2012
Fertilizer: NPK	80,000	80,000
Urea	80,000	80,000
Maize Seed	8,000	12,000
Legume Seed	3,200	4,800
Storage Pesticides	500	500

source: 2010. Government of Malawi. A Medium Term Plan for the Farm Input Subsidy Programme (2011 – 2016). Third version. Ministry of Agriculture and Food Security. PO Box 30134, Malawi.

It has not been possible to obtain accurate estimates of the volume of seed of improved varieties of different crops produced and/or sold in Malawi in recent years. However, total national *projected seed demand* for different crops is presented in Table 3.8.

The prices of certified seed in October 2011 were as follows (MWK = Malawi Kwacha. Approximately MWK 160 = US$ 1.00): maize OPV MWK 266/kg; maize hybrid MWK365-400/kg. Groundnut, beans and soybean seeds were all at MWK 407.5/kg. In the FISP, seed sales are through a coupon system. In the 2010/11 season, beneficiaries were given one coupon that could be redeemed for either 5 kg of hybrid maize seed, or 7.5 kg of OPV maize seed. Both seed packages were valued at MWK1,650. Companies were allowed to add a discretionary fee of not more than K100.00 to the subsidized seed, but otherwise the farmers paid nothing.

From discussions with smallholder farmers and other key informants, it does appear that a) there is much more maize seed produced and sold commercially than seed of any other crop and b) that there is relatively little commercial production and sale of legume crops, and most of what is produced is marketed through the FISP. Figures on the seed and other input distribution targets of FISP are given above, and other data suggest that the government was successful in meeting and/or slightly exceeding these targets in the 2010/2011cropping season. It also appears likely that there are significant volumes of commercially produced maize seed that are sold outside of the FISP.

Table 3.8: Projected national seed demand for hybrid, OPV and Local maize and other main crops in Malawi, 2006/07-2010/11 for small holder farmers, based on area planted and given seeding rates.

Season	**Crop**	**Seed rate Kg/ha**	Total seed demand (MT)
			National
2006/07	Maize – hybrid	25	12,790
	Maize-OPV	25	14,994
	Maize-Total	**25**	**42,161**
	Groundnuts	90	24,147
	Soybeans	100	7,946
	Pigeon peas	16	2,584
	Beans	80	21,495
2007/08	Maize – hybrid	25	12,912
	Maize-OPV	25	12,808
	Maize-Total	**25**	**34,183**
	Groundnuts	90	13,719
	Soybeans	100	1,461
	Pigeon peas	16	4,094
	Beans	80	23,324
2008/09	Maize – hybrid	25	-
	Maize-OPV	25	-
	Maize-Total	**25**	**37,912**
	Groundnuts	90	20,034
	Soybeans	100	4,419
	Pigeon peas	16	2,350

	Beans	80	21,091
2009/10	Maize – hybrid	25	12,943
	Maize-OPV	25	11,494
	Maize-Total	**25**	**36,810**
	Groundnuts	90	25,039
	Soybeans	100	7,065
	Pigeon peas	16	3,047
	Beans	80	23,110

* Source: Kabambe and Mhango – Consultants' Report, September 2011

There are other input supply programs that subsidize agricultural inputs like seed and fertilizer. Some of the main programs include ASWAP (the Malawi CAADP Implementation Plan); the Irrigation, Rural Livelihoods and Agricultural Development program (IRLAD) supported by the World Bank, IFAD and the Government of Malawi ; Green Belt; and some additional programs operated independently by NGOs. However, the total amount of seed and fertilizer distributed through these programs is relatively small when compared to the FISP.

In conclusion, the amount of certified seed produced and sold in Malawi for all crops is far below the total volumes of seed that are sourced and planted by farmers every year (this includes maize). However, it is not clear how much demand there would be from smallholder farmers for seed of improved varieties of food and cash crops, even if it was available.

Also, it appears that the large seed production firms are primarily focused on supplying the large input subsidy programs, rather than on developing their own networks of retail outlets.

And lastly, it would appear that there is relatively little production of certified seed of self-pollinating crops like sorghum, pearl millet and the legumes by the commercial seed industry and an alternative decentralized approach to seed production and marketing for seed of these crops (and vegetatively propagated crops) might be an effective alternative approach.

Fertilizer

There is no commercial fertilizer production in Malawi. It is all imported, primarily from South Africa, Asia or the Middle East. Some compound fertilizers are blended in the country by OPTICHEM and the Malawi Fertilizer Company. The main types of fertilizer and crops for which they are recommended are given in Table 3.9.

Table 3.9: Main types of fertilizers available in Malawi and crops for which they are recommended

Fertilizer Type	USES
23:21:0+4S	Maize, wheat, sorghum improved varieties, pearl millet improved varieties, finger millet, rice, sunflower, soybean, common beans, potatoes, cotton
CAN	Maize, sorghum improved varieties, finger millet, wheat, tobacco, sunflower, soybean, common beans, cotton, sugarcane, rice, potatoes
UREA	maize, sorghum improved varieties, finger millet, pearl millet improved varieties, rice, wheat, tobacco, sunflower, soybean, common beans
Compound A to D	Tobacco, chilies
Sulphate of Ammonia	Rice, cotton

From V. H. Kabambe, Assistant Professor, Bunda Agricultural College, University of Malawi. Oct 2011

Organizations involved in the importation and distribution of fertilizer include:

- ADMARC (government)
- SFFRFM (government)
- Private sector companies: Farmers World, Rab Processors, Agora, Agricultural Resources Ltd (formerly YARA)
- small-scale agro-dealers supported by CNFA and/or AISAM

The amount and value of fertilizers imported into Malawi from 2006 to 2009 are given in Table 3.10. It is generally assumed that the amount of fertilizer imported into the country each year is sold and utilized by farmers – though it is not clear if this is entirely true.

Table 3.10: Fertilizer import value and quantities (tons) imported to Malawi from 2006-09

Type of Fertilizer	**2006**	**2007**	**2008**	**2009**
***Import value* (x1000US$)**				
Nitrogenous	33315	101552	228664	90709
Phosphate	68	70	635	200
Potash	2239	129	1380	5331
Total import value	35,622	101,751	230,679	96,240
***Quantity imported* (tons)**				
Nitrogenous	33595	59650	66990	60985
Phosphate	10580	7127	12643	20606
Potash	10682	1157	9423	13822

Source: www.faostat.org

The current prices for maize fertilizers is approximately US$43 per 50 kg bag (1US$=MWK160). Tobacco fertilizers are slightly less expensive at US $ 40 – 60 per 50 kg bag. When farmers purchase a bag of maize fertilizer using a voucher from FISP, they have to pay only MWK 500 (roughly US$ 3.25) at present.

Since land holdings in Malawi are so small, and the farmers depend to such a large extent on their production for food and income, it is somewhat surprising that the use of commercial fertilizers by smallholder farmers remains relatively low. Recent visits to agro-dealers in southern Malawi indicate that commercial fertilizers are generally available, but again, retailers report only a small demand by smallholder farmers, and a significant percentage of the existing demand is generated by the input voucher schemes.

Informal Seed Systems in Southern Malawi :

The informal system is the major seed procurement system across crops in Southern Malawi, except for the highly commercial ones such as cotton and horticultural vegetables. Hence for the sorghum/millets, all legumes (groundnut, pigeon pea, beans, cowpea), vegetatively-propagated crops, and even for maize, the informal seed system is key and provides 70%+ of the total seed sown. The informal sector includes all the ways farmers themselves produce and disseminate seed: through own stocks, via barter/gifts and through local markets.

Local markets, in particular, serve as the backbone of seed provision during and after seasons of stress in Southern Malawi. Simply, due to poor harvests, farmers are forced to access a larger portion of their seed off farm and in local markets. For example, in the main season 2010-2100, farmers accessed 31.3% of their seed from local markets and in the 2011-2012, figures were projected at 27.6% of total seed sown, as the former season was a good one (Chapter IV, Tables 4.1, and 4.4). Supporting and strategically strengthening such markets would be key for promoting seed security across a range of smallholder farmer sites. The next section on Informal Seed Systems focuses on how local seed/grain markets work.

Seed/grain markets

'Seed/grain markets' refer to a diverse set of actors and institutions, from open-market traders to permanent village shops to long-distance truckers, who buy and sell crops for consumption and, potentially, for seed (Sperling and McGuire, 2010). To be clear, much that is sold in local markets is used for grain (for consumption, for livestock feed, for brewing). However, there is a special subset of this grain which can potentially also be used for seed and which is actually sown.

Distinguishing seed from grain

Both farmers (buyers) and traders (sellers) use a range of strategies to access 'good' seed from the markets. For the buyer, he/she wants to maximize the possibility that the product bought will actually grow on his/her own farm. For the seller, he/she wants to tap into a lucrative seed market, whose prices prove higher than those obtained from routine food grain alone. Box 3.6 gives broad overview of how farmers and traders strategically manage their stocks of 'potential seed', that is, grain which can usefully be planted. Table 3.11 gives an idea of frequency of each management practice traders use to distinguish seed from grain, from a SSSA sample of traders interviewed. There are six different practices which over half of the traders interviewed regularly use to encourage a better product.

BOX 3.6 : MANAGING ' POTENTIAL' SEED

Open markets serve as an important source for farmers' seed. While these are commonly referred to as 'grain' markets, farmers and traders exercise considerable agency in managing and selecting among grain supplies to ensure that some can be used as 'potential seed'.

Traders don't sell just anything

Traders aim to sell a high quality product and clearly recognize that some of their stocks will be used as seed: prices do double around planting time for 'potential seed' .

Here is how (some) traders manage potential seed:

- produce is first assessed; if clean, kept for seed;
- varieties are kept separate
- best varieties have different prices
- twigs, stones, broken seed re moved
- protective chemicals used in storage to minimize damage

Farmers don't plant just anything

In scouting out potential seed from markets, farmers seek out varieties they know. They further screen for visible quality traits: are the grains mature? are they not damaged by pests? Farmers may also buy potential seed within a larger grain batch and make the refinements for 'seed' at home, sorting out the non-seed trash (the twigs, pebbles, sand,-broken grains).

As important as the product is the provider. Farmers try to buy planting material from people they trust—sellers who will tell them the origin, so as to know if the material is adapted--- and sellers who will be held responsible—if the planting material proves sub-standard.

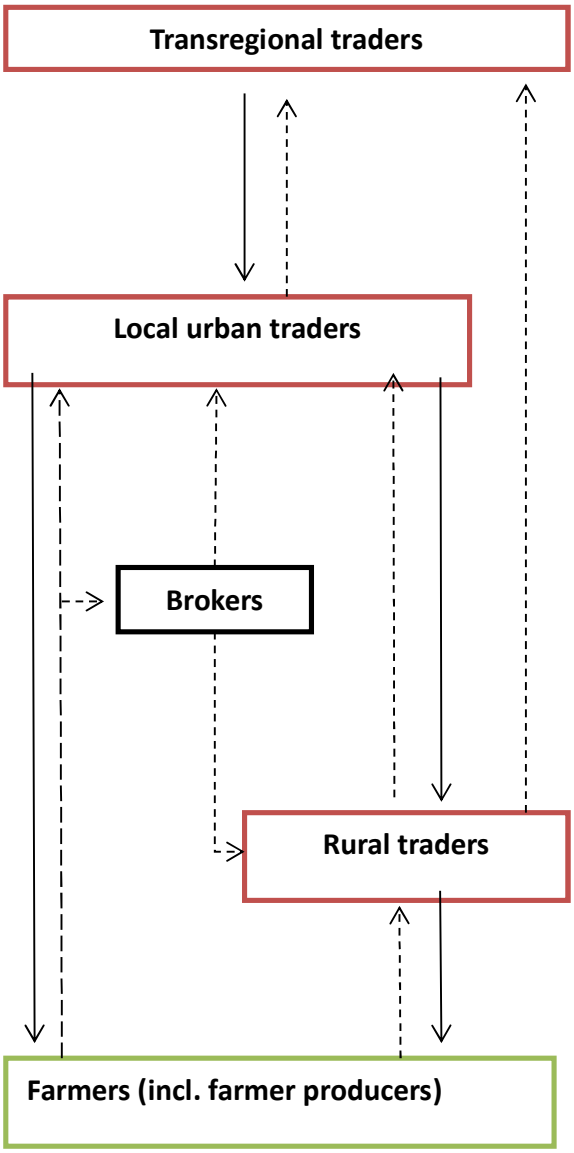
Table 3.11: Trader practices in managing potential seed, SSSA sample, October 2011

	% of answers 'yes'										
N=37	*Get grain from spec regions*	*Seek out varieties*	*Buy from spec growers*	*Keep vars pure*	*Keep fresh harv stocks*	*Grade stocks*	*Germ tests*	*Special storage*	*Sort out waste*	*Sort out bad grains /seed*	*Sell seed + grain separ-ately*
	68%	**65%**	**41%**	**81%**	**78%**	**24%**	**5%**	**38%**	**95%**	**92%**	**5%**

Distinguishing among traders : general structure of seed/grain markets

One trader is not like another, and in trying to chart how seed markets function, it is important to understand key differences. For instance, traders who have large, reliable trucks and storage facilities define their supply territory differently from local sellers who may produce their own seed and travel to market by bicycle or donkey.

Figure 3.3 gives a general overview of key traders (market actors) in Southern Malawi. Scales of operation, and the assets they possess, prove to be the key distinctions amongst these different actors. Starting at the bottom (or at the grassroots), farmers sell their harvest either directly to traders (in rural areas, or sometimes, in towns as well) or to brokers. Brokers are engaged by a trader – particularly after good harvests – to buy from farmers directly, or from smaller traders. These brokers vary in expertise, from off-duty taxi drivers transporting between field and shop, to more specialized agents who supply shops from other regions. Also, some farmers perform the broker role themselves, and bring produce of several farms for sale to urban or rural traders. While urban traders have more capital assets, and more extensive supply networks than rural trader shops, both types of traders can buy directly from farmers – this can be important for some traders to guarantee provenance. Clear assurances of provenance also tend to come from open-market traders, who sell small amounts of potential seed at planting time, often well-sorted and selected, which is sourced from their own production or from neighbours. Finally, trans-regional traders move seed/grain longer distances, and have the greatest capacity for storage and ability to engage in price arbitrage. At sowing time, these flows reverse.



- Traders with significant capital
- Extensive storage facilities
- Transport by trucks
- Cross border trade
- Buy at harvest and sell at sowing time

- Often enough capital to buy larger volumes
- Storage in bags on floor
- Purchase directly from farmers or rural traders
- Have own transport or use brokers
- Some are smaller open market stands

- Middlemen, often taxi-bus drivers
- Little money, score a marginal profit
- Buy from farmers or local rural traders
- Used mostly after a good harvest

- Low capital
- Storage in bags on floor
- Typically no transport of their own
- Send blokers after good harvest
- Farmers come and sell after bad harvest

Figure 3.3. Seed/grain flow between actors. Broken lines represent harvest and full lines represent sowing time.

Potential seed and price

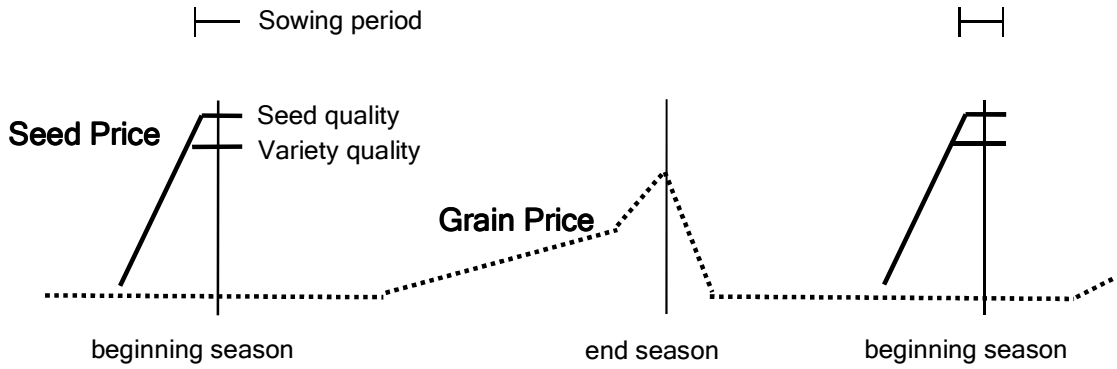
The price of products also signals how grain may be distinguished from seed .

During non-sowing periods, grain and potential seed remain relatively undistinguished in terms of price. However, during sowing periods, extending some four to eight weeks prior to planting, two trends can be observed. First, prices spike for the most sought-after varieties for sowing, that is, for the varieties that are most adapted, productive or which give the highest income return (i.e. those which could be used as potential seed). In areas of high stress, where few varieties may perform at all, prices between

desired and non-desired varieties can differ by as much as 25-50%. Second, around planting time, traders may distinguish among batches of the same variety which are 'well sorted and stocked' from batches 'less well sorted and stocked', adding a price premium (≈ 5%) for the cleaner materials which presumably demand less labor to prepare for sowing. So sometimes prices reflect the differences between seed and grain in terms of 'varietal quality', and sometimes reflect the differences in terms of 'seed quality'. Farmers who pay these price premiums are undoubtedly buying seed *per se*.

Seed-related prices, unlike grain prices, do not rise during the hunger gap periods (and immediately pre-harvest) so the patterns of price rise and fall are quite distinct for seed and grain. Figure 3.4 conceptually suggests these price trends. The pattern below is sketched mainly for didactic reasons: grain price trends, in particular, may be highly variable by environment and time period. [3]

Figure 3.4. Trends in crop and seed prices in local seed/grain markets through the season, showing seed price peaks at sowing time and grain price peaks before harvest. Seed price differential takes into account variety quality (for the most sought-after varieties), plus sometimes additional seed quality features (i.e. a price premium for well-sorted stocks).



Actual field findings on market functioning appear in the next Chapter IV. These also include findings on how the local seed markets functioned 2010-2011 and 2011-2012. As a glimpse, seed supplies were available and the quality, overall 'normal' or 'good'. However, the SSSA team hand select concerns about some of the market seed put on offer in Chikwawa. A localized drought translated into less overall supply, but also trader hoarded the really good planting material—until prime sowing period.

Salient points : Formal and informal seed systems in Southern Malawi

Plant Breeding

1. Across crops, some 147 number of varieties have been released in Malawi in the period 2000-2010.
2. Only one (or no) varieties of some important crops (sorghum, pearl millet, cowpeas, soybean, sunflower), and only two varieties of other crops (pigeon pea, groundnut, sweet potato) have been released since 2004 in a country that has such diverse agro-ecological zones (AEZs) as Malawi.

[3] This section on price draws from Sperling and McGuire, 2010

3. Variety release conditions often allow for widely-adapted varieties rather than regionally-specific ones, which is certainly be a disadvantage in marginal growing environments of Southern Malawi.
4. Any Increased efforts on plant breeding need to be supported by efforts to improve seed production and delivery. Within the SSSA sample (n=180) farmers had accessed new varieties 223 times in the last five years. However, 78% of the accessions were for maize. Only 1% involved legumes.

Formal Seed Sector.

5. Foundation seed production is currently concentrated in the NARS/DARS domain. Such seed production needs to be scaled up dramatically to meet demand and to allow for a dynamic decentralized seed multiplication system. Foundation seed producers might usefully be diversified to include a greater range of private sector partners. Such decentralization can help raise foundation volumes quickly and significantly decrease costs of production (by 2/3 the cost for the cases of select legumes).
6. There are weak or non-existent seed systems for three key crops. Each needs focused attention:
    a. The Cotton seed system;
    b. The Rice seed system;
    c. The Cassava planting material system

7. The Farm Input Supply Program uses up the big proportion of formal sector seed, including nearly all the legume seed. Further, farmers with vouchers may sometimes be able to access groundnuts, pigeon pea and common beans via the FISP, but find it very difficult to locate any of the other legumes (soybean, cowpea).
8. Agro-dealer placement is sufficient for those only with motorized transport or bicycle. Geographic Information System (GIS) mapping in the Central region of Malawi showed only 48% of the population able to get to a retail shop within one hour if traveling by foot.

Informal Seed Sector

9. The informal system is the key one across crops in Southern Malawi, except for the highly commercial crops such as cotton and horticultural vegetables. For the sorghum/millets, all legumes (groundnut, pigeon pea, beans, cowpea), vegetatively-propagated crops, and even for maize, the informal seed system provides 70%+ of the total seed sown.
10. Local markets, in particular, serve as the backbone of seed provision , especially after seasons of stress. Due to poor harvests, farmers are forced to access a larger portion of their seed off farm and in local markets. For example, in the main season 2010-2011, farmers accessed 31.3% of their seed from local markets and in the 2011-2012, figures were projected at 27.6% of total seed sown (as the former season was a good one).
11. Traders strategically manage their stocks of 'potential seed', that is, grain which can usefully be planted. Within the SSSA sample, the majority of traders regularly used six distinct practices to manage seed so as to arrive at a better.
12. Given that the informal sector is an important force, opportunities for strengthening and professionalizing it further should be pursued. This might include explicit actions: to introduce new varieties, raise seed quality and promote even more specialized seed trade.

Chapter III: Annex . Crop cultivars released in Malawi between 2000 and 2010, by crop

Crop	Variety	Type	Source	Yield potential	Region of adaptation	Date of release
Maize	MH 28	Semi-flint hybrid	NMBP	9000 kg/ha	Mid-altitude areas	2008
	MH 29	Flint hybrid	NMBP	6,000kg/ha	Low- mid altitude areas	2009
	Chitedze 5	OPV	NMBP	7000 kg/ha	Mid-altitude areas	2008
	Chitedze 2	OPV (QPM)	NMBP	5000 kg/ha	Mid-altitude areas	2009
	Chitedze 4	OPV	NMBP	7000 kg/ha	Mid-altitude areas	2009
	ZM 309	OPV	NMBP	5000 kg/ha	Low-altitude areas	2009
	ZM 523	OPV	NMBP	6000 kg/ha	Low and some mid-altitude areas	2009
	SC 719	Semi-flint hybrid	Seed Co Malawi	10000 kg/ha	High rainfall areas	2008
	DKC 80- 73	Flint hybrid	Monsanto	10000 kg/ha	700-1,350 masl/ 550-950 mm rainfall	2005
	DKC 80-53	Flint hybrid	Monsanto	10000 kg/ha	Mid-altitude areas	2008
	DKC 90-89	Flint hybrid	Monsanto		Mid and low- altitude areas	2010
	Thanzi	QPM hybrid	NMBP/CIMMYT	5,000kg/ha	Low to medium	2002
	CZR 3	Flint hybrid	NMBP	7,000kg/ha	Wide adaptation	2002
	CRZ 4	Flint hybrid	NMBP	9,000kg/ha	Wide adaptation	2002
	CZR 8	Flint hybrid	NMBP	10,000kg/ha	Wide adaptation	2002
	DK 8031	Dent hybrid	Monsanto/NSCM	8,000kg/ha	Low altitude areas (<500masl)	2001
	DK 8041	Hard-dent hybrid	Monsanto/NSCM	9,000kg/ha	Medium altitude (500-1,500masl)	2000
	DK 8051	Semi-dent hybrid	Monsanto/NSCM	9,000kg/ha	Medium altitude	2001
	DK 8071	Semi-flint hybrid	Monsanto/NSCM	10,000kg/ha	Medium altitude	2000
	DKC 8033	Hard-dent hybrid	Monsanto	12,000kg/ha	Medium altitude	2003
	PAN 33	Flint hybrid	Pannar	7,000kg/ha	Wide adaptation	2003
	PAN 77	Flint hybrid	Pannar	6,500kg/ha	Wide adaptation	2003
	PAN 57	Flint hybrid	Pannar	6,000kg/ha	Wide adaptation	2005
	PAN 63	Flint hybrid	Pannar	6,000kg/ha	Wide adaptation	2005
	SC 407	Semi-dent	SeedCo	5,000kg/ha	Marginal rainfall areas: Lakeshore/Shire valley	2000
	SC 501	Semi-dent	SeedCo	6,000kg/ha	Wide adaptation	2000
	SC 513	Dent hybrid	SeedCo	9,000kg/ha	Dimba areas	2002
	SC 515	Dent hybrid	SeedCo	6,000kg/ha	Wide adaptation	2000
	SC 633	Dent hybrid	SeedCo	12,000kg/ha	Wide adaptation	2003
	SC 627	Semi-dent	SeedCo	10,000kg/ha	Wide adaptation	2000
	SC 709	Dent hybrid	SeedCo	13,000kg/ha	Medium altitude areas	2000
	SC 713	Dent hybrid	SeedCo	13,000kg/ha	Medium altitude areas	2000
	SC 715	Dent hybrid	SeedCo	11,000kg/ha	Medium and high altitude areas	2002
	SC 717	Semi-dent hybrid	SeedCo	13,000kg/ha	Medium-high altitude areas	2002
	PHB 30G97	Flint hybrid	Pioneer	10,000kg/ha	Medium altitude areas	2001
	PHB 30H83	Flint hybrid	Pioneer	10,000kg/ha	Medium altitude areas	2001
	MRI 724	Semi-dent hybrid	MRI of Zambia	13,000kg/ha	Wide adaptation	2001

	MRI 734	Semi-dent hybrid	MRI of Zambia	10,000kg/ha	Medium altitude areas	2001
	ZM 421	OPV	NMBP	5,000kg/ha	Low altitude areas/low soil nitrogen/drought	2001
	ZM 521	OPV	NMBP	7,000kg/ha	Low and medium altitude areas	2001
	ZM 611	OPV	NMBP	8,000kg/ha	Wide adaptation	2003
	ZM 623	OPV	NMBP	9,000kg/ha	Wide adaptation	2003
	ZM 621	OPV	NMBP	6,000kg/ha	Low and medium altitude areas	2000
	AFRIC 1	OPV	Afgri Seed/SA	8,000kg/ha	Wide adaptation	2004
Rice	Vyawo	130/150 days	NRBP	6,000kg/ha	Irrigation schemes	2000
	Mtupatupa	130 /155 days	NRBP	6,000kg/ha	Irrigation shemes	2000
	Nunkile	112/140 days	NRBP	6,000kg/ha	Irrigation schemes and most medium altitude	2000
	Lifuwu	90/120 days	NRBP	5,500kg/ha	High level adaptability	2003
	Wambone	>120 days	NRBP	5,700kg/ha	High level adaptability	2003
	Kameme	90/120 days	NRBP	3,700kg/ha	High altitude areas	2003
Wheat	SC Nduna	100 days maturity	Seed Co Malawi	8000 kg/ha	High altitude areas	2009
	SC Smart	100 days maturity	Seed Co Malawi	7000 kg/ha	High altitude areas	2009
	SC Stallion	100 days maturity	Seed Co Malawi		High altitude areas	2009
Sorghum	Gwiramtima	105 days maturity	NSPBP	3,500kg/ha	Shire valley	2003
	Makolokoto	140 days maturity	NSPBP	3,700kg/ha	Shire valley	2003
	Sinakhomo	112 days maturity	NSPBP	3,000kg/ha	Shire valley	2003
	Kayera	121 days maturity	NSPBP	3,000kg/ha	Machinga, Salima and Karonga	2003
	Acc 967	121 days maturity	NSPBP	3,500kg/ha	Machinga, Salima and Karonga	2003
Pearl Millet	Thobwa	Tall (179 cm tall)	NSMBP	2800 kg/ha	Low-altitude area (Shire valley/Lakeshore)	2004
Groundnut	Chitala	Spanish type	NGBP	2000 kg/ha	Medium and low altitude areas	2005
	Chalimbana 2005	Virginia type	NGBP	2,500 kg/ha	Medium and low altitude areas	2005
	Kakoma	Erect bunch	NGBP		Low altitude areas	2000
	Baka	Erect bunch	NGBP		Low altitude areas	2001
Bambara	Kayera	85g/100 seed	MPGRC	880 kg/ha	Marginal rainfall/poor soil fertility areas	2009
	Makata	92g/100 seed	MPGRC	1160 kg/ha	Marginal rainfall/poor soil fertility areas	2009
	Kadziunde	42g/100 seed	MPGRC	900 kg/ha	Marginal rainfall/poor soil fertility areas	2009
Beans	BCMV-B2	Indeterminate	Bunda	2500 kg/ha	Wide adaptation	2005
	BC-D/O (19)	Determinate	Bunda	2000 kg/ha	Wide adaptation	2005
	BCMV-B4	Indeterminate	Bunda	1500 kg/ha	Wide adaptation	2005
	VTTT924/4-4	Cream seed type	NBBP	2500 kg/ha	Wide adaptation	2009
	NUA 45	Determinate	NBBP	1300 kg/ha	Wide adaptation	2009
	NUA 59		NBBP	2000 kg/ha	Wide adaptation	2009

	Sugar 131	Indeterminate	NBBP	1,500kg/ha	Low soil fertility areas	2002
	UBR (92) 25	Indeterminate	NBBP	1,500kg/ha	Low soil fertility areas	2002
Soybean	TGX 1740-2F	Self nodulating		7000 kg/ha		2010
	Solataire	Determinate	SeedCo	3,500kg/ha	Wide adaptation	2003
	Soprano	Determinate	SeedCo	3,500kg/ha	Wide adaptation	2003
	747/6/8	123 days maturity	NSBP	1,958kg/ha	Wide adaptation	2003
Pigeon pea	ICEAP 00557	Medium maturity	NPPBP	3500 kg/ha	Semi-arid environments	2009
	ICEAP 01514/15	Semi-spreading	NPPBP	2500 kg/ha	Semi-arid environments	2010
	Kachangu	Early Maturity	NPPBP/IPMP	5,000kg/ha	Semi-arid environments	2000
	ICPL 87105	Early Maturity	NPPBP	2,500kg/ha	Semi-arid environments	2003
	ICPL 87015	Early Maturity	NPPBP	2,500kg/ha	Semi-arid environments	2003
	ICPL 93026	Early Maturity	NPPBP	2,500kg/ha	Wide adaptation	2003
Cowpea	IT99K-494-6	Medium maturity	Bunda/NBP	2500 kg/ha	Medium and low altitude areas	2010
	Sudan 1	Early maturity	NCIP	1,331kg/ha	Medium and low altitude areas	2003
	IT82E-16	Medium maturity	NCIP	1,341kg/ha	Medium and low altitude areas	2003
Sunflower	HV 3037	Early maturity	NSIP	3000 kg/ha	Wide adaptation	2005
Tomatoes	Phindu	Indeterminate	NHIP	50 tons/ha	Field conditions	2002
	Mbambande	Moderate firm fruit	NHIP	60 tons/ha	Greenhouse conditions	2002
	Khama	Firm fruit	NHIP	78 tons	Greenhouse conditions	2002
	STAR 9003	Firm fruit	NHIP	71 tons	Greenhouse conditions	2002
	Changu	Determinate growth	NHIP	70 tons	Field conditions	2002
Bananas	CARDABA	Cooking banana	NHIP	16 kg/bunch	Karonga, Chitipa, Nkhatabay	2008
	PELIPITA	Cooking banana	NHIP	13 kg/bunch	Karonga, Chitipa, Nkhatabay	2008
	SABA	Cooking banana	NHIP	14 kg/bunch	Karonga, Chitipa, Nkhatabay	2008
	TMB x 1378	Dessert banana	NHIP	17000 kg/ha	Black sigatoka problem areas/Thyolo/Mulanje	2008
	SH 3640	Dessert banana	NHIP	17000 kg/ha	Black sigatoka problem areas/Thyolo/Mulanje	2008
	FHIA-17	Dessert banana	NHIP	41 kg/bunch	Karonga, Chitipa, Nkhatabay/Thyolo/Mulanje	2010
	FHIA-25	Cooking banana	NHIP	50 kg/bunch	Karonga, Chitipa, Nkhatabay/Thyolo/Mulanje	2010
Cassava	Phoso	Bitter type	NRTIP	35 tons/ha	Lakeshore /Machinga/Zomba/ Shire highlands	2008
	Mulola	Bitter type	NRTIP	40 tons/ha	Lakeshore /Machinga/Zomba/ Shire highlands	2008
	Sagonja	Bitter type	NRTIP	40 tons/ha	Lakeshore /Machinga/Zomba/ Shire highlands	2008
	Chiombolo	Bitter type	NRTIP	45 tons/ha	Lakeshore /Machinga/Zomba/ Shire highlands	2009
	Mpale	Sweet type	NRTIP		Lakeshore /Machinga/Zomba/ Shire highlands	2010

	Kalawe	Sweet type	NRTIP		Lakeshore /Machinga/Zomba/ Shire highlands	2010
	Chimandanda	Sweet type	NRTIP		Lakeshore /Machinga/Zomba/ Shire highlands	2010
	Mkondezi	Bitter type	NRTIP	25 tons/ha	Lakeshore /Machinga/Zomba/ Shire highlands	2000
	Maunjili	Bitter type	NRTIP	22 tons/ha	Lakeshore /Machinga/Zomba/ Shire highlands	2000
	Sauti	Bitter type	NRTIP	35 tons/ha	Lakeshore, Machinga, Zomba, Shire highlands	
	Silira	Bitter type	NRTIP	16 tons/ha	Lakeshore /Machinga/Zomba/ Shire highlands	2000
	Yizaso	Bitter type	NRTIP	25 tons/ha	Lakeshore /Machinga/Zomba/ Shire highlands	2002
S. potato	Zondeni	Erect type	NRTIP	16 tons/ha	Lakeshore /Machinga/Zomba/ Shire highlands	2008
	Sakananthaka		NRTIP	20 tons/ha	Lakeshore /Machinga/Zomba/ Shire highlands	2008
	Semusa	Spreading type	NRTIP/CIP	30 tons/ha	Lakeshore /Machinga/Zomba/ Shire highlands	2000
	Mugamba	Semi-erect type	NRTIP/CIP	26 tons/ha	Lakeshore /Machinga/Zomba/ Shire highlands	2000
	Tainoni	Spreading type	NRTIP/AVRDC	21 tons/ha	Lakeshore /Machinga/Zomba/ Shire highlands	2000
	Salera		NRTIP	16 tons/ha	Lakeshore /Machinga/Zomba/ Shire highlands	2002
Yams	Mulanje		NRTIP	35 tons/ha	Thyolo/Zomba/ Shire highlands	2005
	Swenga		NRTIP	21 tons/ha	Thyolo/Mulanje/Zomba/ Shire highlands	2005
	Mulosa		NRTIP	13 tons/ha	Thyolo/Mulanje/Zomba/ Shire highlands	2005
	Chizunga		NRTIP	29 tons/ha	Thyolo/Mulanje/Zomba/ Shire highlands	2005
Paprika	CPS 15		NHIP/Hungary		Well drained Sunday loan fertile soils	2009
	Mkonzakomo		NHIP	2,900kg/ha	Wide adaptation	2003
Tea	PC 175	Progeny clone	TRFCA	N/A	Thyolo, Mulanje and Nkhatabay	2001
	PC 198	Progeny clone	TRFCA	N/A	Thyolo, Mulanje and Nkhatabay	2001
	PC 213	Progeny clone	TRFCA	N/A	Thyolo, Mulanje and Nkhatabay	2001
	RC 7	Rootstock clone	TRFCA	N/A	Thyolo, Mulanje and Nkhatabay	2002
	RC 13	Rootstock clone	TRFCA	N/A	Thyolo, Mulanje and Nkhatabay	2002
	RC 15	Rootstock clone	TRFCA	N/A	Thyolo, Mulanje and Nkhatabay	2002
	RC 16	Rootstock clone	TRFCA	N/A	Thyolo, Mulanje and Nkhatabay	2002
Macadamia	Clone 788	Clone	NFTIP	20/tree	Thyolo	2001
Cotton	Makoka 2000	Compact growth	NCBP	3,000kg/ha	Shire valley/Lakeshore/Machinga/Balaka	2000
	FQ 902	Compact growth	NCBP/Zimbabwe	>3,000kg/ha	Shire valley/Lakeshore/Machinga/Balaka	2002
	SZ 9314	Compact	NCBP/Zimbabwe	3,500kg/ha	Shire	2002

		growth			valley/Lakeshore/Machinga/Balaka	
	Chureza	Compact growth	NCBP/Zambia	3,800kg/ha	Medium and high altitude areas	2003
Tobacco	RJR 35	Flue-cured	ARET	3500 kg/ha	Kasungu/Lilongwe/Zomba/Shire highlands	2007
	AFH I	Flue-cured	ARET	3000 kg/ha	Kasungu/Lilongwe/Zomba/Shire highlands	2007
	AFH 2	Flue-cured	ARET	3000 kg/ha	Kasungu/Lilongwe/Zomba/Shire highlands	2007
	AFH 3	Flue-cured	ARET	3000 kg/ha	Kasungu/Lilongwe/Zomba/Shire highlands	2007
	AFH 4	Flue-cured	ARET	3000 kg/ha	Kasungu/Lilongwe/Zomba/Shire highlands	2007
	AWL 10	Flue-cured	ARET	3000 kg/ha	Kasungu/Lilongwe/Zomba/Shire highlands	2007
	AWL 28	Flue-cured	ARET	3000 kg/ha	Kasungu/Lilongwe/Zomba/Shire highlands	2007
	BRK 1	Burley	ARET/Zimbabwe	3500 kg/ha	Kasungu/Lilongwe/Zomba/Shire highlands	2007
	BRK 5	Burley	ARET/Zimbabwe	3500 kg/ha	Kasungu/Lilongwe/Zomba/Shire highlands	2007
	NC 4	Burley	ARET	3500 kg/ha	Kasungu/Lilongwe/Zomba/Shire highlands	2007
	Elsoma	Oriental	ARET		Thyolo/Mulanje/Zomba	2007

IV. FIELD FINDINGS: ACROSS SITES

The fieldwork for the SSSA took place in October 2011 as farmers were assessing their seed stocks and planning for the imminent planting season.

The assessment considered two major themes. It analyzed the short-term, acute seed security situation, focusing on the 2010- 2011 main season (extending November-April) and the 2011-2012 main season (again extending November to April). Seed procurement strategies, quantities sown, 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 crop diversification, agricultural product transformation, access to modern varieties, use of other inputs and seed aid received.

This section presents field findings on seed security across the three assessment sites.[4] Comprehensive site by site reports (for Zomba, Balaka and Chikwawa) are available from WALA Malawi (jmkumbira@walamalawi.org). The tailored action plans, site by site have been appended in Annex I.

This chapter is organized first to present findings centering on acute seed security (2010- 2011 and 2011-2012 agricultural seasons) and then analyses trends over multiple seasons to consider chronic problems as well as emerging opportunities.

Acute Seed Security Findings, 2010-2011 and 2011-2012

Issues of seed security were first scrutinized for the short term: how and where did farmers obtain seed for the main 2010- 2011 season? Did they plant a 'normal' quantity of planting material? What do they assess as their seed security strategy and prospects for the 2010- 2011 season. Note that seed system stability and resilience are best assessed by looking at multiple seasons in a row.

Seed sources and quantities planted, 2010-2011 main season

Table 4.1 and Figure 4.1 show the sources and quantities of seed actually planted by farmers for the main 2010- 2011 season. Information is given in both table and graph form so as to make highly visible the relative use of sources and the scale of seed use from each. Several features are of note.

Overall, about 70% of the seed farmers sowed came from local channels, including from farmers' own stocks, the local market, 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 and local markets were almost equally important as the major sources (27.5 and 31.3% respectively) and suggests the degree to which poor farmers may have to buy, routinely, seed season after season. Home stocks were of some importance for all crops but

[4] The seed security focus is on the three crops farmers each consider 'most important' so there may be some under-reporting of secondary crops, which are also key for nutrition and income.

cassava.[5] The local market as a source was important for all crops but cotton, and the vegetatively-propagated crops of sweet potato and cassava.

Neighbours, friends and relatives were especially important as a seed source for sweet potato and cassava. The strong use of such 'social network' channels to obtain cuttings and stems has implications for designing initiatives to multiply these planting material as well as for efforts to introduce new varieties such as those resistant to cassava mosaic virus or high in vitamin A (like sweet potato).

Farmer seed producers, those community-based groups most often mobilized by the government, FAO or certain development projects, provided 0.1% of the seed sown within the sample. While they may have a presence nationwide or even in select zones of the assessment area, they are obviously at a fledging stage, with modest (i.e. no measurable) impact on farm.

Agro-input dealers provided a modest proportion of the seed overall, (17%), but was particularly important for two crops: maize (16.6% of total seed sown) and cotton (76.4%). Note that agro-dealer access was consider 'easy' in two of the three sites (Kalembo and Maseya), but 'faraway' by the community in Mlumbe. Use of these shops could potentially rise a) if the placement of agro-dealers were made more accessible to rural clients and b) if such agro-dealers put a larger range of products on offer. Increased interest for legume seed – pigeon pea, groundnuts, common beans, soyabeans and cowpeas-- did emerge as a finding of the SSSA.

Finally, seed aid[6], which here includes both developmental and emergency aid, provided about 12% of the total seed sown in the 2010-2011 season, with such aid including both the FISP program (8.6%) and NGO/FAO assistance (4.1%). Seed aid had some importance for maize (16% of the seed sown), groundnut (18.4% seed sown, pigeon pea (about 6% of seed sown) and cotton (about 14% seed sown). It is interesting to note that for all these 'aid crops' farmers sourced about 85% of their seed on their own.

[5] Sample sizes for other crops where home stocks are zero are too small to draw any conclusions.

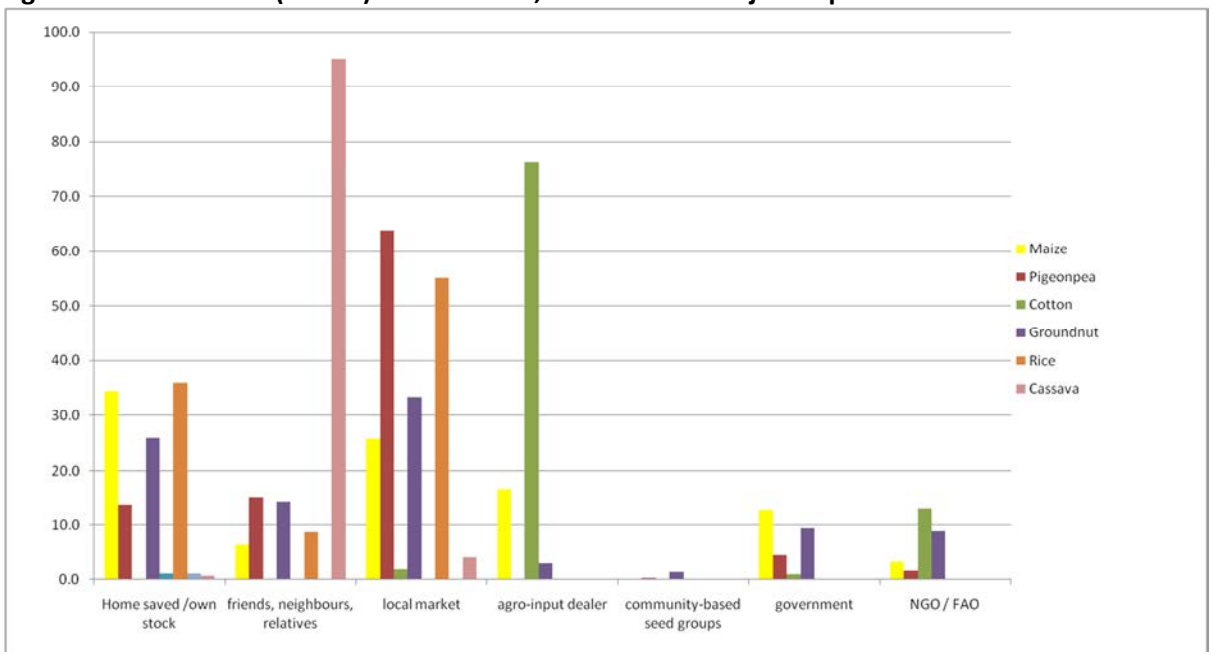
[6] The disaggregation of seed aid between NGOs and FAO in many tables and figures does not give a completely accurate representation of source as government or FAO-linked seeds may also have been distributed by NGOS.

Table 4.1: Seed (%) planted and sources farmers used, 2010-2011 across three sites

Crop	Total kg sowed	% of total									
		Home saved /own stock	friends, neigh., relatives	local market	agro-dealer	CBSM	Govt	NGO FAO	contract seed growers	Other	TOTAL %
Maize	2573.3	34.5	6.4	25.8	16.6	0.0	12.7	3.3	0.0	0.0	**99.4**
Sorghum	15.5	58.1	3.2	38.7	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Millets	27.1	33.2	20.7	42.4	0.0	0.0	0.0	0.0	0.0	3.7	**100.0**
Rice	136.0	36.0	8.8	55.1	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Cassava	61.8	0.6	92.1	4.0	0.0	0.0	0.0	0.0	0.0	0.0	**96.8**
Sweet potato	60.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Groundnut	394.9	26.0	14.2	33.4	3.0	1.3	9.5	8.9	0.0	3.8	**100.0**
Common beans	341.2	39.0	1.8	54.4	3.5	0.0	1.5	0.0	0.0	0.0	**100.1**
Cowpea	7.7	0.0	13.0	87.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Pigeon pea	531.6	13.6	15.0	63.9	0.0	0.2	4.5	1.7	0.0	1.1	**100.0**
Mustard	21.0	23.8	0.0	60.6	15.6	0.0	0.0	0.0	0.0	0.0	**100.0**
Cotton	445.0	0.0	0.0	2.0	76.4	0.0	0.9	13.0	5.4	2.2	**100.0**
Chickpeas	2.5	20.0	0.0	80.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Pumpkin	0.9	29.4	70.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Sesame	1.5	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Velvet beans	3.5	71.4	28.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
TOTAL, all crops	4623.4	27.5	9.6	31.3	17.	0.1	8.6	4.1	0.5	0.7	99.6

- **community-based seed multiplication**

Figure 4.1. Farmers' (N=180) seed sources, 2010-2011 6 major crops



Seed sourcing patterns did vary somewhat by site, and it is important to tailor for such local variation when designing seed system support strategies. In Zomba, farmers' own stocks and use of local market were important across three major crops. While such sources were important in Chikwawa for the major food crops, agro-dealer were a paramount source for the major cash crop of cotton (see Figures 4.2 and 4.3).

Figures 4.2/4.3. Farmers' seed sources in two sites, 2010-2011, 3 *major crops*

Figure 4.2. Zomba

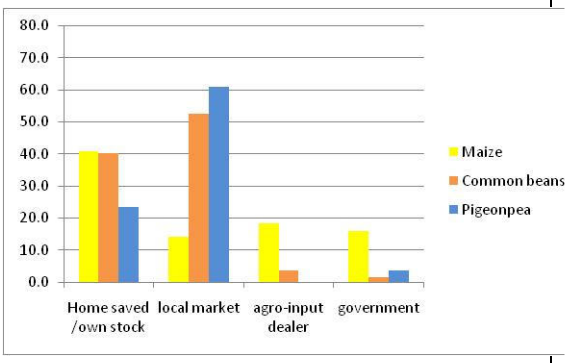
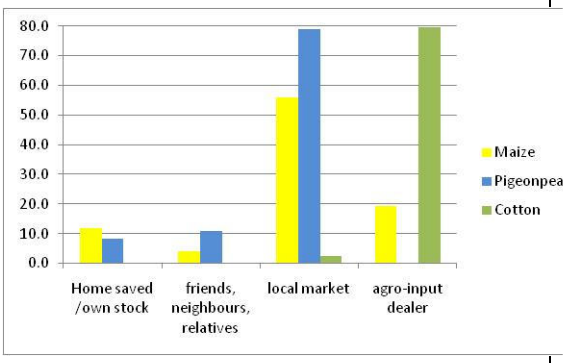


Figure 4.3. Chikhwawa



Are farmers seed-stressed 2010-2011?

(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 2010-2011 quantities of seed they sowed, by crop, with what they would normally sow at the same time each year. Basically, the question was this: Were the 2010- 2011 patterns 'normal' or 'different' from what farmers usually do, as gauged by the farmers themselves?

Farmers reported that they, overall, had increased the quantities sown, across crops by some 14%. Also, crop by crop, farmers planted 'the same amount' or even 'more' in over 8% of cases. So the 2010-2011 was fairly normal (and, at times) good one for farmers (at least as indicated by amounts of seed sown).

Table 4.2: Farmers' sowing amounts for 2010-2011 - more, less, or same?

Crop	Number of farmers	% of households			Change in seed quantites for all growing the crop	
		MORE	SAME	LESS	mean %	
Maize	179	15.1	68.7	16.2	5.24	
Sorghum	7	0.0	85.7	14.3	-8.57	
Millets	12	25.0	41.7	33.3	9.31	
Rice	11	27.3	45.5	27.3	10.98	
Cassava	12	41.7	41.7	16.7	14.63	
Sweet potato	2	0.0	100.0	0.0	0.00	
Groundnut	59	15.3	67.8	16.9	8.81	
Common beans	50	6.0	66.0	26.0	-12.98	
Cowpea	6	16.7	66.7	0.0	16.67	
Pigeonpea	110	15.5	66.4	18.2	12.95	
Mustard	10	40.0	40.0	20.0	372.50	
Cotton	47	25.5	55.3	19.1	18.26	
Chickpeas	2	0.0	100.0	0.0	0.00	
Pumpkin	3	33.3	66.7	0.0	33.33	
Sesame	2	0.0	100.0	0.0	-25.00	
Velvet beans	2	0.0	50.0	50.0	-25.00	
TOTAL	**514**	**16.5**	**64.8**	**18.5**	**14.17**	

Note that sowing amounts portray only part of the picture. The crop yield and general harvests were reported by farmer also as quite good (that is, as 'average' in over 85% of cases and across crops. So, even in terms of yields, 2010-2011 was a promising season.

Table 4.3: Farmers' assessment of yield by crop, 2010-2011

Source		How was yield?					
		N			%		
	total N	good	average	poor	good	average	poor
Home saved /own stock	126	66	44	16	**52.4%**	**34.9%**	**12.7%**
friends, neighbours, relatives	75	42	20	13	**56.0%**	**26.7%**	**17.3%**
local market	241	136	58	47	**56.4%**	**24.1%**	**19.5%**
agro-input dealer	117	89	21	7	**76.1%**	**17.9%**	**6.0%**
community-based groups	2	1	0	1	**50.0%**	**0.0%**	**50.0%**
Government	78	52	19	7	**66.7%**	**24.4%**	**9.0%**
NGO / FAO	24	20	3	1	**83.3%**	**12.5%**	**4.2%**
contract seed growers	1	0	1	0	**0.0%**	**100.0%**	**0.0%**
Other	5	4	1	0	**80.0%**	**20.0%**	**0.0%**
TOTAL	669	**410**	**167**	**92**	**61.3%**	**25.0%**	**13.8%**

Seed sources and quantities to be planted 2011-2012 main season

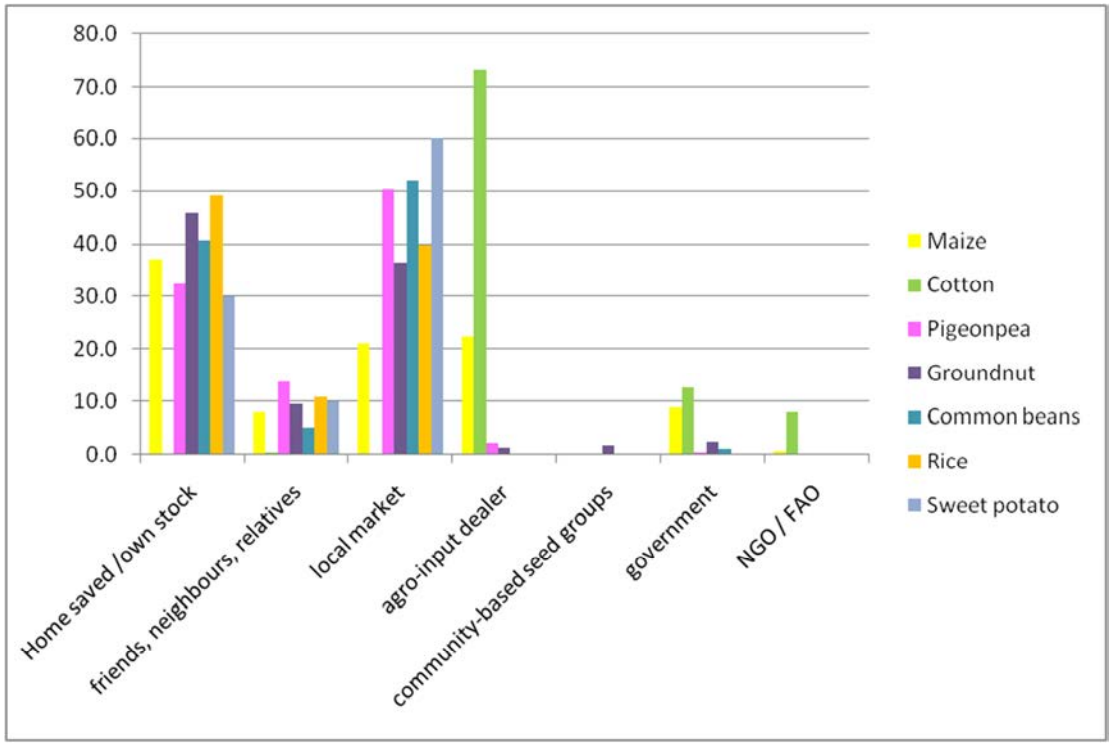
Farmers in Southern Malawi were asked the same questions on actual seed sources and quantities to be planted for the next major season, 2011-2012 which was but a few weeks away at the time of the SSSA. While 'planned seed sources' are not proven 'hard' data , they are a good indicator of whether farmers expect seed stress or other related troubles. Furthermore, given that many of the interviews were conducted by former aid providers, farmers answering this question could have also shown bias by trying to elicit seed aid help. In contrast, the results below show a strong trend toward self-sufficiency – and away from asking for seed-related aid. **In general, anticipated use of seed sources for 2011-2012 was the same as for the previous main season, with use of own stocks and agro-dealers being slightly up and that of local markets slightly down. Seed expected from aid sources (government, NGO/FAO) was anticipated at only 7.6% versus the actual 12.7% of all seed sown the main season previous** (see Table 4.4. and Figure 4.4).

Table 4.4: Seed (%) planted and sources farmers used, 2011-2012 across three sites

Crop	Total kg sowed	Home saved /own stock	friends, neigh. relatives	local market	agro dealer	CBSM*	Govt	NGO / FAO	contract seed growers	Other	Total
Maize	2736.1	37.0	7.9	21.2	22.5	0.0	8.8	0.5	0.0	0.0	**99.1**
Sorghum	20.0	95.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Millets	43.0	41.9	9.3	39.5	0.0	0.0	9.3	0.0	0.0	2.3	**102.3**
Rice	201.0	49.3	10.9	39.8	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Cassava	17.2	90.1	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Sweet potato	150.0	30.0	10.0	60.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Groundnut	556.3	45.8	9.5	36.5	1.3	1.8	2.4	0.0	0.0	2.7	**100.0**
Common beans	444.0	40.7	5.0	52.1	0.0	0.0	1.1	0.0	0.0	0.0	**98.9**
Cowpea	2.2	22.7	0.0	77.3	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Pigeon pea	575.7	32.4	13.7	50.3	2.1	0.0	0.3	0.0	0.0	1.0	**99.8**
Mustard	44.7	11.2	0.1	18.9	69.8	0.0	0.0	0.0	0.0	0.0	**100.0**
Cotton	635.5	0.0	0.3	0.0	73.2	0.0	12.7	7.9	1.6	4.4	**100.0**
Tobacco	0.6	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Pumpkin	0.6	83.3	16.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Soya bean	5.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Sesame	1.5	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
Velvet beans	7.5	33.3	66.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**
TOTAL all crops	5440.9	33.8	7.8	27.6	20.8	0.2	6.4	1.2	0.2	0.9	**99.5**

*community-based seed multiplication

Figure 4.4. Planned sources for cropping seasons 2011-2012 all farmers (N=180)



Are farmers seed-stressed in 2011-2012 main season?

To complete the analysis, we compared farmers' projections for 2011 planting with what they assess as normal amounts of seed; that is, we looked at whether they are planning to plant more, less or the same?

Remarkably, 88.5% of farmers plan to maintain or increase the amounts they sow in 2011-2012 with planned increases overall of 27.5%. Farmers particularly aim to intensify production of groundnuts, pigeon pea and cotton (i.e., those crops with good sample sizes and sharp mean % increases) (Table 4.5). They are clearly gearing their strategy towards income generating crops (see also Table 4.9-reasons for planting more).

Table 4.5: Farmers' sowing amounts for 2011-2012 - more, less, or same?

-		% of households			Change in seed quantities for all growing the particular crop
Crop	**# farmers**	**MORE**	**SAME**	**LESS**	**mean %**
Maize	178	23.0	58.4	18.5	10.25
Sorghum	7	28.6	71.4	0.0	21.43
Millets	12	33.3	58.3	8.3	28.33
Rice	11	45.5	54.5	0.0	64.50
Cassava	10	60.0	30.0	10.0	26.11
Sweet potato	3	0.0	100.0	0.0	0.00
Groundnut	65	36.9	52.3	10.8	63.43
Common beans	51	29.4	56.9	13.7	27.92
Cowpea	4	50.0	50.0	0.0	50.00
Pigeon pea	109	30.3	63.3	6.4	31.06
Mustard	11	45.5	45.5	9.1	16.67
Cotton	54	51.9	40.7	7.4	33.44
Pumpkin	2	50.0	50.0	0.0	50.00
Sesame	2	0.0	100.0	0.0	0.00
Velvet beans	2	50.0	50.0	0.0	75.00
TOTAL	**523**	**32.5**	**56.0**	**11.9**	**27.50**

Box 4.1: Farmers' planting the 'same' or 'more' is not necessarily a sign of farming and seed system health.

Farmers in Southern Malawi, for two season in a row, are planting the 'same' or 'more' (greater amounts) of seed. This certainly indicates that the period has been one of agricultural stability. Farmers even remark on relatively good yields—for Southern Malawi, at least.

But it is always important to remember the context. The 2011 Human Development Report ranks Malawi as number 171 out of 187 countries and in the category of 'low human development' (UNDP, 2011).

Also, Malawi-focused vulnerability studies show the southern region to have the highest incidence of poverty, an astonishing 59.7% of households (Devereux, et al., 2006).

So yes, that farmers are planting 'normally' is a good sign—-but not good enough.

Obviously, the agricultural systems need to be jumpstarted: higher yields, more nutritional yields, yields that bring in more income. (see... Recommendations).

Focusing on potential problems areas and spurring production

Potential problem areas

The relatively 'normal' and even promising picture for 2011 and 2012 should not obscure that there may be vulnerable populations -- or other key reasons -- why some farmers are planting less---and which are important for helping to design critical support assistance. Tables 4,2 and 4.5 showed that farmers were 'planting less' in 18.5 and 11.9% of cases, . for the 2011 and 2012 seasons respectively .

To understand more clearly the nature of this decline, farmers were asked to explain why they were planting less of a given crop for each of the seasons. Many and diverse reasons were given. These sometimes reflect Important stresses: " I had no money to buy more seed' or the goats keep on eating the cassava' (the latter being a common constraint in Kalembo, Balaka). However, there were also important positive reasons for 'planting less' "I am able to sow less now, because I sow in rows--- so fewer kilos are needed for much better harvest", or 'use of conservation agriculture allows me to use less seed."

Across both seasons, there is a small cluster of reasons why farmers' sow less. Most important, farmers who sow less lacked sufficient funds to buy seed (49.5% and 46.8% of cases). Only 5% of the sample who planted less indicated that their constraints were linked with seed not being available —and much of this had to do with scarcity of planting material for cassava. Uncertainty of rainfall also held back a number of farmers from sowing normal amounts.

On a positive side, a good number of farmers are sowing less as better agricultural practices allow them to economize on seed. Get the same or better yields—for less seed (Table 4.6).

Table 4.6: Reasons (% of responses) farmers cited for planting less of certain crops in 2010- 2011 and 2011-2012 main seasons.

Reason	2010-2011 (n=95)	2011-2012 (n=62)
SEED- RELATED (or indirectly linked)		
Seed availability		
no seed available in market	5.3%	0%
no seed/cuttings available from neighbors	3.2%	0%
Seed access		
no money to buy seed/poor finances or seed too high	**49.5%**	**46.8%**
Seed quality		
seed available is not good quality or variety is not liked	1.1%	0%
sub-total: Seed-related	58.9%	46.8%
NON-SEED FACTORS OF PRODUCTION (Limits)		
no/insufficient labor	2.1%	6.5%
illness/health problems	4.2%	3.2%
no/insufficient land or land not appropriate/sufficiently fertile	7.4%	4.8%
lack of tools/tractor/ other machinery to farm	0.0%	0%
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	0.0%	0%
poor weather/rainfall	6.3%	11.3%
Insecurity	0.0%	0%
sub-total: production-related factors	20.0%	25.8%
OTHER PRIORITIES/STRATEGIES		
markets for crop or crop products not well-developed	4.2%	1.6%
other priorities than agriculture (e.g. have shop)	0.0%	0%
Other	4.2%	2.8%
Changing Crop priorities or changing agricultural practices	**10.5%**	**8.5**
TOTAL	**97.9%**	**85.5%**

The real seed security issue: Money

In reviewing seed security constraints across two seasons (2010-2011, 2011-2012), what comes out clearly is that the major reason for farmers planting less of a crop has to do with money, that is, not having the resources to buy addition seed. Lack of seed (seed not being available) and seed quality (not finding the right variety or right quality seed) do not figure as important limiting factors. The degree of money stress becomes more visible when one focuses on the most stressed region like the drought-stricken district of Chikhwawa. For 2010-11, farmers there required on average 2049 MWK (c.$ US 12.80) to buy seed. For the

2011-2012 season, money needed for seed purchases rises 36% (to MWK 2795 or about $US 17.50) (Tables 4.7 and 4.8).

Tables 4.7/4.8 : Chikhwara farmers' cash needs for seed purchase (MWK) 2010- 2011 vs 2011-2012.

Table 4.7 2010-2011

	CHIKHWAWA	Average purchases (MWK/HH) 1) FOR THOSE SOWING CROP			
Crop	Farmers growing crop	Local market	Ag input dealers	All	% of total
Maize	61	140.8	386.9	**527.7**	**25.8%**
Pigeon pea	27	384.0	0.0	**384.0**	**18.7%**
Cotton	39	11.5	0.0	**11.5**	**0.6%**
Millets	11	20.9	0.0	**20.9**	**1.0%**
Rice	11	1104.5	0.0	**1104.5**	**53.9%**
TOTAL		1661.8	386.9	**2048.6**	**100.0%**

Table 4.8 2011-2012

	CHIKWHAWA	Average purchases (MWK/HH) 1) FOR THOSE SOWING CROP			
Crop	Farmers growing crop	Local market	Ag input dealers	All	% of total
Maize	60	166.5	620.0	**786.5**	**28.1%**
Pigeon pea	26	484.6	0.0	**484.6**	**17.3%**
Cotton	44	0.0	0.0	**0.0**	**0.0%**
Millets	11	69.5	0.0	**69.5**	**2.5%**
Rice	11	1454.5	0.0	**1454.5**	**52.0%**
TOTAL		2175.2	620.0	**2795.2**	**100.0%**

Spurring production

To complete this analysis of the rationale for farmers' planting decisions, we end on a positive note: why those who planted more did so (Table 4.9) . Households plant more for multiple and diverse reasons especially getting access to more land, and seizing on new marketing opportunities also directly expanded seed use (and hence expanded land area). Finally, having more seed, either through harvest or receiving it free, did make a difference, especially for crops such as cassava, where access to cuttings can be a problem.

Table 4.9: Reasons (% of responses) farmers cited for planting more of a given crop in 2010- 2011.

Reason	#	% of responses
SEED RELATED		
Seed availability		
more seed available due to good harvest	10	**11.8**%
more seed available due to free seed	6	7.1%
Seed access		
more money to buy seed or seed price low	4	4.7%
got credit to buy seed	0	0.0%
Seed quality		
have especially good seed or good variety	3	3.5%
sub-total: Seed-related	**23**	**27.1%**
NON-SEED FACTORS OF PRODUCTION (opportunities)		
good/increased labor	1	1.2%
feeling strong/healthy	1	1.2%
have more land/more fertile land	18	**21.2**%
have tools/tractor, other machinery to help farm	0	0.0%
have access to irrigation, fertilizer or other inputs (for example, stakes)	0	0.0%
good weather/rainfall	0	0.0%
good security (peace has arrived)	0	0.0%
sub-total: factors of production-related	**20**	**23.5%**
OTHER PRIORITIES/STRATEGIES		
well-developed /new markets for crop or crop products	26	**30.6**%
have decided to give more priority to agriculture	4	4.7%
Other	10	11.8%
TOTAL	**85**	**97.6%**

Can the markets deliver seed 2011-2012?

In all of this, a key question in seed security becomes, "Can the markets deliver? Will seed be put on offer, with the quality that farmers want and at prices that make purchase accessible for smallholder farmers?

Chapter III looked at general seed/grain market functioning. Here we summarize the salient issues to determine if there are supply problems--- or not.

Agro-dealer and formal seed supply 2011-2012

The SSSA team interviewed agro-dealers and formal seed sector companies in every site of the assessment. This included visits across a range agencies, specialized stores, and input delivery chains, including even supermarkets: *inter alia*, ADMARC, SFFRFM, AGORA, Kulima Gold, Chipiku, Metro, Chopi, Kwikshop, and CNFA-supported traders.

What there was more of: Essentially all of those visited had in stock seed of hybrid maize. Some also had seed of open pollinated varieties (OPVs) of maize. A high percentage of the agro-dealers also had in stock supplies of agrichemicals, especially herbicides, pesticides and grain storage chemicals. They also had fertilizer, often in 5, 10 and 50 kg bags. A high percentage of the agro-dealers also had in stock some vegetable seed, though the range of vegetables and varieties available in any one agro-dealer was generally quite limited (e.g., 3 – 6 different vegetables and only one variety of each). Note that maize seed was even available in major supermarkets.

In summary, there seemed to be a good supply of maize seed, fertilizer and agri-chemicals available to farmers at a price, and vegetable seeds were also generally available.

What there was less of: One chain of agro-dealers (AGORA) did have some seed of groundnuts and beans, which they were apparently obtaining from Demeter seed company. Another chain (Kwikshop) had soybean seed. However, most of the other shops indicated that they did not have any legume seed in stock.

Agro-dealer: problem areas

Lack of key seed types : The assessment teams did not find certified cowpea or pigeon pea seed in any agro-dealer shops. Nor did teams find any cotton seed or rice seed, though one shop indicated they were expecting to receive some of the cotton seed that the government was importing from Zimbabwe. Lastly, the assessment teams did not find any certified seed of sorghum or pearl millet in any of the agro-dealer shops. In all cases, total lack of these seed types means that farmers have limited access to new varieties. Seed particularly of the legumes and sorghum/millets could and should be put on offer in very small quantities so that farmers can test new varieties (and then likely scale up seed multiplication themselves, if the variety is appreciated).

Agro-dealer placement: The other main issue farmers raised in terms of agro-dealers had to do with their placement (see Chapter III , Box 3.5 for geographic mapping of their placement). Within the SSSA, farmers indicated they had easy access to dealers in two of the three sites. However in Mlumbe, women farmers detailed how the journey to the nearest agro-dealer which would cost them 750 MWK and at least two hours. They also suggested a practical option in which the village headman might be licensed to sell inputs in their central market

place. Certainly geographic mapping tools can be better used to assess the suitability of agro-dealer placement—to maximize the potential number of clients reached (see Chapter III, Box 3.5).

Few legumes– except for FISP, sometimes

Box 4.2 Agro-dealer shortcomings (from farmers' point of view)

A) Placement. 'Too far in Mlumbe'

B) Very little legume seed

In general, in terms of formal sector supply, maize seed was abundantly available, and even fertilizer (at least according to agro-dealers own assessments). However, legume seed seemed to be inadequate, especially certified seed of pigeon pea and cowpea. Certainly it would have been difficult for a farmer with a voucher for legume seed to find appropriate materials in the agro-dealer shops. And in general, the range of crops for which seed was available in agro-dealer shops was quite limited.[7]

Local seed/grain market-supply 2011-2012

As we have seen, farmers routinely get large amount of their seed from local markets: they carefully seek out 'potential seed' from the grain supplies (Chapter III, Box 3.6). Further, as shown in Table 4.4, - farmers in the assessment zones intend to continue source part of their seed from the local market for the 2011-2012 season. Across sites, farmers will access less seed from the market in 2011-2012 than in the previous season 2010-2011 (27.6% versus 31.3% of total seed sown). Even in Chikhwawa, which experienced a prolonged drought, use of the local market for seed is projected to decline from the 2010-2011 season to the 2011-2012 ((44.1% versus 34.7% of all seed sown). The issue is whether supplies of local market seed can be expanded and improved to meet farmer needs and demand.

Market seed availability

Market traders, among the largest seed suppliers in each zone assessed, anticipated few/no problems with seed stocks for the 2011-2012 season: 84% indicated they had stocks which were the same or more than usual, for each of the crops they sell. There were isolated cases of 'shortage' at the time of the SSSA, for example, with sorghum and pearl millet seed at several of the Chikhwawa markets, but community interviews indicate that these crops are quickly declining in agricultural importance and that any needed seed can usually be obtained from neighbours.

[7] Note that the SSSA did not conduct an analysis of formal sector seed or other input prices.

This general availability of potential seed makes sense as the harvest was generally good 2010-2011 in all three sites, with the important exception of maize (see Table 2.6.) Also, the catchment areas serving each market are relatively wide. For instance, traders in the local market of Ngabu, Chikwawa indicated that they source grain and potential seed from :
a) other parts of Chikwawa east bank, Mitondo; b) other districts such as Ntcheu, Dedza, Lilongwe, and c) even from other countries—Mozambique.

Market seed quality

Hence, potential seed was available in all sites for the 2011-2012 season, but was the quality on offer acceptable? Overall quality looked good, across crops, but the SSSA team had some concerns about the quality of seed at a single market, in Chikwawa: simply, varieties were often mixed, and there was a good deal of extraneous material (twigs,stones). Market traders can be encouraged to put better quality of potential seed on offer (see Recommendations). However, it also likely that these poor public stocks contrast with those available in ' the back rooms' as often traders wait for prices to jump before making available their better stocks—those which could be used for sowing. This conscious hoarding makes business sense . The best products should be put on offer when they can fetch the best prices.[8] Note that traders themselves assessed the quality of seed available for 2011-2012 as being' or normal or better than normal in 92% of cases.

Market seed access/price

Finally, as with many seed security issues identified so far, one of the major constraints, if not *the* constraint- revolves around market price and farmers' purchasing power. Formal seed sector prices generally stay fairly constant. In contrast, market prices for potential seed, that is grain that has the variety and other quality characteristics that allow for sowing , can shoot up at critical sowing periods. The SSSA team collected information on prices of market seed, but overall sample sizes were too small to make definite conclusions. The team found prices for the legumes in October up 11-13% from the previous season (a rise which is not unusually elevated).

So, in brief, seed/grain market assessments showed potential seed to be immediately available in each area, or on order.[9] There was some concern about seed quality in a single site. Even prices were relatively stable—as linked to the good harvest of the previous season.

[8] Note that this hoarding behavior has implications for being able to extrapolate supplies available—at critical times. Most visible supplies, publically on offer in markets, will change dramatically within a week or two----and sowing becomes imminent.

[9] Post SSSA follow-up showed that potential seed stocks poured into markets mid—to late October.

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 (though purchase, barter, gift, or other). Community meetings at all sites involved upwards of 50 people, men and women, and the discussions were intense and interactive. Table 4.10 present the communities own assessment of those within their Traditional Authority (TA) who they deem seed secure for the upcoming season, 2011-2012. Seed security was assessed for the three to four most important crops as prioritized by the community group. The results surprised the assessment team. ***Except for maize (which has a high rate of failure), farming communities themselves assess they will be 70-100% seed secure for the upcoming season.***

Table 4.10: Community assessment of the % of its members who are seed secure for 2011-2012.

Crop	Kalembo, Balaka	Mlumbe, Zomba	Maseya,Chikwawa++
Maize	100	30-40+	70
Pigeonpea	100		
Sweet potatoes	100		
Cotton	100		
Groundnut		90	
Cassava		100	
Cowpea			100
Pearl millet			100

+ Because of poor maize performance, this community will shift to cassava in the coming season.

.

(note: Because GoM distributions were being anticipated at the time of the SSSA, the seed security estimate for maize might be influenced by the anticipated free gifts. In Table 4.5, farmers indicated they would expand land areas for 2012-2012, mostly sourcing on their own).

Summary: Acute Seed Security Findings

Multiple and diverse indicators suggest the seed security of Southern Malawi farmers in the short-term is quite stable.

From the farmer point of view, 2010-2012

1. For the 2010-2011 main growing season, farmers sowed 14.2% more seed than the 'normal' amounts in terms of overall quantities sown. In addition, crop by crop, 81.3%of farmers stated that they sowed the same amount or even more than usual. Crop yields also were rated generally quite good.

2. Farmers relied on local channels (home saved, local markets, seed from friends or kin) to access about 70% of their seed during the 2010-2011 season. 'Friends and kin' as a source were important primarily for the vegetatively-propagated crops (cassava and sweet potato), which has key implications for how these cuttings might move more widely and quickly.
3. For the 2010-2011 season seed from agro-dealers (17.2% of all seed sown) was accessed uniquely for maize, mustard and cotton. No legumes at all were bought from formal commercial channels within the SSSA sample.
4. For the 2010-2011 main growing season, aid (from government and NGOs) accounted for 12.7% of total seed sown, again with a clear focus on a select group of crops. Notable was that maize aid accounted for 16% of seed sown and groundnut seed aid which accounted for 18.4% of seed sown for this legume. Hence, even though these two crops are the focus of the Farm Input Supply Program (FISP), farmers accessed upwards of 80% of seed of these targeted crops on their own.
5. Local markets were a crucial source for ensuring seed security (31.3% of seed sown) during 2010-2011, but were particularly important in higher stress areas. For instance, In drought-affected Chikhwawa, 56% of the maize seed and 79% of the pigeon pea seed sown was bought from local markets.

6. The reported plans of farmers for the 2011-2012 main season show more of the positive same. Almost 90% of farmers plan to maintain or increase the amounts sown across crops, and by significant margins (+27.5%).

7. These positive trends should not obscure the compelling problem farmers face in terms of finances. Cash needs for seed purchase in Chikhwawa illustrate the point. Farmers spent 2049 MWK for the 2010-2011 season and calculate 2795.2 MWK in seed-related cash needs for 2011-2012 (a 36% increase-largely tied to drought-related loss)[10].

8. From the farmer point of view, the rationale for using less seed or more seed (a general proxy for decreasing or expanding land area) is key. During 2010-2011 almost 50% of farmers planted less because of money constraints. Seed availability was mentioned as a constraint by very few farmers (3-5%) and only in reference to select legumes and cassava cuttings. The rationale for planting more is also clearcut: farmers expand seed use when they get access to more or better land, and especially in response to emerging commercial opportunities.

[10] At the time, the official exchange rate was approximately 160 MWK to 1 US$

On the supply side, 2010-2012

On the seed supply side for 2010-2012 seasons, several findings are to be remarked

9. Agro-dealers themselves indicated no shortage of their normal supplies--- maize, vegetable seed, fertilizer, storage chemicals—to be put on offer. While many in the regions had not yet received stocks from various centralized storage depots at the time of the SSSA, there was no indication that overall supply could not meet farmer demand.

10. For seed supply from formal agro-dealers, other constraints emerged:
    i. geographic access : Farmers cited good access to agro-dealers in only two of the three sites. Those in Mlumbe (Zomba) felt distances just too far. Extensive analyses of agro-dealer placement in the Central region show similar constraints. For those relying on foot transport, 48% are within a one-hour walk to an agro-dealer shop).

    ii. specific varieties desired were sometimes not on offer (for non-maize) .Agro-dealers in all sites sampled supplied maize and vegetable seed. However, legume seed was seen on offer only tied to the FISP program. This lack of legume seed is a serious gap.)

11. The seed available on the local market was plentiful . Generally, it was assessed by farmers and traders to be good to normal quality. However, the SSSA team felt quality was especially an issue in the drought-prone region of Chikhwawa (lots of broken and immature seed/grain in the supply).

Community summary:

12. Overall, communities themselves emphasized (via focus group discussions) that they are 70-100% seed secure across crops (although some are shifting away from maize, due to its repeated failure). Their #1 concern is around money. However, there were isolated but repeated complaints about the difficulty in accessing new and good legume seed (see below, *chronic seed security* issues).

13. Incentives for expanding seed use, and extending land area are especially linked to the emergence of better developed markets for farmer products.

CHRONIC SEED SYSTEM CONCERNS AND EMERGING OPPORTUNITIES

We now move to examining more systemic trends in Southern Malawi agricultural and seed security. Community -level assessments were done in all 3 sites and involved a range of methods: community meetings, special focus group discussions with women, and 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 processing and agro-enterprise, seed aid delivery, access to new varieties and use of inorganic and organic fertilizers.

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. The analysis shows that there has been some dynamism in sources—but mostly for maize. In many cases, seed source 'innovations are not sustainable—hence NGOs give new varieties one-off , or governments give free aid. New legume varieties in general are hard to find. Note that Chapter III highlighted specific problems with the seed/cutting supply systems of cotton, rice, and cassava (Boxes 3.1, 3.2)

Figure 4.5 Chikwawa: Maize seed sources

Figure 4.5 shows the community mapping of maize seed sources in Maseya, Chikwawa. In 2005, they indicate the 'local market' as their first most important source, followed by their own stocks and aid. The map six years later, 2011, shows a great deal of dynamism, both positive and perhaps negative. Agro-dealers have entered the arena, but NGO support , and especially casual labor (*ganyu)* have become more prominent. Interestingly, the local market is still considered farmers'#1 source for maize seed.

2011 2005

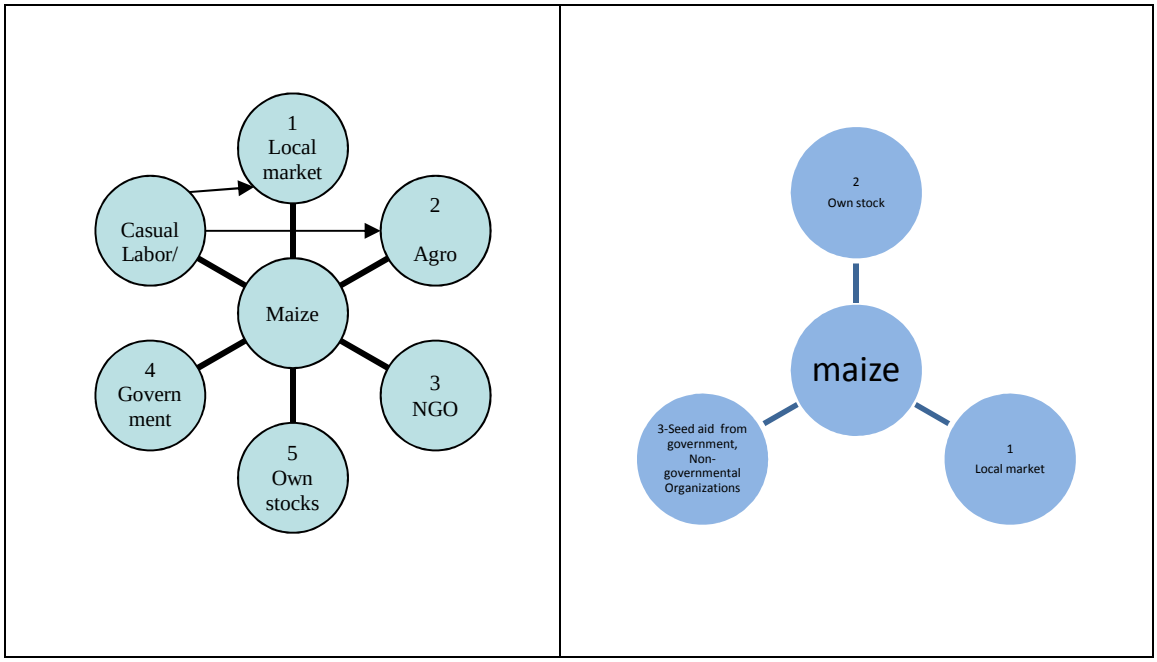


Figure 4.6 Chikwawa Cowpea:

Figure 4.6 show the same community- Maseya- mapping, but for cowpea. There has been little change in seed sources since 2005, except more reliance on social networks. Farmers' choice of channels for sourcing cowpea seed remain limited.

2011 2005

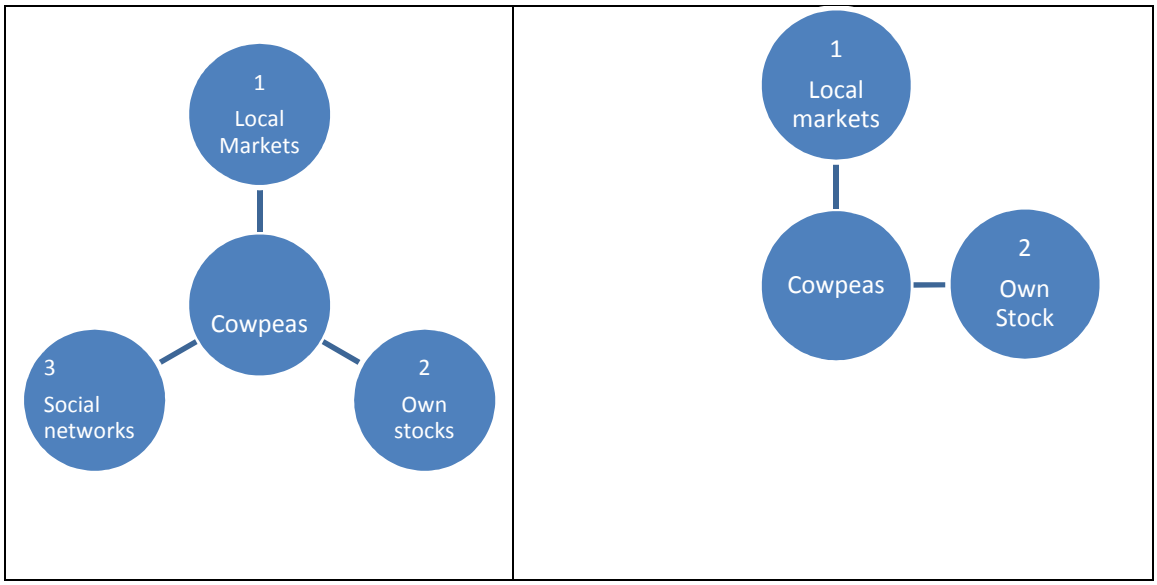


Figure 4.7 Balaka, Cotton

The same type of seed mapping took place in the community of Kalembo, Balaka. Cotton production is key for farmers' being able to generate income. As the figure shows, farmers are tied to private companies or government distributions to get seed. (There seem to be no independent outlets?)

2011

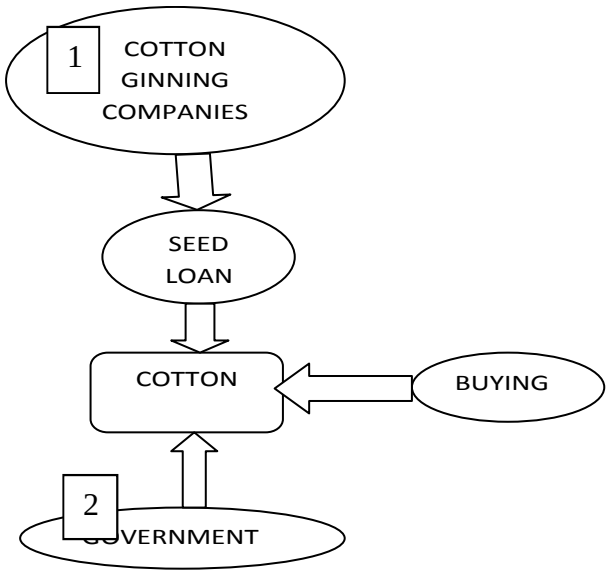
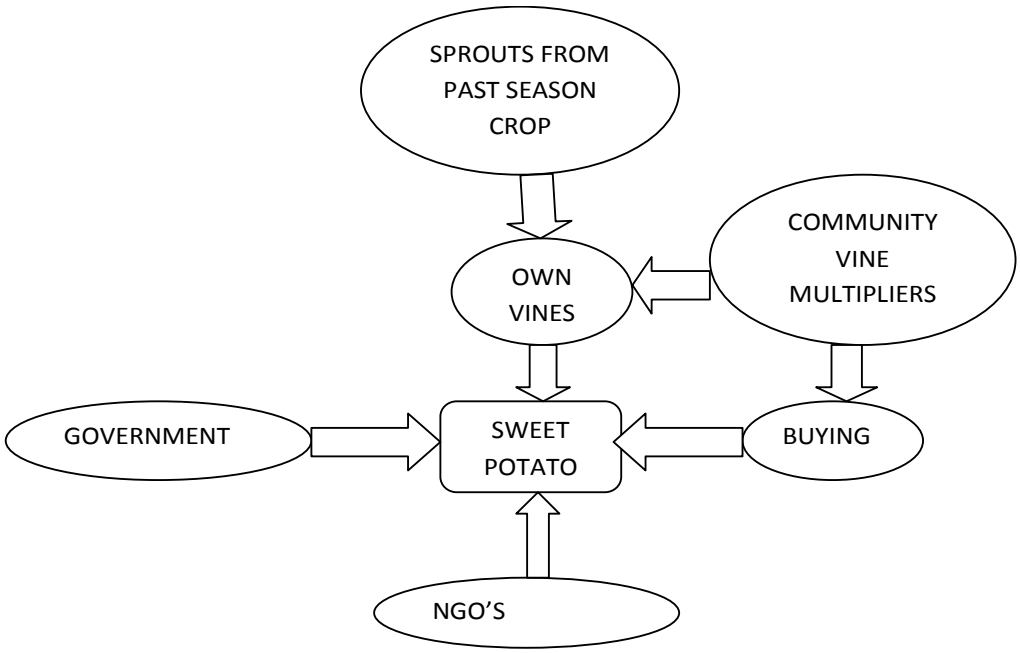


Figure 4.8 Balaka, sweet potatoes

Figure 4.8 maps the 2011 seed sourcing for sweet potatoes in Kalembo, Balaka . As the community indicates, they use vines from their own fields, or obtain via community multipliers, NGOs or government initiatives.

2011



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. Results are presented below for two communities , Kalembo (Balaka) and Maseya (Chikwawa) . In each case, a fair range of crops is grown in each zone, with several routinely sold to generate income. However, transformation levels overall are low.

Table 4.11: Malawi: Kalembo Balaka , Diversity of crops, but --little transformation

Crop	Importance for food	Importance for Income	Transformation?
Maize	XXX		Brew, flour
Cotton		XXX	Lint for mattresses
Groundnuts		XXX	Flour, paste
Pigeon pea		XXX	
Cowpea			
Tobacco			
Greengrams			
Bambara nuts			
Cassava	XXX		Flour, mandazi
Sweet potatoes	XXX		Porridge,flour
Beans			

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

Table 4.12: Malawi : Maseya, Chikwawa Diversity of crops, but – low levels of transformation.

Crop	Use for Food (H,***, M**, or L *)	Use for Income (H, M, or L)	Any transformation? Specify
Maize	***		Flour, cakes, samp, thobwa,
Cotton		***	
Pearl millet	**		Balls ,flour , samp , sweet beer (thobwa)
Sorghum	**		Balls, samp,
Rice	**	**	Polished rice grain ,porridge
Vegetables		***	Relish ,salads, sold raw
Finger Millet	***	*	Sweet beer
Groundnuts	***		Powder, porridge , cakes ,sweets

X indicates relative levels of importance, with more X's being relatively more important

Note that despite these low levels of transformation (that is, not much money), the number of farmers engaged is noteworthy. In one women's group meeting, in Nkanda, Zomba, 16 out of the 17 women (94%) were involved in selling something individually: fritters/mandazi, sweet beer, snuff, samosas, cooking oil, bananas, sugar—and one was involved in sewing. So the desire for enterprise is high.

The SSSA teams did also note limited agro-enterprise on a more cooperative scale. The instances found—for group seed multiplication (Box 4.3) and cassava processing (Box 4.4) looked interesting. Both, however, had been subsidized for years and seemed to have business development plans which still required considerable refinement. [11]

Box 4.3 Seed multiplication as a business

The Kunyinda Seed Growers Association was formed in Chikwawa in 2004. It has received extensive training—in seed multiplication, governance and management and even agro-enterprise development. And it has been able to produce very impressive quantities of seed: for instance , in 2010/11 alone , 32mt of pearl millet, 15mt sorghum (along with modest quantities of cowpeas and pigeon peas).

But the group' s key challenge is in marketing: they lack a clear marketing plan!

Seed multiplication HAS to be run as a business.

Farmer's store of sorghum heads to be used as seed.

[11] The SSSA team did visit One Village One Product (OVOP) offices in Zomba. This GoM program under the Ministry of Trade and Industry is working on value-addition initiatives. In the SSSA districts, the OPOV work included The Likangala Rice Processing Cooperative and the Bwaila Meat and Milk Producers and Marketing Cooperatives. However, the SSSA was unable to visit either of these.

Box 4.4 Sustainable processing?

The Chinangwa Mbatata Roots and Tubers (CMRTE) project has been in existence since 1999.

In theory, it is laudable example of product processing, transforming cassava tubers into high quality cassava flour (HQCF) for use in the confectionary industry (for breads, biscuits, etc.). CMRTE has acquired new equipment (grater and press) for processing HQCF.

In practice, practice, the project continues to be subsidized in its newest phase (by two donors).

At some point, a development project has to transition into a commercial enterprise. Recent recruitments of production and marketing officers are good signs.

New varieties

Continuing to search for innovation, we move to the issue of new varieties. Within the context of assessing seed security, it is especially important to consider new variety access. Such varieties can be an economical way to increase production quickly. Figure 4.9 and Table 4.13 show the extent of variety introductions 'during the last five years' (approximately the period 2006-2011) within the site samples . Overall, an impressive 70.6 % of farmers reported that they had recently accessed new varieties (although whether these are 'modern varieties' or new local varieties cannot be determined). The varieties have been accessed through multiple channels, with a heavy weight toward government (via free distribution), agro-dealers, or NGO/FAO.

Figure 4.9. Malawi Farmers' sources of new varieties, 2006-2011

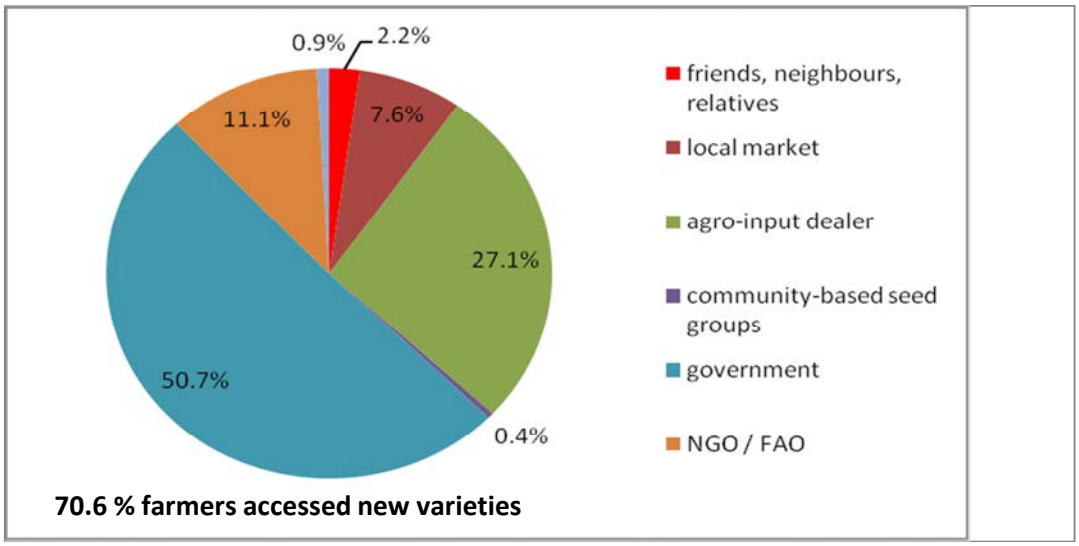


Table: 4.13: Malawi Farmer variety introductions, by crop, 2006-2011

Crop	**variety introductions**	
	N	**%**
Maize	174	78
Millets	3	1
Rice	5	2
Sweet potato	2	<1
Irish potato	1	<1
Groundnut	8	4
Common beans	2	<1
Pigeon pea	13	6
Mustard	7	3
Cotton	8	4
Total crops	**223**	**100**

Note that new varieties consisted overwhelming of maize. New varieties of legumes—key for nutrition and soil fertility enhancement, comprised only 10.3% of the new accession—across crops: pigeon pea, groundnut and common bean. New varieties of other legumes—such as cowpea, soybean—were not mentioned by farmers at all. Clearly there is a need for developing innovative ways of getting new varieties into farmers' hands (Box 4.5). As one suggestion: if hybrid maize seed can be sold across supermarkets in Malawi, why not legume seed also. NASFAM already sells beans (for food?) in packets in a number of supermarkets. Could this be expanded explicitly to seed?

Box 4.5: Innovative channels for getting new varieties OUT

Pigeon pea, beans, cowpea, groundnut, soybean….

Malawian farmers need better access to new varieties—and especially to the legumes. No sustainable conduit currently gives them easy seed access—except to maize and vegetable seed

Why not build ***multiple channels*** to render seed accessible to ALL:

- Small seed packs need to be offered by seed companies
- Legume seed needs be sold in normal venues (rural shops, supermarkets)
- Seed loan groups should be formed, but with quality controls and clear marketing plans
- Agro-enterprise groups formed- around seed

There are wonderful possibilities for enhancing farmers' access to new varieties ---quickly.

Manure/Compost, Fertilizer + Storage Chemical Use

Select input use was also examined during the Malawi SSSA as complement to the seed security analysis. This included examining farmers' use of a) organic fertilizer: manure and compost; b) inorganic fertilizer ; and c) storage chemical use .

Manure/Compost Use

In terms of compost or manure, the large majority of farmers (59.4 %for 2010-2011 and 65.2% for 2011-2012) use some for both seasons (figures 4.10 and 4.11). Types used were consistent across seasons: mostly small livestock manure (sheep, goats) for 34-36% of cases and crop/field residue for 32-33% cases. Those who did not use manure/compost suggested they were 'not available', 'not necessary' or that they 'did not know how to use'(each in 23-26% of cases).

For those using such organic fertilizer overwhelming priority was given to applying this input on maize—to the near exclusion of other crops (Table 4.14).

Figure 4.10. Manure/compost use 2010-2011 (n= 180 farmers)

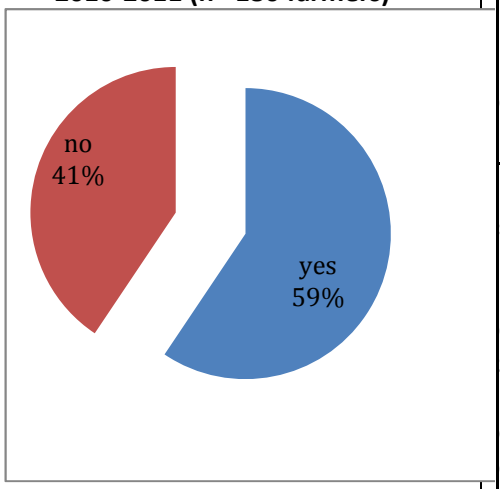


Figure 4.11. Manure/compost use 2011-2012 (n= 178 farmers)

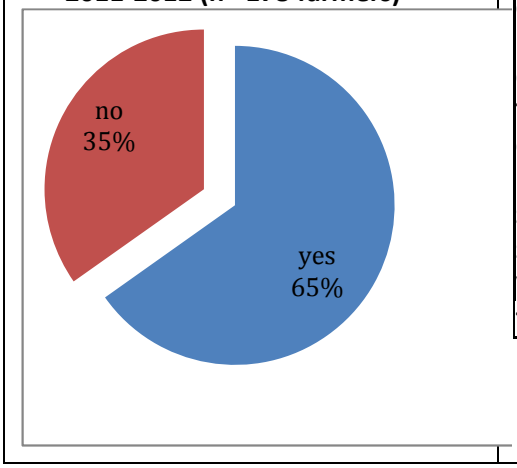


Table 4.14: Crops to which manure/compost were applied.

If using compost/manure, on which crops?				
Crop	2010-2011		next season: 2011-2012	
	n	%	n	%
Maize	**107**	**85.6%**	**112**	**86.8%**
sorghum	2	1.6%	2	1.6%
Millets	0	0.0%	0	0.0%
Rice	0	0.0%	0	0.0%
Cassava	0	0.0%	0	0.0%
Sweet potato	0	0.0%	0	0.0%
Irish potato	0	0.0%	0	0.0%
Groundnut	4	3.2%	4	3.1%
Common beans	1	0.8%	1	0.8%
Cowpea	0	0.0%	0	0.0%
Pigeon pea	8	6.4%	6	4.7%
Green Grams	0	0.0%	0	0.0%
Mustard	3	2.4%	4	3.1%
Cotton	0	0.0%	0	0.0%
Tobacco	0	0.0%	0	0.0%
Chickpeas	0	0.0%	0	0.0%
Pumpkin	0	0.0%	0	0.0%
Soya bean	0	0.0%	0	0.0%
Sesame	0	0.0%	0	0.0%
Velvet beans	0	0.0%	0	0.0%
Total crops	125	100.0%	129	100.0%

Mineral Fertilizer use

A large number of farmers in the sample also used mineral fertilizers, 79.8% during the 2010-2011 season (figure 4.12) and 85.6%% projected for the 2011-2012 season (figure 4.13). Application went, again, overwhelmingly to maize to the near exclusion of other crops (Table 4.15).

For the few not using mineral fertilizer, the majority said that 'it is too expensive'(for 77-80% of responses across seasons). Availability seemed to be a minor problem. Only three farmers each season said that fertilizers were not available.

A range of types were cited as being used, especially Urea and 23:21:0+45.

Figure 4.12. Mineral fertilizer use 2010-2011 (N=178 farmers)

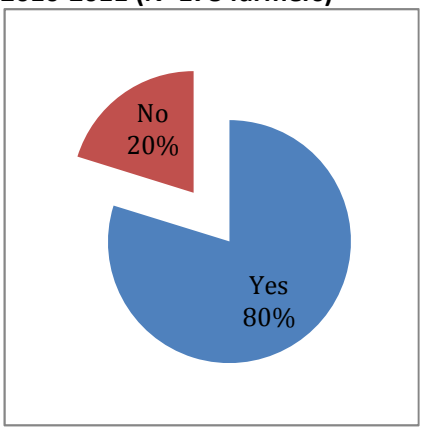


Figure 4.13. Mineral Fertilizer use-2011-2012 (N=180 farmers)

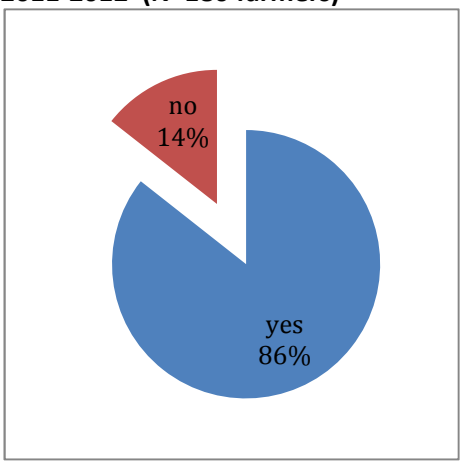


Table 4.15: Crops to which mineral fertilizer were applied

If using fertilizer, on which crops?				
Crop	Current/most recent season		next season	
	N	%	N	%
Maize	**140**	**89.7%**	**152**	**91.6%**
Sorghum	0	0.0%	0	0.0%
Millets	0	0.0%	0	0.0%
Rice	6	3.8%	6	3.6%
Cassava	0	0.0%	0	0.0%
Sweet potato	0	0.0%	0	0.0%
Irish potato	0	0.0%	0	0.0%
Groundnut	0	0.0%	0	0.0%
Common beans	1	0.6%	0	0.0%
Cowpea	0	0.0%	0	0.0%
Pigeon pea	4	2.6%	4	2.4%
Green Grams	0	0.0%	0	0.0%
Mustard	5	3.2%	4	2.4%
Cotton	0	0.0%	0	0.0%
Tobacco	0	0.0%	0	0.0%
Chickpeas	0	0.0%	0	0.0%
Pumpkin	0	0.0%	0	0.0%
Soya bean	0	0.0%	0	0.0%
Sesame	0	0.0%	0	0.0%
velvet beans	0	0.0%	0	0.0%
Total crops	156	100.0%	166	100.0%

Storage Chemical Use – 2010-2011 and 2011-2012 seasons

As a third major input the SSSA team reviewed storage chemical use. The majority used such chemicals, but here the SSSA team found year to year variation: 57% for 2010-2011 and 73% projected for 2011-2012. Only three crops were targeted for storage chemicals: maize, pigeon pea and groundnut, again with maize dominating (see table 4.16).

Main reasons for not using them across seasons were three: first, farmers considered them 'too expensive (45-47% responses), then some farmers deemed them not necessary (20-22% of responses) and a smaller portion said they were 'not available' (6-8% of responses)

In all of the above, one can say very little about efficiency of use, a topic that merits a great deal more analysis.

Figure 4.14. Storage Chemicals 2010-2011 (n=180 farmers)

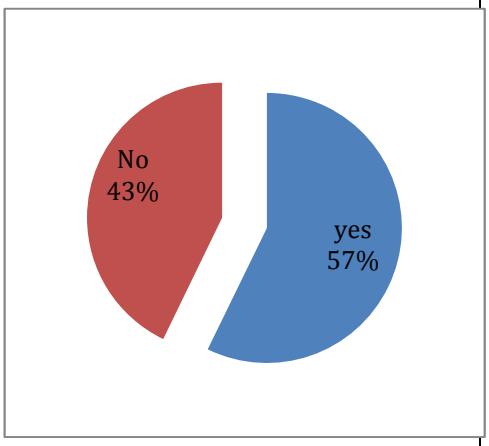


Figure 4.15. Storage Chemicals 2011-2012 (N=179 farmers)

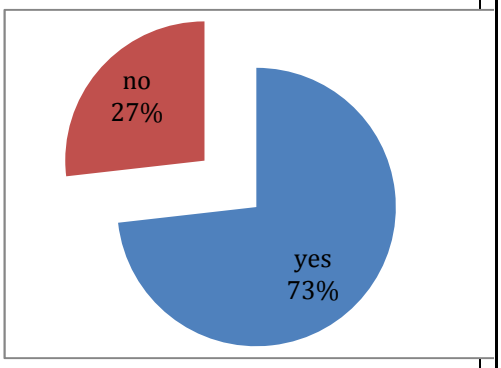


Table 4.16: Crops to which storage chemicals were applied

If using storage chemicals, on which crops?				
Crop	**2010-2011**		**2011-2012**	
	#	%	#	%
Maize	**101**	**72.7%**	**127**	**75.6%**
Sorghum	1	0.7%	2	1.2%
Millets	1	0.7%	1	0.6%
Rice	0	0.0%	0	0.0%
Cassava	0	0.0%	0	0.0%
Sweet potato	0	0.0%	0	0.0%
Irish potato	0	0.0%	0	0.0%
Groundnut	0	0.0%	0	0.0%
Common beans	13	9.4%	14	8.3%
Cowpea	0	0.0%	0	0.0%
Pigeon pea	23	16.5%	24	14.3%
Green Grams	0	0.0%	0	0.0%
Mustard	0	0.0%	0	0.0%
Cotton	0	0.0%	0	0.0%
Tobacco	0	0.0%	0	0.0%
Chickpeas	0	0.0%	0	0.0%
Pumpkin	0	0.0%	0	0.0%
Soya bean	0	0.0%	0	0.0%
Sesame	0	0.0%	0	0.0%
Velvet beans	0	0.0%	0	0.0%
Total crops	139	100.0%	168	100.0%

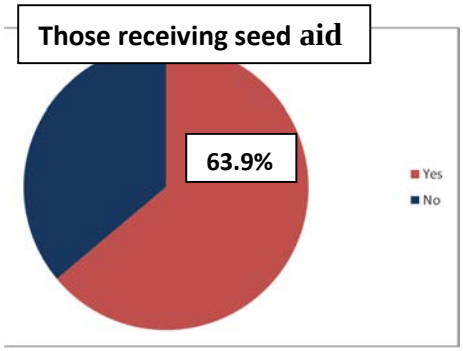
Note that total is higher than number of farmers, as each farmer using fertilizer could name up to 3 crops.

Seed Aid

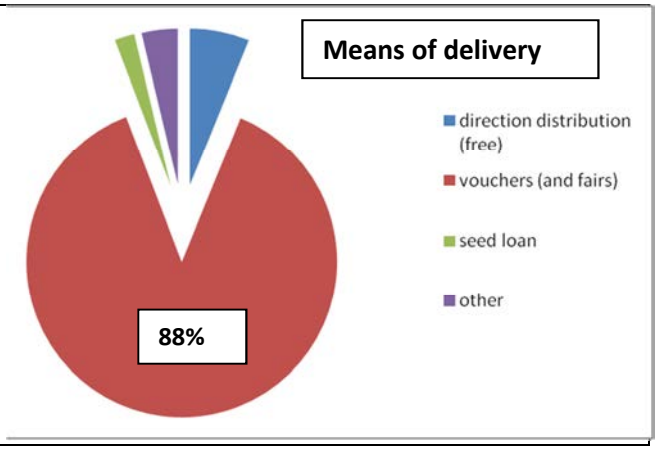
Finally, as the last 'input' we look at seed aid, which has been an important form of assistance in Southern Malawi. Here we include both emergency assistance and developmental aid, as farmers themselves often cannot make the distinction.

The SSSA results show that about three-fifths of the total population (63.9%) have received seed aid sometime between 2006-20 11. In this period, they have received it a mean of 2.5 times (50% of main seasons), with some farmers having received aid up to 6 times, or once every year (Figure 4.16). The means of delivery has generally been linked to voucher use of the GoM FISP program (Figure 4.17).

Figures 4.16 and 4.17. Seed aid: 2006-2011



Range: 0-6 times per HH
Mean 2.5 times



Comparing possible differences in seed security-related issues:

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

The SSSA teams also examined possible differences within populations, for all issues above, for example, seed sources used, quantities planted, use of new varieties, manure/compost, storage chemicals, access to seed aid.

Analyses were done by two major variables: sex of household head (male or female-headed households) and area under cultivation (below 1/2 acre, ½ -1 acre, 1-2 acres, over 2 acres).

- In terms of M/F headed households, there was one significant difference. For both seasons, female-headed households tended to be more stable in quantities sown with fewer experiencing downward trends.

- In terms of households with diverse land areas available for cultivation, there were no significant differences among the seed-security-related issues considered.

Table 4.17: Differences in select seed security issues among: a) M/F headed households and b) households cultivating different land areas?

Issue	Differences? (t-tests)
Households: Female and Male- headed	
sowing amounts 2010-2011	*yes- women more stable (men downward)*
sowing amounts 2011-2012	*yes (but less strong significance)*
use compost/manure	*no*
use of mineral fertilizer	*no*
use new varieties?	*no*
times received seed aid?	*no*
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	*no*
use of new varieties	*no*
times received seed aid	*no*

Summary: Chronic Seed Security Findings and Emerging Opportunities

The review of medium-term trends in seed security in Southern Malawi shows some qualified moves forward as well as important and key bottlenecks.

Mixed (qualified) factors: positive and negative

1. New variety access within the survey area has been impressive, with almost 71% of farmers indicating they accessed a new variety in the period 2006−2011. However 78% of these new accessions have been of maize varieties, with negligible gains for the other 9 crops cited.

2. Inorganic (chemical fertilizer) has/will be employed by 80-85% of farmers during the two seasons 2010-2011 and 2011-2012. Organic fertilizer (compost/manure) during the same period was/will be used by 59-65% of households. Similarly, the majority of households use storage chemicals (57%and 73% for the two seasons). However, for both seasons and all three types of inputs, 75-92% of the applications are associated with maize.

3. At every SSSA site, farmers cited problems accessing new legume varieties (pigeon pea, groundnuts , soybeans and cowpeas). On a positive note, NASFAM packets of beans (which could potentially be used as seed) were on offer in several supermarkets.

4. Some important decentralized seed multiplication was noted during the SSSA, for instance a group in Chikwawa which had multiplied 35MT of pearl millet and 16 MT of sorghum seed. However, no clear markets had yet been identified for this seed supply.

Negative and ongoing stresses

5. There is very little agricultural processing in rural communities – there was production of flours, pastes and beer, but not much more. This means that farmers have been unable to reap the benefits of value addition to raw agricultural products. For instance, the SSSA team identified only a single cassava processor, in Domasi (Zomba region) and this group was supported by external aid .

6. Seed system channels have generally remained static over the least five years, except for maize and vegetable seed.

7. Cassava cuttings are extremely hard to find, except for small quantities moved through social networks (kin, friends, neighbours).

8. There seems to be no formal cotton seed chain in place in Malawi. Some seed is brought in from companies in Zimbabwe. However, much of the seed is purchased from farmers who may also mix varieties. This (lowish?) quality standard poses an issue for a crop with such a high commercial stature. A similar situation seems to exist for rice. No certified seed available. Also very little on offer even in local

markets. (NB: in a subsequent discussion, the Department of Agricultural Extension Services in Malawi has indicated that the government has initiated plans with at least one private sector company to produce seed of adapted cotton varieties for Malawi to address this issue.)

9. Seed aid, that is free distribution of seed as part of emergency response and development initiatives, has been conducted on a large scale, with 64% the Southern Malawi population having received such aid an average of 2.5 times over the five years. Such aid can promote dependency: some households have received seed assistance 6 times in 5 years.

10. Female-headed households do not face very different seed security concerns from male-headed ones. In fact, their sowing patterns are more stable, whereas men's more often fluctuate downwards. No significant seed security-related issues were found among households cultivating different land areas.

So all in all, this is a highly subsidized, maize focused seed security context. There is very little innovation among the large range of legume crops, which are key for nutrition and soil fertility. There is only modest agro-processing and organized marketing.

V. OVERALL RECOMMENDATIONS: ACROSS SITES

The opportunity for the SSSA team to conduct assessments in diverse sites provided the field teams a useful perspective on seed security across regions of Southern Malawi.

Site-specific recommendations have been included in each site report (jmkumbira@walamalawi.org) . Problems and related action plans for each site were developed by the respective SSSA teams and are provided in VII. Annex.

Below is a set of 10 key recommendations which are applicable across all sites. These are divided between recommendations for the acute stress (emergency) period as well as those pertaining to medium-term actions.

General Overview

Seed Availability *per se*, was generally not identified as the major problem in any of the assessed sites . Rather access to seed, having the funds to buy seed , was the key constraint (and especially in Chikhwawa). However, it is noteworthy that legume seed of new varieties have been especially hard for small farmers to locate.

Most seed security problems encountered in all assessment sites were long term (chronic) ones. Any response in the short term should aim to be linked to longer-term recovery and development. As one example, this might including linking farmers more efficiently to sources of new varieties, especially for the legumes, even in the early recovery phase.

The varied site-specific SSSAs have shown that 'one size does not fit all'. The three sites assessed had different problems and challenges. A blanket response, such as giving free seed, or conducting standard seed vouchers may not solve problems with the specificity needed. Interventions need to be tailored to specific seed security constraints and opportunities in the different locations. One key factor to consider in this process is the access of local farmers to competitive and reliable sales outlets for seed and other agricultural inputs.

Seed security: immediate responses needed

1. The major urgent problems center around farmers having access to seed (point #1 above). Emergency inventions should be geared to addressing access problems. Vouchers linking farmers to local markets and other innovations are important immediate aid options which give farmers increased access to crops and varieties and other innovations of their choice.

2. Given the specific constraints found in Southern Malawi, we suggest fairs be hosted, but with a specific slant to help bolster diversity and nutrition in a region with is 'maize-rich', but poor in most other agricultural innovations. Newly labeled as DiNER vouchers and fairs (DiNER= Diversity and Nutrition for Enhancing Resilience),

we recommend that DiNER fairs aim to put on be used to increase access to agricultural elements which are particularly in short supply in the Southern region, including, but not limited to:

a. New varieties, especially of legumes
b. Local + traditional crops (vegetables, medicinal herbs)
c. Fruit trees and other types of trees
d. Small livestock: chicken, guinea fowl, doves, turkeys, rabbits

The potential for increasing resilience through diversity can be seen in Table 2.6 where in any given year and location, poor performance of some crops can be greatly compensated for by good performance in other crops – even in the same difficult seasons.

Seed security: medium-term responses needed

There is need for a broad-based rethinking on how to improve the seed security of small holder farmers in Southern Malawi. Below, we suggest first set of 'major areas for priority action'.

3. There is a real need to get more legumes into smallholder farming systems. This has to start with the scaling up of Breeder and Basic Seed. While Breeder Seed needs to remain under the direct domain of NARS/DARS, we suggest that Foundation/Basic Seed Multipliers be diversified to include private as well as public sector actors. Such diversification should result in greater volumes of basic legume seed being produced and at a cheaper cost (including, seed production and marketing by farmer groups).

4. Decentralized seed production needs to become a more strategic and effective force in serving farmers as the formal seed sector will never be able to handle a) the range of crops needed for stress zones; nor b) the range of varieties. At this point, the decentralized seed multiplication initiatives seems to be having very modest (near nil) impact in the Southern Malawi zones. As a general recommendation, sustainable decentralized seed production models need to be confirmed for Southern Malawi and scaled-up, especially for the legumes and vegetatively-propagated crops.

<u>Tied to #4</u>

4.3 Decentralized seed multiplication groups need to develop an assessment of the cost-effectiveness of their production and delivery strategy. They should be encouraged to produce only if a) viable markets are identified and b) their own agro-enterprise and marketing skills have been enhanced and c) they have a realistic and robust business plan.

4.4 Links need to be specifically catalyzed to tie decentralized seed producers with continuing and new sources of germplasm.

5. **Cotton seed systems**: There are a number of cotton varieties that have been released in Malawi, and farmers seem to like them. However, at present there does not seem to be any commercial system to produce significant amounts of certified seed of these varieties in Malawi (This issue is explained further in Annex 1.1). The government of Malawi is currently making a major push to promote cotton production. But if this initiative is to be effective, it is very important that

simultaneous efforts are made to produce seed of cotton varieties that are adapted to the various agro-ecological zones in which cotton is produced, and that this seed becomes available to the farmers that need/want it on a sustainable basis.

6. **Seed systems for vegetatively propagated crops:** For vegetatively propagated crops, decentralized farmer- based "seed" production systems are probably the most effective (see further explanation in Annex 1.2). In order to ensure broad access and be effective, the producer-groups should be plentiful and well-distributed throughout the target area. They should also be well-trained in how to maintain disease-free populations, be closely linked to reliable sources of new varieties and disease-free parent material (probably research institutions) and each group needs to have a well developed and robust business plan.

7. Delivery mechanisms for giving all farmers regular access to new varieties need to be intensified. Sale through agro-dealers provides only one venue but should be encouraged, especially in small pack sizes (100, 200, 500 g). Sale in regular country stores, open markets (also point #10 below) or even supermarkets (with proper labeling) might be considered. In addition, agro-enterprise groups and seed loan groups (with clear marketing plans) might be formed around seed (point 10 below). In all cases, enhanced delivery options need to be complemented by vigorous media campaigns helping farmers to make informed decisions about whether to use the new materials. This latter process could benefit from the large number of "farm radio" projects and programs that are operating in Malawi.

8. Given that local markets (and their traders) are important for farmers' seed supply, more attention should be given to encouraging that these open seed/grain markets supply the kinds of potential seed farmers need. As one point of departure, seed/grain traders could be powerful partners in helping to move *new modern varieties* widely, within and among farming communities (linked to point 7). Traders might also be linked to options for safeguarding and improving the quality of seed they put on offer. This could involve: linking traders to credible sources of good quality seed; working with them on techniques of seed bulking; recommending options for separate and improved seed storage.

Ultimately, non-seed issues will drive the seed security sector. Food and livelihood security generally, are linked to the financial capacity of farmers. The last two recommendations focus on needs for: a) generating cash, through Village Savings and Loans (VSL) Programs and b) developing agro-enterprise market chains.

9. **Village Saving and Loan Programs (VSL)**: VSL are described in more detail in Annex 1.3. In a relatively short time (12 – 24 months) the VSL funds are often large enough to allow members to borrow enough money to access key agricultural inputs like seed and sometimes fertilizer or pesticides. In regards to having secure access to seed and other important inputs in the future, VSL should be promoted in order overcome the most common constraint – which is access to cash among the poor.

10. **Rural agro-enterprises** are mechanisms of potential impact that are currently severely underdeveloped. Farmers are selling their agricultural produce in raw form, or only slightly modified as in the case of maize and cassava, sold as flour. As a start in promoting agro-enterprise development, profitable business models that work for smallholder farmers need to be tested and then scaled-up (see Annex 1.4 for suggestions on methodology). Ultimately, linking smallholder farmers effectively to

markets is the best solution to increase incomes and both seed and food security, and also to create the demand that will support crop breeding and private sector production of good seed and/or planting materials of improved crop varieties.

Overall, this SSSA recommends a move away from short-term, gap-filling interventions and towards strategic investment in smallholder –driven variety, seed, and agricultural marketing systems. Simultaneously, it suggests a sharpened focus on food security, which particularly emphasizes crop diversification and nutritional enhancement.

Annex 1: Technical Issues related to Recommendations

1. The cotton seed issue developed from the fact that cotton ginning companies were distributing seed to the farmers they worked with (either subsidized, or for cash or credit). Seed was obtained as a by-product of their ginning process and then sold back to farmers. This might have been fine, except that different companies distributed different varieties, and at harvest time farmers often sold at least part of their cotton crop to the buyers that were paying the highest prices – not necessarily to the cotton company that had provided them with the seed. Thus when cotton companies ginned the cotton harvest, the seed that was extracted was not necessarily from the same variety that the company had distributed. This resulted in farmers receiving cotton seed of mixed varieties, and not always ones that were adapted to their areas. During the course of the study it was observed that while several cotton varieties had been released in Malawi, there did not seem to be any companies that were actually producing seed of these varieties. There was some seed of pure varieties purchased from Zimbabwe and distributed to farmers, but farmers indicated that even when they used this seed, the varieties were not always adapted to their agro-ecological zones.

2. Vegetatively- propagated crops like cassava and sweet potato require specialized production systems for planting materials. This is because the planting materials are: bulky to transport; have a relatively short "shelf-life" once they have been cut off the parent plant; and they can carry with them any disease that the parent plant has. In addition, because they have exactly the same genetic make-up as the parent plants, they are easy for the farmers themselves to maintain and multiply, once they have them – and this in not attractive to commercial companies. Thus efficient decentralized farmer-based systems for the production of planting materials are likely to be more effective than relying on commercial companies to produce, distribute and market the planting materials.

3. Village Savings and loan (VSL) programs differ across agencies, but have some common fundamentals. They are "accumulating savings and credit" programs. In these programs, small groups of 10 – 20 individuals join together. They agree on an amount that they are going to save regularly, and when they have accumulated sufficient capital they start making small loans to members of the group. In principle, the total amount of savings is never loaned out to a single individual at one time – in case of defaults. All loans are paid back at an agreed interest rate (usually 10 – 20%/month), so between the saving and the interest from the repayments, the funds tend to grow quite rapidly, even when the initial savings amount was quite small. At the end of 12 months the groups usually do a "share-out", returning to each individual the amount they had contributed in savings, plus the associated interest. This amounts to an annual audit. The groups then usually agree on what amount of the share-out they will return to the "kitty", elect new officers, and start the cycle again. These VSL programs are extremely effective in helping the very poor accumulate both savings and assets. The savings and access to credit provide a hugely important buffer against adversity and allow households to protect productive assets. The VSLs have proven to be a very effective way to generate cash – or access to credit – for even the poorest rural households.

4. in regards to agro-enterprise in Malawi, transformation of cassava has been but one market chain of interest. USAID is focusing on both dairy and legume value chains as other options for smallholder farmers. However, the key thing that is needed in order to link smallholder farmers to markets in sustainable and equitable ways is capacity building for the farmers in a range of key skill sets (see "Preparing Farmer Groups to Engage

Successfully with Markets. www.crs.org/publications). As part of this process, farmers should be involved in a "market opportunity identification" process to identify key products that they can produce and market effectively in their communities. They also need to understand the value chains associated with those products so that they can decide at which point they should enter the value chain. Lastly, they need to be organized and have a well developed business plan to assure success of their enterprise(s). Ultimately, generating more income will allow smallholder farmers to make larger investments in increasing their productivity (purchasing the necessary inputs and/or labor) and diversifying their production systems and enterprises.

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VII. ANNEX: ACTION PLANS

SEED SECURITY : ACTION PLANS

- Action Plan : Zomba (Mlumbe)
- Action Plan : Balaka (Kalembo)
- Action Plan : Chikwawa (Maseya)

Seed System Security Assessment (SSSA) Action Plan Zomba- Mlumbe -2011:

PROBLEM	SHORT TERM RESPONSE	MEDIUM to LONGER –TERM RESPONSE 1-3 seasons
1. Farmers want new varieties of legumes but have limited access to them (specify crops)		• seed loans to well-organized groups- (groups review quality and quantity of seed returned--controls) • Pilot small pack sale of legumes o open markets o general rural shops within villages (with chief) • Women's marketing groups need to be formed around seed (see also agro-enterprise section) • **(Could supermarkets be explored as a venue for selling legumes for cash?)**
2. Farmers do not know about many of the new legumes varieties		• Launch information campaign on new varieties o In local dialect o On rural radios o through nkwaso (newpaper) o magazine- MoA -zachikumbe • ADMARC staff should be better trained to pass information on varieties + other agro-inputs • Work with local market traders ….to pass information on new varieties (WALA/govt agricultural staff)
3. Farmers seem not to know very much about OPVs (and how they differ from hybrids)		• conduct community-based demonstrations on OPVs • more posters on OPVs (as Demeter is doing)
4. Availability of new legume varieties/seed is a problem , esp soyabeans , PP, beans, cowpeas	Advocacy action by NGOs to request that more priority be given to legume foundation seed	• recom: increase base of foundation seed (how is this really going to be solved?) • seed bulking + multiplication enterprises- but always linked with clear business and marketing plan. (esp PP, gnuts, soyabean, cowpea) • Encourage WALA agro-enterprise groups to focus on legume seed • Better links (real links) between the foundation seed orgs and potential, efficient, multipliers

5. CMD /CMV is significant problem	Ag TQC Provide advice to NGOs/PVOs on how to buy /procure clean planting material. More sensitization with farmers on keeping planting material clean	WALA/Govt/Extension-scale up testing of CMV resistant materials(acceptable to farmers)
6. Scarcity of cassava planting material multipliers		WALA should link farmer groups to research to get new planting materials and set up ongoing organizational capacity to multiply (rapid seed multiplication techniques)
7. Farmers are increasingly geared towards market ,but • agro-processing possibilities are limited • also markets are far		Link to WALA Agro-enterprise activities (chilies? cassava products?—flour /starch) (Explore collective marketing)
8. Market seed is important, but there are concerns on • lack of new varieties		Link traders to sources of new varieties • To specific seed bulking/agro-enterprise groups • Prepare sheets on variety information- geared to traders… (sources of seed, attributes) • WALA might have organized meetings with local seed/grain traders (several times/yr)
9. Some Agrodealers (ADMARC) lack technical information on products sold		Prepare basic fact sheet on legumes for agro-dealers (parallel to that for traders).
10. Labeling of fertilizer products not clear		(note this is a problem only for the smallest sizes-- 1 kg bag)
11. Agro-dealer network are not sufficiently dispersed to serve rural community		WALA to campaign for new agro-dealer placement in select areas.

Seed System Security Assessment (SSSA) Action Plan Balaka -2011:

PROBLEM	SHORT TERM RESPONSE	MEDIUM to LONGER –TERM RESPONSE 1-3 seasons
12. Farmers want new varieties of legumes but have limited access to them (C/Peas+soya bean less known), Access to PP +GN new varieties is limited)		• seed loans to well-organized groups- FFS • Pilot small pack sale of legumes o open markets o agro-dealers o general rural shops o farmer marketing groups • Launch information campaign on new varieties o In local dialect o On rural radios
13. Availability of new legume varieties is a problem , esp pigeon pea	Advocacy action by NGOs to request that more priority be given to legume foundation seed	• recom: increase base of foundation seed (how is this really going to be solved?) • seed bulking + multiplication enterprises- but always linked with clear business and marketing plan. (esp PP, gnuts, soyabean) • Encourage WALA agro-enterprise groups to focus on legume seed • Better links (real links) between the foundation seed orgs and potential, efficient, multipliers
14. Adaptation information on new varieties in southern region not honed (??)		Community trials with farmers of new legumes varieties in WALA –(Participatory Variety Selection)
15. Cassava resistant to CMD not available	Ag TQC Provide advice to NGOs/PVOs on how to buy /procure clean planting material. More sensitization with farmers on keeping planting material clean	WALA/Govt/Extension-should test CMV resistant materials(acceptable to farmers)

16. Problems with cassava production and goats		Work with communities on live fencing options Facilitate By-laws within communities on goat management
17. Post harvest losses are high .Storage losses ongoing for all crops) (40 % for whole Malawi to be verified)	Sensitize farmers on degree of economic loss due to storage pests (do specific analysis)	Test triple bagging technique Test Hermetic storage (grain pro, super bag) Promote use of locally made pesticides such as Tefrosia, neem, moringa, millet+sand (note that WALA is currently involved in formal testing of the efficacy of the technology) (next August- schedule meeting to share experiences)
18. Farmers engage in distress selling on regular basis (sell at harvest, buy at planting)	Continue Village Savings + Loans programs	(explore options for farmers to group during stress periods for collective selling and better prices) Scale up VSL
19. Farmers are increasingly geared towards market ,but • Some markets far • Some markets are poorly developed (chillies, PP, groundnuts		Link to WALA Agro-enterprise activities (Explore collective marketing)
20. Market seed is important, but there are concerns on • Variety quality (mixing) and lack of new varieties		Link traders to sources of new varieties • To specific seed bulking/agro-enterprise groups • Prepare sheets on variety information- geared to traders… (sources of seed, attributes)
21. Farmers lack access to many innovations, more generally		DiNER SVF: Diversity and Nutritionfor Environmental Resilience. (DiNER)-Seed Voucher and Fairs (Bring in also elite farmers to become more involved in nutrition and diversity issues)
22. Agrodealers lack technical information on products sold		Prepare basic fact sheet on legumes for agro-dealers (parallel to that for traders)
12. Counterfeit seed sold in packets	Encourage farmers to keep receipts so as to allow for tracing—and recourse (if needed)	(government policy on traceability could be made more well-known--- as in tobacco model))

Seed Systems Security Assessment Action Plan for Chikwawa

Problem	Short term	Medium –Long Term
1. Lack of **access/money** to buy good seed	Promotion of VSL	-Up scaling VSL -Link farmers to markets (Agro-Enterprise/ FaaB) more effectively to increase income
2. Drought (low yields, hunger for both food and seed security)	-Encourage drought tolerant varieties for major food and cash crops -Diversification of production systems enterprises to increase resilience to drought .	-Expand Irrigation and rain water harvesting -Conservation farming -Drought tolerant crops &varieties -Diversifying farming system
3. Access to improved varieties for important crops (food & income) beyond maize this includes choice of variety for cotton.	-Increase production and productivity of general crops	-Up scaling basic cotton seed multiplication (Makoka 2000 -Cotton-Set a seed production and diversification system -Decentralized farmer based production system for legume seed (especially cowpeas, pigeon peas, Bambara nuts & groundnuts) with good marketing strategies –FaaB -Mounting variety demonstration and Participatory Variety Selection (PVS) -Field days for variety and production systems e.g. CA using lead farmers.
4. High cost of certified seed	-Promotion of Village Savings and Loans	-Promotion of Agro Enterprise and irrigation which is linked with increased productivity and income -Up scaling Village savings and Loan
5. Lack of appropriate technology for production Conservation Agriculture, Manure, seed multiplication ,production systems diversification + improved varieties linked to incentive for increased production	-Mount demonstrations on all production systems technology options	-Up scaling demonstrations ➢ -Train lead farmers, agro-dealers and seed producer groups; 5 skills set (**Group Management; Savings and Finance, Basic Marketing; Technology & Innovation; Basic NR Mgt)** for lead farmer and seed producers.

6. No legume seed at home	-Train farmers to increase legume production and improve storage systems -Expand decentralized legume seed production	-Expand decentralized legume seed production
7. Lack of rice & vegetable seed and use of recycled 'seed'	-Expand decentralized rice and vegetable seed production	-Expand decentralized rice and vegetable seed production
8. Seed of some important food crops not available in the local market-see market survey		-More training in FaaB/Business and marketing skills and VS&L (cost of seed should not be a limiting factor for irrigated vegetable production.
9. Lack of knowledge of agricultural products by agro dealers	- Train agro dealers on agricultural products especially differences in varieties, chemical use and dose formulation	-Develop fact sheets for agro-dealers on various agro inputs -More trainings for agro dealers
10. Under utilization of skills and potential for seed multiplication	-Intensifying the use of the Up scaling Project on seed multiplication in Chikhwawa	-Support Kasinthula Research station to do seed multiplication for general crops(all legumes, local vegetables, rice ,cotton-{Makoka Research}) and link to decentralized seed system required by farmers -Up scaling seed multiplication by research{Up scaling Project} and farmer seed multiplication groups with irrigation to be based on market for seed of specific crops / varieties tied to well defined marketing strategies.