

Seed Security Assessment A Practitioner's Guide



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Abbreviations and Acronyms

AAP	Accountability to Affected Populations
ACF	Action Contre la Faim
AVSI	Associazione Volontari per il Servizio Internazionale
CBO	Community-based organization
CIAT	Centro de Investigación de Agricultura Tropical
CESVI	Centro Studi per lo Sviluppo e la Cooperazione
CMD	Cassava Mosaic Disease
CRS	Catholic Relief Services
DK	Don't Know
DSD	Direct Seed Distribution
DWR	Don't Want to Respond
ECHO	European Commission Humanitarian Aid
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus Group Discussion
FFS	Farmer Field School
FSS	Formal sector seed
Ha	Hectare
Kg	Kilogram
HH	Household
IDP	Internally Displaced People
l	Liter
LMS	Local Market Survey
LoMS	Local Market Seed
MoALF	Ministry of Agriculture, livestock and Fisheries
NA	Not Applicable
NR	No Response
MS	Microsoft
NGO	Non Governmental Organization
OECD	Organisation for Economical of Co-operation and Development
OPV	Open-pollinated variety
OSS	Own saved seed
PGRFA	Plant Genetic Resources for Food and Agriculture
REOA	FAO Sub-regional Emergency Office for East and Central Africa
SI	Standard Unit
SSA	Seed Security Assessment
SSSA	Seed System Security Assessment
SSCF	Seed Security Conceptual Framework
Std. Dev.	Standard Deviation
ToR	Terms of reference
ToT	Training of trainers

UN

United Nations

URCS

Uganda Red Cross Society

WFP

World Food Program of the United Nations

PREFACE

Sufficient access to healthy and preferred seed for different crops is of fundamental importance for millions of households in the developing world. If good quality seed is scarce, then rural farming families struggle to make a sustainable livelihood, and family members are forced into coping strategies in order to meet food and income needs. These strategies may deplete assets, further reducing the ability of the family to meet its needs. Achieving and maintaining seed security is therefore an important goal.

Seed security exists when men and women within the household have sufficient access to quantities of available good quality seed and planting materials of preferred crop varieties at all times in both good and bad cropping seasons. Measuring seed security is important in crisis and non – crisis situations as seed insecurity is not confined to post – disaster settings, although it may be at its most acute at these times. Another important context for measuring seed security is in a protracted crisis, where the problem may be more chronic in nature. In such cases, the underlying fragile seed situation can be punctuated by acute episodes due (e.g.) to an upsurge in fighting in a particular area which can disturb local markets. Finally, seed insecurity may be chronic in nature in a non – crisis context, in situations of deep poverty and social exclusion such as that which exists for large numbers of households in peaceful parts of Africa.

Seed – related interventions are commonly based on the assumption that food security problems directly imply seed security problems. However, this may or may not be the case. Further, when problems do occur these are not necessarily related to the physical availability (supply) of seed. One of the most common problem is lack of resources to obtain seed. This can occur even when seed is available on the market. In such cases a more appropriate response to seed insecurity might be a scheme which increases household purchasing power for seed whilst not increasing the supply. This can be achieved quickly through a seed voucher scheme. Longer term solutions would involve actions which reduce poverty, thus increasing purchasing power.

In order to decide on the most appropriate short and longer term seed related intervention, it is necessary to understand seed security by undertaking an assessment prior to intervening. The seed system security assessment (SSSA) methodology, developed by CIAT and CRS (Sperling, 2008), and formalized in the publication “When Disaster strikes. A guide to assessing Seed System Security (Sperling, 2008) attempts to do this. This tool has been used in many countries during the past 10 years including Mali, Zimbabwe, Ethiopia, Sudan (Darfur region), South Sudan, Haiti, Malawi, Kenya, DRC and Côte d’Ivoire. Over the past 4 years, the tool has been extensively used and further refined by users. Despite this, understanding of seed security and seed security assessment is still restricted to a very small group of specialists. Worryingly, a recent study undertaken in the Horn of Africa and the Sahel found that less than 10 percent of post-disaster seed related interventions were based on Seed Security Assessments. This is due to a number of reasons including: lack of technical capacity to undertake assessments; poorly articulated assessment recommendations and low level of awareness of assessment findings by decision makers. This is a serious situation, as undertaking seed related interventions without a proper understanding of seed security can do more harm than good.

With the benefit of funding from ECHO, over the past 18 months FAO has supported a number of activities which seek to address this situation. Actions have included: development of revised and expanded Seed Security Assessment training materials; conducting national level training SSA workshops in 4 countries in the Horn of Africa (Ethiopia, Kenya, Somalia, South Sudan) and the Sahel (Burkina Faso, Chad, Mali and Niger) initiating Communities of Practice for SSA in the Horn and Sahel; conducting regional level Training of Trainers (ToT) courses and undertaking seed security assessments. This SSA practitioner’s guide has been developed as part of this process.

This Practitioner's Guide has been developed by a team consisting of the following persons (in alphabetical order): Neil Marsland (FAO), Matthias Mollet (Consultant), Joseph Okidi, (FAO) Lucio Olivero (FAO), Thomas Osborn (former Senior Seed Officer, FAO) and Roger Shongo (FAO). Significant contributions have also been received from David Hampson (former FAO consultant), Samuel Kugbei (FAO Seed Security Officer), Phillipe Le Coent (formerly FAO), Thomas Remington (formerly CRS) and Stephen Walsh (formerly CRS). This Guide has been enhanced by the feedback of more than 80 SSA trainees from Burkina Faso, Chad, Ethiopia, Kenya, Mali, Niger, Somalia and South Sudan who attended the SSA workshops.

The Practitioner's Guide has been produced to provide practical guidance on the theory, technical knowledge, procedures and good practices necessary to implement an SSA. This publication will provide an important reference and refresher for SSA practitioners and those seeking practical information on SSA. This is version 1 and we hope that it will be improved after a period of usage and feedback.

1 Introduction



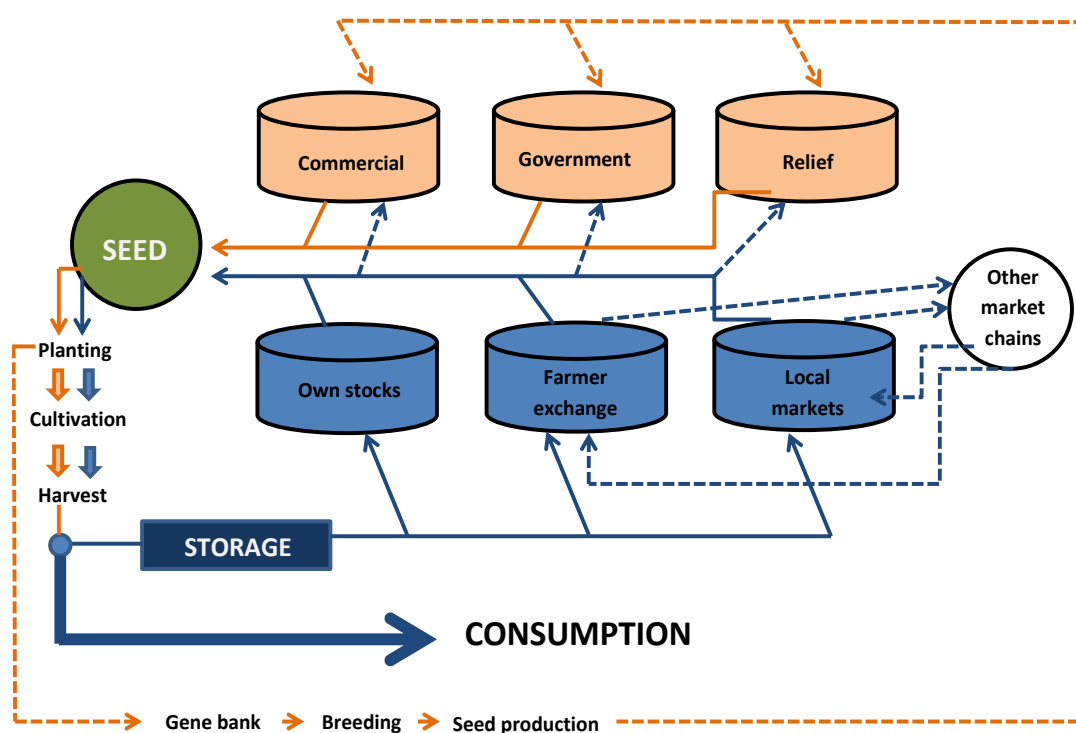
1 INTRODUCTION

1.1 Background – What is a seed system?

The seed system refers to the various ways in which smallholder farmers obtain seed. Seed sources can be grouped into “informal” and “formal” sector sources. In terms of proportion of seeds used by small farmers, the informal sector is by far the most important, accounting for around 80 – 90% of the total stock of seed in the developing world. The formal sector provides farmers with improved/modern varieties which are the result of a series of activities, starting with plant breeding and ending with commercial seed on the market through seed companies, input dealers, government channels and international aid agencies. The informal sector consists of all the other ways in which farmers obtain seed namely: from their own harvest; from friends, relatives and neighbors either through barter, gift or sale and through local informal markets. The informal and formal sources are part of one overall system, the various parts of which interact with each other to determine the relative importance of different seed channels to a particular farmer. For any given farmer, seed sources may vary according to crop type, and it is not unusual for farmers to meet seed requirements for one crop from a range of sources. In situations of stress, it is often important for farmers to have the opportunity to switch between sources, so that if one source dries up, another source can be tapped to compensate.

Figure 1 below represents a typical seed system for a hypothetical small farmer in Africa, Asia or Latin America. Here the interactions between different parts of the overall system and within the different formal and informal sub-systems are clear. For certain crops at certain times only one or two of these channels might be in operation for a particular farmer. For example, for Vegetatively Propagated Crops (VPCs) e.g. cassava, sweet potato and yam, local markets are generally not used as a source, whereas for field crops such as beans and maize, local markets are often very important sources.

Figure 1: Smallholder farmer seed system



Source: adapted from Sperling (2008)

1.2 Overview of Seed security

Building on a 2008 FAO definition, “household seed security can be said to exist when the household has sufficient access to adequate quantities of good quality seed and planting materials of preferred crop varieties at all times following both good and bad cropping seasons”. This definition can be extended to the intra household level by substitution “household” with “men and women” as follows:

Seed security exists when men and women within the household have sufficient access to quantities of available good quality seed and planting materials of preferred crop varieties at all times in both good and bad cropping seasons.

Seed security can be understood of as consisting of four distinct elements.

1. Seed Availability: seed supply.
2. Seed Access: means to obtain through cash, loan, barter, or gift.
3. Varietal Suitability: extent to which crop varieties are preferred and adapted to farmer conditions.
4. Seed Quality: physical, physiological attributes and seed health.

A particular individual, household or community can be said to be resilient in seed security terms if after a particular shock, series of shocks and /or longer term stresses, it is able to maintain or increase its level of seed security as defined by the four elements. In this sense, “resilience” is a quality which cuts across the four elements.

Seed insecurity exists when any of these aspects are not present. Knowing which particular aspect(s) of seed insecurity is / are present is critical for designing appropriate interventions.

1.2.1 Seed availability

Seed availability refers to the physical quantity of seed available from all sources. Under this definition, adequate availability of seed exists when there is sufficient seed from own saved seed, social networks, in local markets and the formal seed sector to meet seed needs of local households. The available seed should be in reasonable proximity to the farmer and be available in time for planting.

Box 1: Examples of seed availability issues

- a) There is a complex emergency of civil conflict over a wide area and drought that has disrupted usual farm-saved seed supply and operation of local markets so that seed is not available within a reasonable distance. This could be a problem of seed availability for crops with a high seed rate such as direct seeded rice and groundnut.
- b) A household has limited own-saved seed for planting due to a flood and social network sources have dried up, however there is enough seed of preferred varieties and crops available in the local markets. There is not a problem of seed availability.

Indicators for seed availability at household level would include:

- a) Quantity of own saved seed stored at the household
- b) Quantity of seed known to exist within social networks
- c) Quantity of grain of preferred varieties and crops available in local markets at planting time which farmers could use as seed
- d) Quantity of seed available with seed companies and local seed stockists at planting time
- e) Quantity of seed available through seed aid organisations at planting time (should be applicable only when there is an identified seed access problem)
- f) High prices of seed in local markets, seed companies and local seed stockists
- g) Proximity of seed sources in relation to the household – e.g. distance to local markets, local seed stockists
- h) Time in which seed is available (before, at the start, mid or late season)

1.2.2 *Seed access*

Access to seed is defined as the ability and willingness to acquire seed through cash purchase, exchange, loan, barter or use of power in social networks. In relation to the latter, whilst seed may be available within a social network (see above), it may not be accessed due to lack of power, status or influence of the household to acquire it. Seed may also be obtained through barter – i.e. in exchange for another commodity or service such labour, and it may be given on loan, on the condition that an equal or greater quantity is returned at a later date. Finally, seed may be acquired in exchange for cash, in local markets or in seed distributors (formal sector).

Box 2: Examples of seed access issues

- a) The household does not have sufficient own-saved seed but the farmer is able to obtain a gift of seed from their social networks which indicates seed access is not a problem (i.e. lack of physical availability has been compensated for by social access).
- b) The household and its social networks do not have sufficient seed for planting and they must acquire seed from local markets but they have limited economic resources to barter or purchase seed due to the economic effects of the disaster and the market seed sellers refuse to give seed loans. This situation would indicate seed insecurity due to problems of lack of physical availability at household level plus social and economic access.
- c) A severe drought during the previous season has drastically reduced own saved seed and social network seed and the economic assets of vulnerable households. However there is seed available in the local market but at a higher price than normal. Due to the loss of income from the poor harvest, farmers lack the cash to purchase seed. This is an access problem, made worse by an availability problem which causes the higher prices.
- d) A flood has affected the crop in the field in a small area and reduced the food security and economic assets of poor households. These households need vegetable seed to plant during the dry season for food and income but they do not have the money to buy the seed. This also is an access problem.
- e) Drought then civil strife has radically reduced rice production and made the availability of rice and rice prices rise greatly. Some farmers report good rice harvest but most of the smaller farmers in these same communities report poor harvest and they predict a challenge to acquire rice seed for the next season. These smaller farmers will be forced to depend on the market and would therefore face an access problem with prevailing prices. However, farmers with good harvest are willing to provide seed as a low cost loan. This would not be an access problem.

Indicators for seed access at household level would include:

- a) amount of seed accessible by the household through social networks (social access);
- b) level of household income obtained through different sources;
- c) wealth of household as defined by fungible assets (e.g. livestock);
- d) purchasing power of households (disposable income relative to price of seed in local markets).

1.2.3 Varietal preferences / suitability

This aspect of seed security refers to the ability of farmers to have seed of crop varieties which have the characteristics that they prefer. There are a range of desirable characteristics which may differ from household to household, or between men and women within the household. The most commonly cited desirable characteristics include: appearance, taste, aroma, cooking quality, storability, ability to produce fodder, high income potential, high production potential, disease and pest resistance in the field, and quality for making certain derivatives such as beer.

Households require seed of crop varieties that they know, have a preference for and are confident to plant. In some cases farmers can identify the seed of the varieties they use. This is also why farmers

need to trust the seed seller or giver since varieties cannot always be identified by looking at the seed. Also farmers are sometimes hesitant to plant seed from an unknown origin since it is a big risk if the variety is wrong or the seed quality is poor. The situation is complicated by the fact that in some cases the varieties that farmers know may not be adapted to the current situation due to drought, pests or diseases and there is a need for farmers to be introduced to new varieties. Understanding this in a field situation can be challenging and requires a good knowledge of the context and the varieties being used.

Box 3: Examples of varietal suitability issues

- a) Several communities report that their current millet varieties take too long to mature and with the apparent shortening of the rainy season, they want and need shorter duration varieties. The short term varieties of millet which they had previously grown and appreciated are in short supply - they cannot plant them in the same quantity as in the past and as per their desire.
- b) Improved varieties of sorghum have been distributed following a drought. Whilst high yielding, the variety does not produce good fodder, and is therefore not liked by the targeted agro-pastoral populations.
- c) New improved varieties of cassava have high tuber yield when compared with existing local varieties but the tubers of the improved varieties do not cook well while the leaves and the leaves are unsuitable for human consumption.

Indicators for varietal suitability / preference would include:

- a) level of farmer satisfaction with the crop and varieties they are currently growing or desire to grow;
- b) specifically desired characteristics which are/ are not present in the varieties which they are currently growing;
- c) number and types of problems related to current varieties (duration, pest, disease, yield);
- d) farmer access to true and useful information about varietal suitability;
- e) substitution or replacement rate of varieties.

1.2.4 Seed quality

Seed quality includes a number of seed attributes such as germination, physical purity, moisture content, seed health, and – for some crops – varietal purity. Though it is a quantitative parameter the perception of the farmer depends on the crop and what they consider normal or acceptable. Some of these seed attributes are apparent when you examine the seed and others are not. Seed quality attributes are an essential parameter of seed security because of their potentially positive or negative impact on the farmer's ability to successfully establish a crop in the field and to have a reasonable yield.

The key attributes of seed quality can be listed as follows.

- **Germination:** germination is the ability of the seed to produce a normal seedling under favourable conditions. The germination rate of seed cannot be determined by looking at the seed but requires a germination test or waiting until the seed is planted. Germination is adversely affected by seed stored under high temperature and relative humidity that result in

the rapid deterioration of legumes and vegetable seed but normally cereal crops such as rice, wheat, millet, sorghum and maize are less effected. Maintaining low seed moisture content is essential for maintaining high seed germination.

- **Physical purity:** it is easy for farmers to see if the seed is clean, free from inert material (chaff, stones, broken seed, and dirt) damaged by insect attack and free from dead or live insects. Seed should be relatively uniform and not contain immature grains. Farmers sometimes clean seed before planting depending on the planting method. Seed can also be attacked by insects during storage creating damaged seed that may not germinate and grow.
- **Seed Health:** seed can carry diseases or insects that will later attack the plant or be transmitted to other plants. Therefore it is important that seed is free of pests and diseases. Seed health may not be determined by looking at the seed and requires seed health testing or growing the seed to the seedling stage. Seed may be damaged during storage meaning it can be more easily attacked by diseases. Monitoring of seed fields to identify and address disease problems is the main way to address seed health but seed treatment is also used.
- **Varietal purity:** varietal purity means the seed is of one variety and not a mixture of varieties or seed of various crops. For some crops such as rice this is important (due to difficulty of harvesting because of different heights and growing periods), whereas it is less important for other crops such as beans, where mixtures of varieties are sometime grown and selection of seed can be done before planting.
- **Moisture content:** moisture content is the amount of water contained in the seed sample and is expressed as a percentage of the weight of the original sample. It is one of the most important factors in maintaining seed quality and is closely related to other aspects of physiological seed quality such as seed maturity, mechanical damage, seed drying, storage life of the seed, and susceptibility to insect or disease infestation. Moisture content can be determined by electronic moisture meters or by oven drying method in the laboratory.

Box 4: examples of seed quality issues

- a) Farmers in many communities indicated that insect infestation during storage for cowpea has been a constant challenge - in some cases cutting the stored quantities by 50% and reducing the germination and vigor of cowpea seed planted - and this has prevented these farmers from investing more into cowpea which has a great market potential. This is a seed quality problem (germination).
- b) The traditional millet variety in the area has a great diversity in size of head of grain even after the plants are thinned. Better selection of plants at harvest over time can increase the varietal purity and potentially higher yields. In addition the seed can be cleaned before planting to eliminate small, damaged and immature seed and this improved the overall physical purity of the seed that may increase germination and vigor of the seed. In this way, potential seed quality problems (varietal and physical purity) can be reduced.
- c) Small farmer potato production is affected by disease problems. By using disease free seed potatoes, better storage of seed potatoes and field sanitation, potato yields can be dramatically increased. Thus the seed quality problem (disease) is effectively addressed.
- d) Farmers have started to use a new system of hermetic seed storage for groundnut seed to reduce the problems of insect infestation during storage. However when the seed are planted, germination is low due to high moisture content and rapid deterioration during storage. This would be a seed quality problem that can be solved by better drying before storage.

Indicators for seed quality would include:

- a) proportion of diseased seeds from different seed channels (on-farm; local market; social network);
- b) rate of germination of seeds from different seed channels: provided by farmers; local market; social network;
- c) mean % physical purity of seeds from different seed channels: provided by farmers; local market; social network;
- d) mean % varietal purity (when a pure variety has specific advantages) of seeds from different seed channels: provided by farmers; local market; social network.

1.2.5 Resilience

In seed security terms, a farmer is resilient if he / she can resist the impact of a major shock or stress so that pre-existent levels of seed security are either maintained or quickly returned to. The degree of resilience is measured by the extent to which seed security is adversely affected by a particular shock or series of shocks. When faced with the same shock (such as drought) two farmers in the same village may exhibit different degrees of resilience to the shock in terms of their seed security. Thus one farmer may become seed insecure as a result of the drought (not resilient), whilst another remains seed secure (resilient). Some households may be susceptible to very small shocks, in which case we can say that they are highly prone to seed insecurity (very low resilience).

Indicators

Resilience is manifested in the degree of seed security in terms of seed availability, seed access, seed quality and varietal suitability after a shock. Thus it can only be directly measured by changes in indicators for these aspects (see earlier sections). These changes can then be compared across different households to ascertain degrees of resilience to that shock. Further investigation will reveal reasons for different degrees of resilience. It is likely that the reasons will include:

- Livelihood diversity (risk spreading)
- Crop and varietal diversity (risk spreading)
- Different abilities to switch between seed source channels – linked to:
- Amounts of stored seed, degree of social access, proximity to local seed markets (local grain dealers and agro-input dealers)
- Different levels of asset ownership and ability to liquidate assets
- Different access to information about climate, seed sources, prices
- Different policy environments (e.g. whether the informal sector is recognized as a bona fide source of seed or not in the existing policy frameworks)

2 Conducting a Seed Security Assessment



2 CONDUCTING A SEED SECURITY ASSESSMENT

2.1 Principles of Seed Security Assessment

Seed Security Assessment (SSA) entails collecting and analyzing data to allow an understanding of the parameters of seed security, as well as how best to intervene to support seed security. Whilst SSA is characteristically carried out in an emergency context shortly after a shock; it can also be executed in the context of a protracted crisis or as a baseline exercise, when there is no crisis. Whenever SSA is carried out, certain principles should always be upheld. The key principles of SSA are as follows.

Rigor: SSA should be based on a well defined sampling strategy and results should be analyzed rigorously, using standard quantitative techniques.

Triangulation: SSA consists of collecting and analyzing information from a number of sources and angles. The standard tools of SSA include:

- Household Survey (HHS) questionnaire
- Local Market Survey (LMS) Questionnaire
- Focus Group Discussion (FGD) Guide
- Key Informant Interview (KII) Guide
- Agro-Input Dealers Questionnaire
- Seed Growers Farmers / Groups Guide
- Seed Aid Actors Guide

Information gained from these tools must be triangulated – i.e. compared and contrasted, to confirm or dispel emerging indications about the nature of seed (in)security.

Participation: collecting information from various sources does not necessarily guarantee adequate participation in the SSA. The main objectives of participation are to increase ownership of the process and, through this improve the quality and the accuracy of the process and results. This is achieved in various ways including: ensuring that all parts of the community are involved in the assessment – including women, youth and marginalized; being transparent with those being interviewed about objectives and uses of the information being collected; involving staff from organizations supporting seed activity in the target area – particularly the Ministry of Agriculture.

Feedback of results: a key aspect of SSA is that strenuous efforts should always be made to provide a feedback of the results to households and communities which have been interviewed or to their representatives. This is part of being accountable to the populations served by SSA, and it may be accomplished in various ways depending on circumstances. It is recommended that wherever possible, before leaving a particular survey area (e.g. a district), the SSA field team gives a preliminary feedback of findings to people living in the district. This could be one of the communities visited during fieldwork and / or a gathering of local leaders. As well as informing the ultimate clients of the SSA, this process presents an opportunity to discuss and verify initial findings and follow up on questions.

Practical recommendations linked to elements of seed security: a key principle of SSA is that recommendations should be practical and actionable. Proposed responses should be clearly linked to one or more of the elements of seed security (access, availability, varietal suitability and quality) and be divided into short and long term responses¹.

¹ Further details are given in Section 3.

Links to decision-making: SSA analysis and recommendations should be presented in the right way at the right time to the right decision makers. This means that dissemination of SSA results should not consist only of the presentation of the final report to Ministry of Agriculture staff or members of the Food Security Cluster. As much as possible, recommendations should be targeted to specific decision-makers and institutions, and opportunities should be sought to present key findings in appropriate formats and in relevant decision making processes.

2.2 Preparation for Seed Security Assessment

Preparation for an SSA requires defining scope and objectives; identifying stakeholders; developing SSA terms of reference (ToR); logistical preparation and budgeting, and; training of assessment teams.

2.2.1 Defining scope and objectives

The overriding goal of the any SSA is to understand the seed security situation of the target or affected communities based on the elements of the seed security conceptual framework (SSCF): availability, access, varietal suitability and quality. The way in which this is done will vary according to the situation. In this regard, it is useful to think in terms of three broad kinds of situation:

(a) Post-disaster / emergency: here the current seed security situation may be compared with the situation before the disaster. This therefore requires understanding of the farming/seed system (baseline) before the occurrence of disaster as well as the current situation.

(b) Non-emergency: in this case, the SSA takes the form of a situation analysis: i.e. it focuses on current seed security without comparing to the past.

(c) Protracted crisis: in a protracted crisis, seed security may fluctuate according to periodic worsening or improvements in the situation. When there is a sudden change in seed security within the overall context of a protracted crisis, then it may be possible to apply the before and after technique used for a classic post-disaster situation to look at the impact of that particular shock within the broader crisis context. In the absence of this, it can be difficult to establish a baseline against which the current situation can be compared, especially if the crisis has been ongoing for several years. One technique which can be used is to compare the current situation to a previous time which was considered “normal” or “pre-crisis”. If the crisis is limited in geographical scope, another technique is to compare the situation with areas and households which have not been affected.

A further factor having a bearing on the orientation of the SSA is the kind of cropping system which exists in the geographical area of assessment.

Seed and seed security have to be examined in the context of the cropping system used in the area of interest. The primary cropping system is the field crops which for most practical purposes are cereals and grain legumes. However in some agricultural systems vegetative propagated crops (cassava, sweet potatoes, potatoes, bananas, etc.) are important and in others vegetable production is an important component of food security. The relative importance of these different cropping systems should emerge while gathering background information for conducting an SSA. In addition during household survey, focus group survey and visiting local markets, the significance of these three cropping systems should become clearer as food crops and cash crops.

- Cereal and Legume Cropping Systems: this is the dominant cropping system in most countries and consists of cereal crops such as maize, rice, sorghum, millet, wheat and legume crops such as groundnut, cowpeas, beans, etc. These crops are produced as mono crops or intercropped. The production is for home consumption but also for the local market.

- Vegetable Cropping Systems: both local and exotic vegetable crops are normally intensive small scale cropping systems of high value vegetable for the local market but also for home consumption. Vegetables are sometime produced during the dry season with irrigation. Vegetable plots are often planted as home gardens in addition to cereal and legume in larger plots.
- Vegetatively Propagated Crops: in some parts of the developing world cassava, bananas, yams, sweet potatoes, irish potatoes, etc. are critically important crops for food security. Pests and diseases that are on or in the living tissue of vegetative planting materials can be transmitted which can potentially infect not only the other plants in the field, but also other species. For this reason, a SSA specifically focused on vegetatively propagated crops is under development. These crops are often produced along with cereal and legume crops and/or vegetables crops.

Current SSA methodology is oriented towards the cereal and legume cropping system. This is not suitable in all cases, and therefore the methodology should be adapted accordingly. ²

2.2.2 Identification of stakeholders

Within the target location or geographic scope, there could be many public/private organizations and institutions doing seed related activities or with interest in supporting seed security. These could be relevant government ministries, government research agencies, international and national non-governmental organizations, community-based organizations (CBOs), private sector seed companies, etc. Involvement of the different stakeholders requires a consultative process to sensitize on the need to conduct SSA, and discuss scope and objectives. This can be done through bilateral discussions with agencies operating within the target areas and/or through a stakeholder scoping workshop. This involves inviting the potential stakeholders for presentation of the proposed SSA and open discussion on the scope and objectives.

Stakeholders can be categorized into direct and indirect. *Direct* stakeholders are those interested in supporting the assessment financially, logistically and technically (with human resources) while *indirect* stakeholders are those interested in the outcome the assessments and those are most likely to use the SSA results.

2.2.3 SSA Terms of Reference

Once the scope and objectives have been defined and stakeholders identified, terms of reference (ToR) should be developed by the lead organization or technical personnel from within a consortium of interested organizations. The ToR for the SSA gives a brief background and justification for the assessment; defines the overall and specific objectives; the scope and assessment sites; the time frame; assigns roles and responsibilities, as well as provides a tentative budget. This ToR could then be shared with the direct stakeholders as a road map for conducting the SSA.

2.2.4 SSA training

SSA training can be done at two levels.

- a) *Intensive SSA training*: where capacity and skills in conducting an SSA is limited, an intensive 5-day training should be conducted by experienced facilitators (it is advisable to have at least

² It is important to note that currently there is no formal set of tools for analyzing SSA in Vegetatively Propagated cropping systems or Vegetable cropping systems. Such guidance is currently under development.

two facilitators if possible for this training). This training takes the participants through nine modules as follows: Seed System: basic concepts; the Seed Security Conceptual Framework; seed interventions in the recent past; the five steps of conducting an SSA; standard SSA tools; site selection and sampling; field work preparation and execution; generation of results, data management, analysis and reporting (further details in the SSA training and facilitator guides).

- b) *Refresher SSA training*: this is done with already trained staff, and takes place just before an assessment. This training needs a minimum of three days – day one to cover theoretical aspects; one day on adaptation and pre-testing of the SSA tools and one day on planning. In this training, a sub-set of the standard nine SSA modules are used. Generally speaking the following is covered: the SSA SSCF; the five steps of conducting an SSA; adapting standard SSA tools to local context and survey objectives; site selection and sampling; fieldwork preparation.

During the two trainings it is important to establish the conversion factors table to convert local units into international standard (SI) units for measurement, with the support of the trainees who are familiar with the local units of measurement for area, weight and volume. These units can later be validated during actual field work by the various teams as there could be slight variation from one location to another. The common SI units for area, weight and volume are acre (or ha), kilogram (kg) and liters (l), respectively.

2.2.5 *Logistics and budget*

Key to a successful SSA is a realistic budget and careful logistical planning. Logistical requirements include transport (vehicles, motorcycle, bicycles) for the SSA teams to reach the intended SSA sites; stationary materials and data collection aids (questionnaires forms, guide questions, pens, pencils, pocket calculators, clipboards large size envelopes etc.); protective gear (gumboots, raincoats, umbrella, mosquito repellents and nets) where necessary, and accommodation costs in the field. An example budget can be found in Annex 11.

2.2.6 *Secondary data*

The focus of secondary data is on understanding the broader context of the assessment. This includes previous SSA; food security studies; published statistics on crop types, hectares, yields; data on markets, seed traders, input and output prices; nature and extent of a particular emergency/disaster; activities and reports of seed related interventions in a particular area or time period. Such information can be gathered from agricultural surveys and censuses, price monitoring, assessment reports, project/program reports, newspaper reports bulletins, publications, newsletters, etc.

NOTE: some secondary data can be gathered in the field during the fieldwork itself.

2.3 Field work – Data collection

2.3.1 *Preparation for field work*

Before any team heads to the field, each member should understand clearly the objectives of the SSA, and those responsible for collecting information from various sources should be well versed with the assessment tools; their roles and responsibility during data collection; sampling procedures; and have the right skills for collecting information.

A detailed work plan is required for each team in order to reduce time and resource wastages during the assessment period. Some delays are unavoidable (e.g. funerals) others can be identified and mitigated. The following could lead to time wastage during data collection.

- a. *Limited contact with the potential key informants*: prior understanding of the most probable time the various respondents will be available is necessary to minimize time wastage.
- b. *Insecurity*: proper security (e.g. inter-tribal conflict) updates in areas prone to insecurity is required to minimize delays and plan accordingly.
- c. *Bad roads*: understanding of the road conditions to the various locations in advance helps mitigating delay. An experienced driver could be consulted on the time required to reach location A from B.
- d. *Busy market days in major trading centers*: in certain trading centers and towns, market days are sometimes celebrated once or twice a week. These days normally attract big number of rural famers into towns. Although it presents opportunity to interview non full time traders, it is normally more challenging to interview grain traders and agro-input dealers who tend to be more interested in serving their customers than providing information.

2.3.2 SSA team and roles of team members

Data collection should be done by trained SSA team members. Ideally, the SSA team would be comprised of people with different backgrounds such as seed experts, agronomists, plant protection officers, agricultural economists, socio-economists and data analysts. Wherever possible, the team should be composed of both men and women. Ideally, the entire assessment should be led by an expert familiar with every aspects of SSA. Where the assessment is to cover a wide geographic scope (regions, states or counties), it is advisable to form 2-4 sub-teams, with each sub-team having 5-6 members. The sub-team composition and roles could be defined as follows.

- *Team leader*: provides leadership to the team and ensures that the team is introduced to local authorities in the area visited. He/she provides additional support in collecting information from Key Informants (Government, NGOs officials, etc.) as well as local markets and agro-input dealers information. Other oversight roles of the team leader include:
 - Guiding the enumerators on the sampling procedure to follow.
 - Checking the quality of the data being collected by the enumerators at the end of every day. This will ensure that the enumerators are guided as early as possible as they progress with the assessment.
 - Regularly checking the data being entered by the data clerk. This should be done daily after field work so that any error or difficulties are identified and corrected.
 - Facilitating discussion of the results, observations and emerging issues, with other team members as well as on the assessment.
- *Focus Group Discussion (FGD) facilitators and recorder (2 persons)*: this requires experienced people, preferably those with good background in seed and crop production. Their major role is to conduct and synthesize FGD and action points. It is advisable for the facilitators also to participate as enumerators for the household questionnaire during the household data collection. Participation of the facilitators in household data collection helps the facilitator understand some critical issues at household level that can be brought for further discussion in a focus group. Normally, the FGD will take between one and two hours. For more details on facilitating FGD see facilitator's guide handouts in the SSA Manual for Trainees.

- *Household enumerators (2-3 persons)*: the household enumerators have the task of gathering the largest volume of information using a structured questionnaire. With the current tool, the Household Survey (HHS) questionnaire (Annex 7.3), each enumerator is able to conduct 4-7 interviews per day. It is important that the enumerator communicates with the respondent in a language well understood by the respondent, preferably the local language and without use of a translator.
- *Data clerk (1 person)*: to speed up the process of data handling, it is advisable that each team has one data clerk who will be solely responsible for entering data as they start coming in. Apart from entering the data, the data clerk can provide useful feedback to the team leader on the clarity of the information coming from the enumerators.

2.3.3 SSA site selection

The choice of the sites depends on the scope and objective of the assessment while factoring in availability of resources (financial, staff and time) to carry out the assessment as well as constraints such as accessibility and security issues. Some important considerations include:

- Agro-ecological zone. Ensure that the major agro-ecologies within the assessment catchment are well represented.
- Disaster affected and non-affected areas. For comparative purpose, in a disaster situation, it is useful if both the affected and non-affected agro-ecologies are studied (although this might not always be possible).
- Trade links and influences of border proximity. Good links to neighboring or external markets may have significant influence on household seed security.
- Socio-cultural zones and differences. Seed security can be affected by cultural practices which influence cultivation patterns and crop choice.

An example of site selection methodology used in East Africa is as follows:

- obtain the lists of all the districts (for Uganda, Tanzania, Somalia, and Ethiopia) or counties (for Kenya and South Sudan);
- sort out those that pose real security risk or are completely inaccessible (mostly due real security);
- purposively select the districts/counties to represent the various agro-ecologies of interest, and where the assessment is in relation to the disaster, the affected areas are well represented.

2.3.4 Sampling³

In SSA, households are selected using probability sampling, whereas all other sampling units (individuals for community FGD, traders, government officials, NGO representatives, seed producers) are not. In the case of these units, representativeness relies upon purposive sampling.

³ Much more detail on sampling can be found in Annex 3.

Sample sizes for all aspects of SSA will be a trade-off between the theoretical best practices and the available resources – human, financial, logistics and time. This trade-off will influence the final level of reliability at the selected site level. The final decision on the sample size during surveys preparatory phase often requires the responsible person to make a decision as he/she has to make a trade-off between those two components (optimal sample size and available resources).

In the case of the household questionnaire, once the overall sample size has been determined at one administrative level (e.g. regional/provincial level), this sample size can be divided proportionally to the populations of entities at the next administrative level down (e.g. counties or district). If geographical entities at the lower administrative level have similar population sizes, then the overall sample size can be divided equally among the selected entities. The different sizes of sample will have implications for the time required to cover each district.

Sampling of households within a village size is normally done by **systematic random sampling**, which in most cases is more efficient than simple **random sampling**.

2.3.5 Seed Security Assessment tools

A number of SSA tools have been developed. Annex 7 includes the different tools. These tools have been developed to facilitate effective and efficient field work, based on the elements of the SSCF. The standard SSA tools are as outlined below.

Key Informant Interview (KII) guides and questionnaires

Key Informant guides / questionnaires have been developed for the following stakeholders:

- government / NGO staff;
- formal seed sector operators (research, seed growers and agro-input dealers); and
- community based seed producers.

These instruments provide a context which helps in interpreting the findings of other SSA tools as well as in the identification of responses to support seed security. During field work, the KII should be conducted first with the government/NGOs staff. This helps the assessment team have some preliminary understanding of the farming and functioning of the seed system as well as on who is doing what where.

Household Survey (HHS) questionnaire

This collects primary data from sampled households. Key areas covered include: socio-economic parameters; current crops and seed system profile; major crops and seed sources; indicators of seed security; suitability of varieties; seed availability; seed access; seed quality. Mainly quantitative data with limited qualitative information are collected.

Local Market Survey (LMS) questionnaire

Local markets provide alternative sources of seed to farming communities across Africa. It is therefore imperative that the SSA includes a local market survey. The LMS gathers information on the various aspects of the Seed Security Conceptual Framework i.e.: varietal suitability (adaptability and farmers' preference), seed availability (timing, volumes and proximity), seed access (prices and quantities obtained by the farmers) and quality (physical) of the seed available in the local market. It also looks at some of the practices such as seed cleaning/sorting and greading, additional drying and treatment etc with the grain traders that helps avail and keeps seed of acceptable quality by the farmers.

Focus Group Discussion (FGD) guide

This guide is used at community level in the same villages as those in which the household questionnaire is being administered. The FGD is a participatory research tool in which a group of participants (6-12) jointly discuss and develop a common understanding of issues. It can be useful to

extract in-depth information on the concepts, perceptions and ideas of a particular group e.g. resource-poor, differently-abled, females, males, young people – or it can be used to gather views representative of a whole community in relation to the farming and seed systems. The FGD is a useful tool to understand how the farming and seed system works within the community and how the system evolve over time. For further details see the training guide on facilitating FGD.

2.3.6 Interviews⁴

Irrespective of the tools to be used, the SSA practitioner should be able to clearly introduce himself/herself or themselves to the potential interviewee or discussants, clearly explain the objectives of the assessment without raising expectations. A good researcher is a good listener who asks short and simple questions such as what, how, why, when etc. without diving in, trying to explain things. Always combine your interview skills (ask, probe, confirm) with other techniques such as observations, and where you feel you need to take some photos, request for permission. At the end of the every interview, a vote of thanks needs to be given to the person(s) who sacrificed his/her their time in providing the information.

- *Household survey* – the household interview is normally directed to the head of the household, and where both the man and wife are available they can support each other in responding to the questions.
- *Local market survey* – local market interviews are normally directed to the sales person and not necessarily the owner of the business. Traders like any other business entities are always skeptical about being interviewed by “unknown” persons. It is always a good practice to move with a guide, preferably an official from the ministry of agriculture or trade who is familiar with the market and the traders. SSA practitioners should be very clear to the trader that they will not interfere with business, stopping the interview when required to allow the trader to serve a customer.
- *Agro-input dealer interview* – like local market survey, the interview is best conducted with the daily sales person. A guide from the ministry of agriculture or trade could be very useful in introducing the SSA researcher. Always follows the guide questions, and where necessary probe.
- *Focus group discussion* - this is normally with a group 6-12 of famers representing the village (not political representatives or leaders). It is important to understand the socio-cultural context of the community, and where women and men are not normally mixed (e.g. in predominantly Muslim communities), have separate FGDs with men and women. In some cases men and women can be mixed although at all times, care must be taken to allow all members of the FGD to voice their opinions.
- *Government staff, NGO staff* - an earlier appointment (telephone call a day before) with the key informant is necessary to avoid time wastage. An extension officer used as guide in a given location could be interviewed as you go along during the day. Always keep KII within 30-60 minutes.

2.3.7 Final exercises in the field

Data collection wrap up meeting on preliminary findings

Immediately after the field work, it is good practice for the SSA team(s) to assemble for a one day wrap-up meeting. On this day, team members present their key findings (KII, FDG, HHS, LMS, Agro-input dealer interviews) for discussion. Initial impressions of the state of seed security can be shared and emerging priorities for intervention discussed.

⁴ Much more detail on field work can be found in Annex 4.

Feedback to local leaders

Whenever possible a further half day should be taken before leaving the SSA area to give a preliminary feedback to local leaders. As well as being good practice and confirming to the principles of Accountability to Affected Populations, this exercise also allows some verification of initial findings and offers the opportunity for follow up on particular questions or issues.

2.3.8 Overall timeline for conducting an SSA in the field

A typical day in the field

Undertaking SSA field activities requires careful planning in order to save time and collect reliable data. A typical first day of SSA field work in a particular district can be summarized as below.

- a) **Team briefing:** a brief from the team leader on the site to be visited. He/she ensures that the team members have all the necessary data collection tools. The team leader, where possible, calls the contact person of that location to confirm their coming and the most probable time of their arrival.
- b) **Courtesy Calls to relevant offices:** the team should make courtesy calls to county or district government offices and also sub-county / district level. For the district level, the relevant senior officer (e.g. Director of Agriculture) should be briefed on the objectives and timetable of the SSA, and present selected sites (sub-county) to the authority for quick validation. A request is then made for an interview (KII) with the officer of his/her subordinate at their convenient time. This brief should not take more than 20 minutes. **At the sub-county office:** a similar courtesy call can be made to the agricultural officer in charge who will assist with giving a guide to assist the team. The officer at the sub-county could also be a potential key informant who could be requested for separate interview. This brief should also not take more than 30 minutes. The lower office could be useful in getting suitable guide (preferably an extension officer) to the selected villages.
- c) **Data collection at village level:** 5 – 8 hours depending on travel and season. On arrival in the village, the local leaders are notified (by the guide) of the presence of the assessment team to reduce any tension of having “strangers” within.
 - a. The enumerators: spend the entire hours collecting household data
 - b. FGD facilitators: whilst the focus is on the FGD interviews, the facilitators should also involve themselves in household interviews, market interviews and agro-input dealer interviews as appropriate and possible.
 - c. Team leader: goes for market trader, Key Informant and agro-input dealer interviews.

Note: sometimes agro-input dealers and local market traders are not within the village but in the nearby trading center. Therefore, the driver has to first drop the enumerators and the FGD facilitators, then go with the team leader to the trading center to interview the traders and/or KII.
- d) **Team gathering for pooling and discussing.** At the end of the day, the team assembles to pool summarize and discuss data (30 minutes – 1 hour). The key focus will be on the elements of the SSCF – availability, access, quality, suitability of varieties and resilience of the community.

For subsequent days in a particular district or sub-district, steps a) and b) are skipped and the team goes straight to step c). Once every 2-3 days / once a particular district / county has been covered the team should have a session where key emerging issues and findings are discussed and synthesized, again using the SSCF as an organizing framework.

2.4 Database design, data entry and preliminary analysis

2.4.1 Database design and management

Databases are used to handle large volumes of data. A well designed database takes care of all types variables collected during a survey and should be flexible enough to accommodate introduced or derived variables before and/or during data entry. In the case of SSA, it is recommended to use MS Excel as this is widely available and it is easy to create databases with this software.

SSA data entry clerks are strongly advised to make use of the database structure which has been designed by the FAO SSA development team.

The following steps should be done before the data entry starts:

- a) Review the questionnaires and codify further if needed
- b) Convert local units into standard units (sq m, kg, liters, etc.)

For the actual data entry process, it is possible to programme failsafe parameters into the database structure, making it impossible to enter data that is not consistent. This would reduce data entry errors significantly. So far this has not been done by the FAO SSA development team but is planned for 2015. In the meantime, a number of checks are necessary to validate the database including:

- a) *Take a random sample of questionnaires* and compare the data entered to the data entered on the database. If errors are frequent/significant, it might be necessary to review the whole data entry process – i.e. to verify the whole database against 100% of certain questions in the questionnaires.
- b) *Verify the logic within the database itself.* For example, if the answer to “do you own livestock yes or no” is “yes”, then there must be an entry of some sort against at least one of the livestock types in subsequent columns.
- c) *Identify outliers and decide how to deal with them* (correct them / delete them / ignore them / keep them).

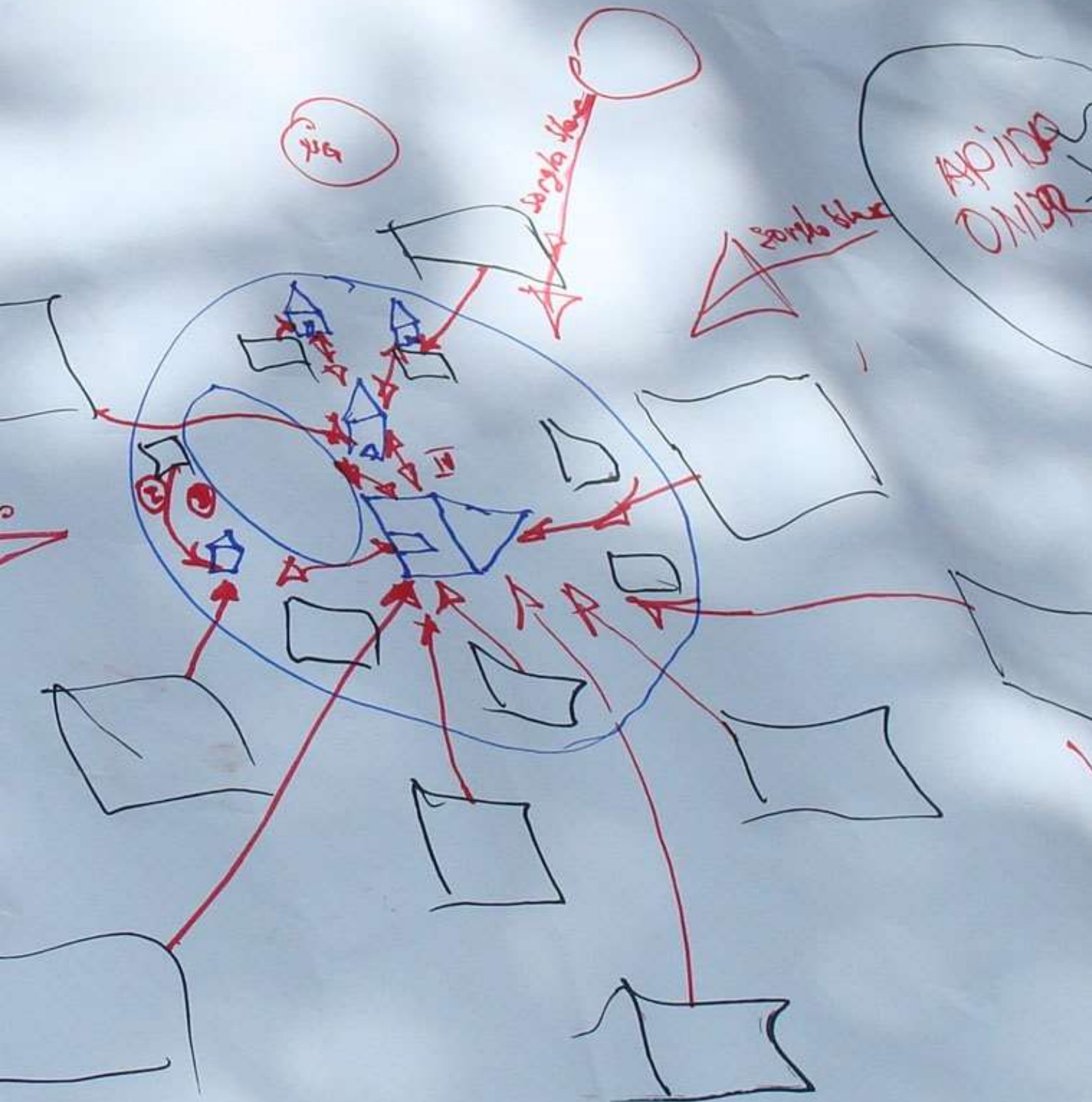
2.4.2 Data analysis

Before starting to analyze data it is necessary to be clear about the type of information required for reporting. There is a wide range of information available but not all the results are needed. Annex 8 gives guidance on analysis using PivotTable function available in Microsoft Excel (either with the MS Excel XP or MS Excel 2010 version).

The PivotTable feature is a user-friendly and easy-to-use tool, which is relevant for the kinds of analysis which is required in a SSA. For this reason it is recommended as a standard analytical tool for SSA. Other more sophisticated analyses are also possible, using statistical packages like SPSS. Such analysis would add value to the report but is not mandatory for the SSA practitioner⁵.

⁵ Further details on how to construct a pivot table are contained in Annex 8.

3. Interpretation of SSA results and making recommendations



3 INTERPRETATION OF SSA RESULTS AND MAKING RECOMMENDATIONS

3.1 Introduction

The primary task now is to review the analysis of the data and determine what interventions are appropriate. It is recommended that the findings are analyzed using the elements or parameters of seed security i.e. seed availability, seed access, varietal suitability and seed quality. Questions of resilience will be addressed through analyzing these elements and synthesizing the results.

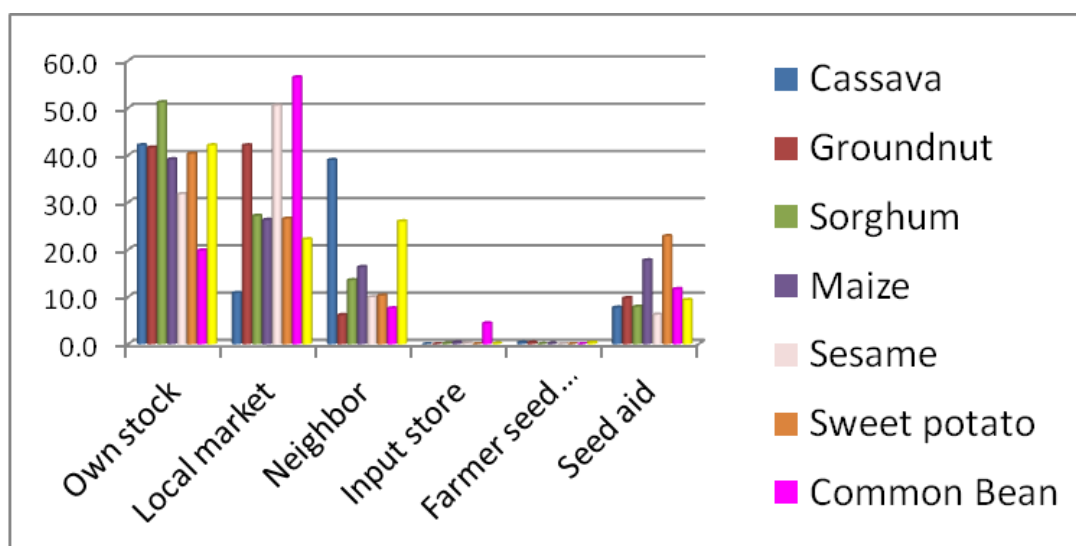
In all cases the kind of analysis that is done will depend upon the type of SSA that is being carried out i.e. post disaster, protracted crisis or non-emergency. In the case of a post disaster SSA, the key analytical technique will be to compare levels of each of the SSCF parameters for particular socio-economic groups and geographical areas before and after the disaster; in the case of a protracted crisis the most likely technique will be to compare current levels of the parameters for groups and areas with a non-crisis area of “normal / pre-crisis”. Finally, in a non-emergency context, the key issue will be to compare levels of the parameters across different socio-economic groups or geographical areas as a “situation analysis”.

The type of intervention that will be carried out can be divided simply into short term and longer term. Examples of each type of intervention for each element of seed security are given in the relevant sections below.

3.2 Seed availability

The analysis of **household questionnaires** can reveal the importance of the various seed sources. Figure 2 is an example from a situation analysis type of SSA. It provides valuable information on crops and seed sources and findings on the functioning of the seed system.

Figure 2: Main seed sources



This graph illustrates the importance of own saved seed (OSS)), local market seed (LoMS) and social network seed (SNS). The limited sourcing of seed from the formal sector and NGOs is also significant.

In this example, the informal sector represents almost 100% of the farmers' seed supply and this is common in most seed insecure areas.

Further analysis of **Focus Group Discussions** revealed that IDPs (Internally Displaced Persons) had limited OSS and SNS and had to rely on LoMS. At the same time the IDPs had limited assets to purchase seed, indicating a seed access problem for the IDPs.

Finally analysis of data from the **Agro-input dealer** questionnaire revealed the data included in the following table.

Table 1: Traders' perception of seed availability during present and next season in % of respondents

Crop Season	Maize		Rice		Groundnut	
	This season	Next season	This season	Next season	This season	Next season
Normal	25.5	22.2	30.2	26.8	21.4	36.4
Less than normal	58.5	46.7	57.0	59.8	78.6	63.6
More than normal	16.0	31.1	12.8	13.4	0.0	0.0

This table shows that a large majority of traders confirmed seed availability was perceived to be less than normal.

Implications of the analysis for intervention recommendations

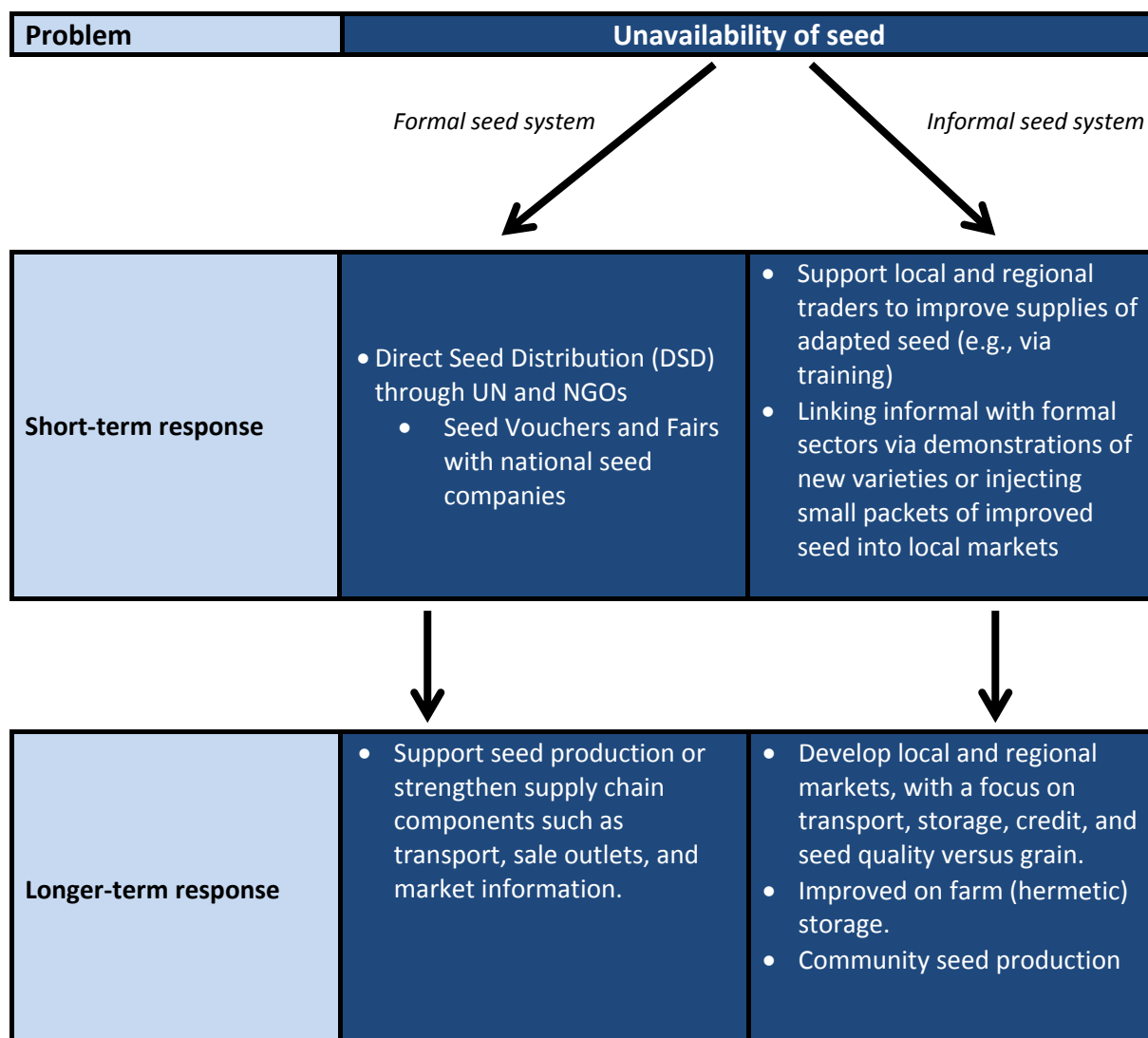
The key conclusions from piecing together the analysis from all three tools are:

- For resident populations, OSS, LoMS are the most important sources of seed followed by SNS.
- For IDPs, LoMS is an important source but access is hampered due to lack of purchasing power.
- Traders are pessimistic about availability of key seeds this season and next season, indicating a looming seed availability problem.

In these circumstances, interventions aimed at increasing seed availability for the resident population whilst simultaneously increasing seed access for the IDP population should be considered.

Focusing for the moment on seed availability, there are a number of options, both in the short term and the longer term. Some of the possible responses are indicated in Figure 3.

Figure 3: Response options for seed availability problems



Source: adapted from Sperling (2008)

It should be noted that there are certain requirements and potential caveats for each of these options. For example, DSD requires substantial logistical support and there are cases of late seed distribution due to delays in procurement or provision of poor quality seed or inappropriate varieties. Another example is on-farm hermetic storage which only works if the seed is very dry before storage. Community seed production, seed banks and community seed enterprises can be feasible longer term responses to shortages of seed but need to be carefully designed to ensure a level of sustainability. In all cases, some thought should be given to the practicality of the response in the specific circumstance in which it will be implemented: Are partners available and competent to distribute seed? What has been the experience with attempts to strengthen seed supply chains in the area? What are the critical constraints that would need to be addressed?

In addition to these supply side responses, in some circumstances when markets are well functioning and well integrated, demand side responses which focus on increasing purchasing power of local

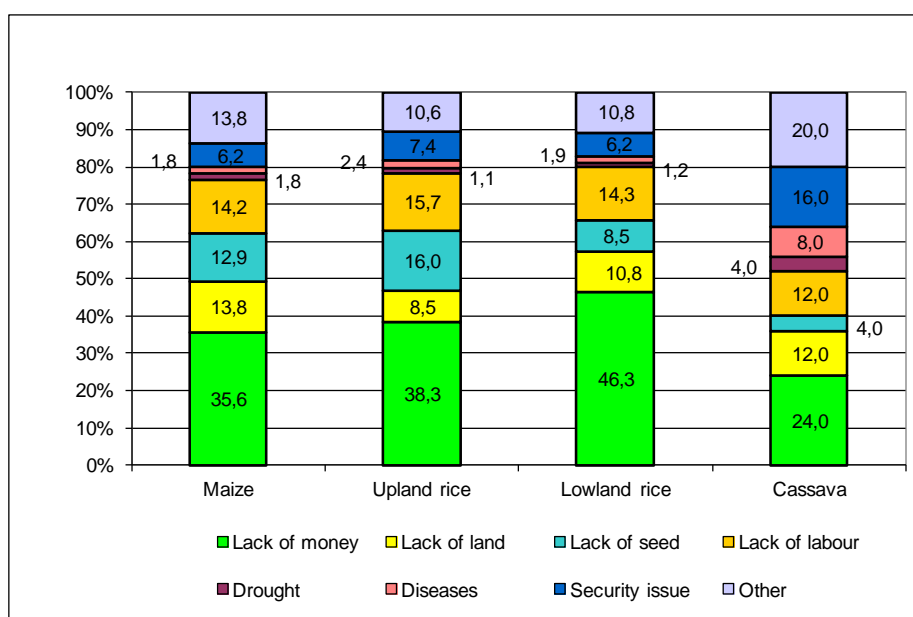
populations might also be relevant. This is because the increased demand can stimulate increased flow of seeds into the area from other areas where seed availability is not a problem. This could be the case in situations where seed availability stress is restricted to a few relatively limited pockets. Such action should be very carefully considered as if markets are not well connected and / or if seed availability is a more geographically widespread problem than simply pumping more money into an area (e.g. via vouchers) will not solve the problem. Rather it will make things worse by causing prices to rise.

3.3 Seed access

Seed access has proven to be a key issue in SSA due to the fact that in many cases seed security is constrained by a lack of income to purchase seeds. In the case of certain types of disasters, particularly drought, the main seed problems are on the demand side which characteristically falls because of the impact of the drought on household livelihood assets and income sources.

In the following example, data from the household questionnaire revealed that a key reason for not planting more seed was that farmers could not afford it (see Figure 4).

Figure 4: Reasons for planting less seed (in percentage of farmers that sowed less seed)



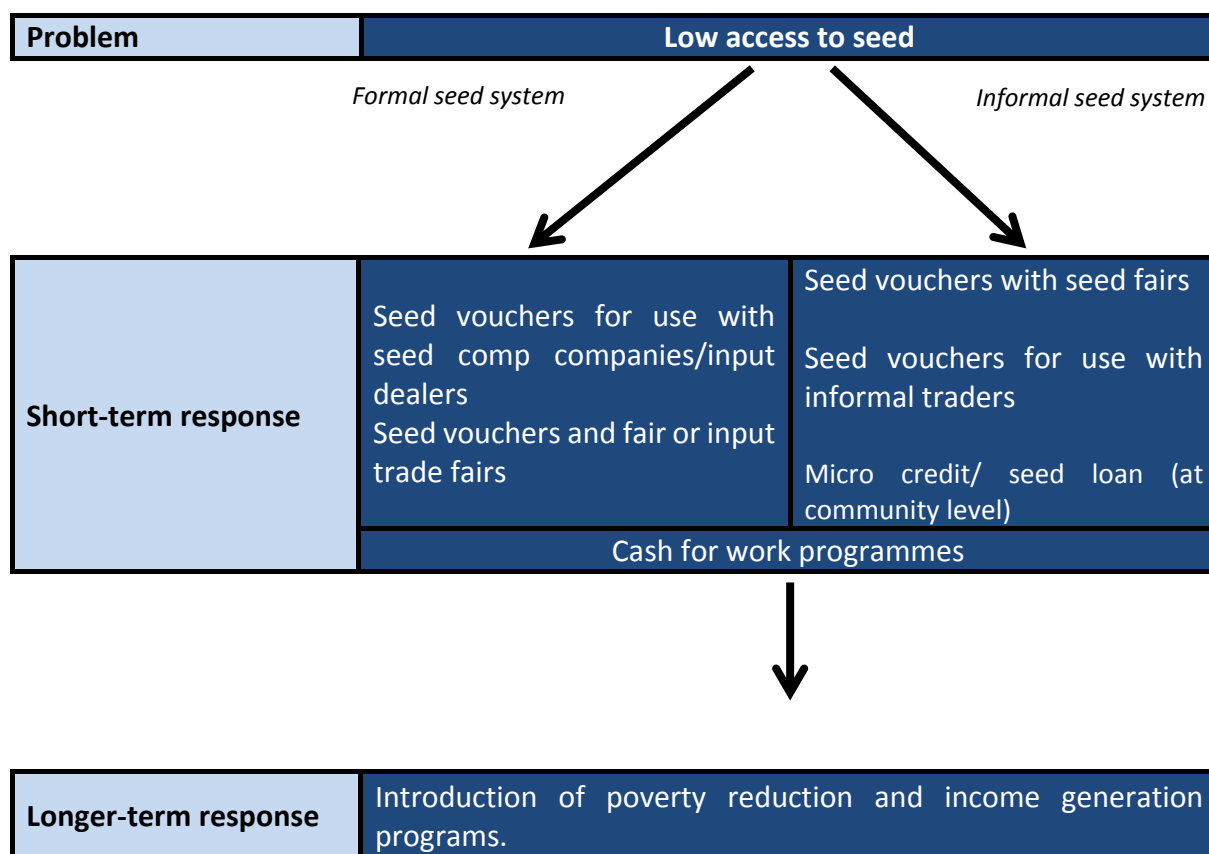
This example shows that the main reason for planting less seed is in this case the lack of money. Whilst seed availability problems do exist, they are much less frequently cited than lack of money – which leads to poor access to seed. In order to verify this, findings from the Local Market Survey and the FGD confirmed that prices of seed have not risen significantly recently and that there were no major issues with the availability of seed in local markets.

In order to address this kind of issue in the short term, it is important to increase the purchasing power of farmers to buy seed from local markets. This can be done by issuing seed vouchers for particular types of seed which can be redeemed either in a seed fair (informal sector) or with local seed suppliers (formal sector). Another option would be a cash for work public works programme. In the longer run, seed access can be addressed through general poverty alleviation programmes which increase incomes and thereby ability to acquire seeds.

It is very important to note that implementing seed access interventions when the main problem is seed availability can have damaging consequences through raising prices of already scarce seed.

Figure 5 below gives some further options to consider in cases where seed access is a major issue.

Figure 5: Response options for seed access problems



As with the interventions designed to increase seed availability, all of these options come with certain conditions and therefore may or may not be appropriate in any particular situation.

Seed Access Interventions

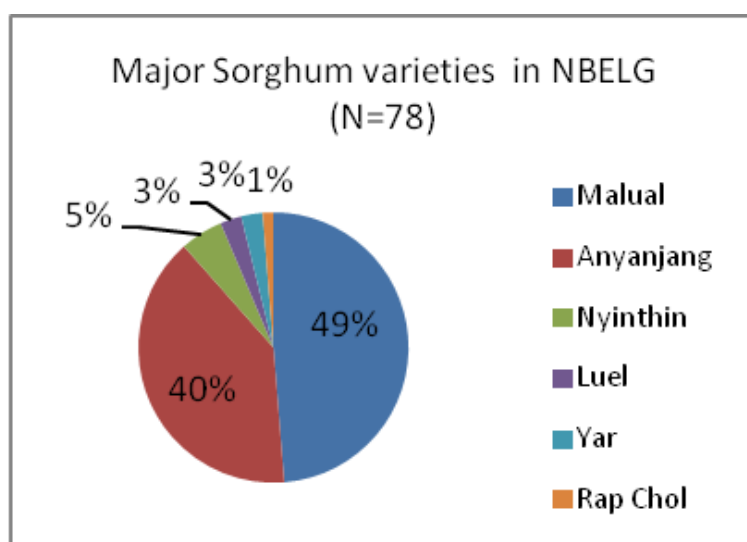
- **Seed Fairs:** the provision of vouchers to farmers and organizing specific seed/input fairs has proven to be an effective market based approach to improving seed security, allowing farmers to choose what they need, and bring seed producers and seed enterprises to the farmers.
- **Seed Vouchers:** here, farmers are issued vouchers which can be redeemed for seed provided by seed companies. This approach does not have the verification procedures that exist with seed fairs and it can restrict farmer seed suppliers.
- **Micro credit/ seed loan (at community level)** community level seed loans: common in some areas but require strong community leadership and ensuring the right variety is provided, the quality is good and managing the payment of the loan. **Cash for work** (provides means to purchase seed): a number of public works or asset creation schemes are possible which will increase incomes. Whilst this may increase purchasing power, it does not necessarily follow that more or sufficient seed will be purchased as the increased incomes can be spent on a variety of goods and services, including seed.

3.4 Varietal suitability

Understanding what varieties farmers are using, which ones they prefer and why, is key to identifying suitable interventions designed to increase both access and availability to seed. There is little point in introducing varieties which do not have the characteristics preferred by farmers.

In the following example, the analysis of FGDs found that over ten sorghum varieties are being grown in the district and about 3-4 varieties are grown per village. Further information from the household questionnaire revealed that among the various sorghum varieties, *Malual* and *Anyanjang* are the most popular, and are grown by 49 percent and 40 percent respectively of the households (Figure 6). *Malual* is red seeded, long maturing (6 months) and flood tolerant while *Anyanjang* is white seeded, short maturing (3 months) and preferred for food as well as bridging the hunger gap. In general, most of the local varieties cultivated in the state are considered well adapted and preferred by the farmers, as they know where and when to plant these varieties.

Figure 6: Major sorghum varieties in NBELG



During a FGD with women, it was generally agreed that sufficient access to preferred seed was a significant constraint and that availability of the seed was also becoming more of a problem with time. The women attested that the varieties (they could not remember the names) of sorghum and sesame received were not well adapted to the flood zone and were therefore not used. In addition, from the household survey, the improved varieties of sorghum (*wad Ahmed*), groundnut (*Serenut*, *Sodari*) and Sesame (Sesame 2) provided by humanitarian organizations such as FAO did not feature anywhere among the major varieties being grown by the farmers.

Implications of Varietal Suitability analysis for interventions

It is clear that the varieties preferred by farmers are not those which have been provided by seed relief agencies. Both access to and availability of preferred varieties is becoming a problem, suggesting a blend of access enhancing and availability enhancing measures. These could include:

Availability of suitable varieties

- Buy up of and then direct seed distribution of preferred varieties (short term)
- Facilitate the development of Local Seed Enterprise for the production of adapted varieties (longer term)

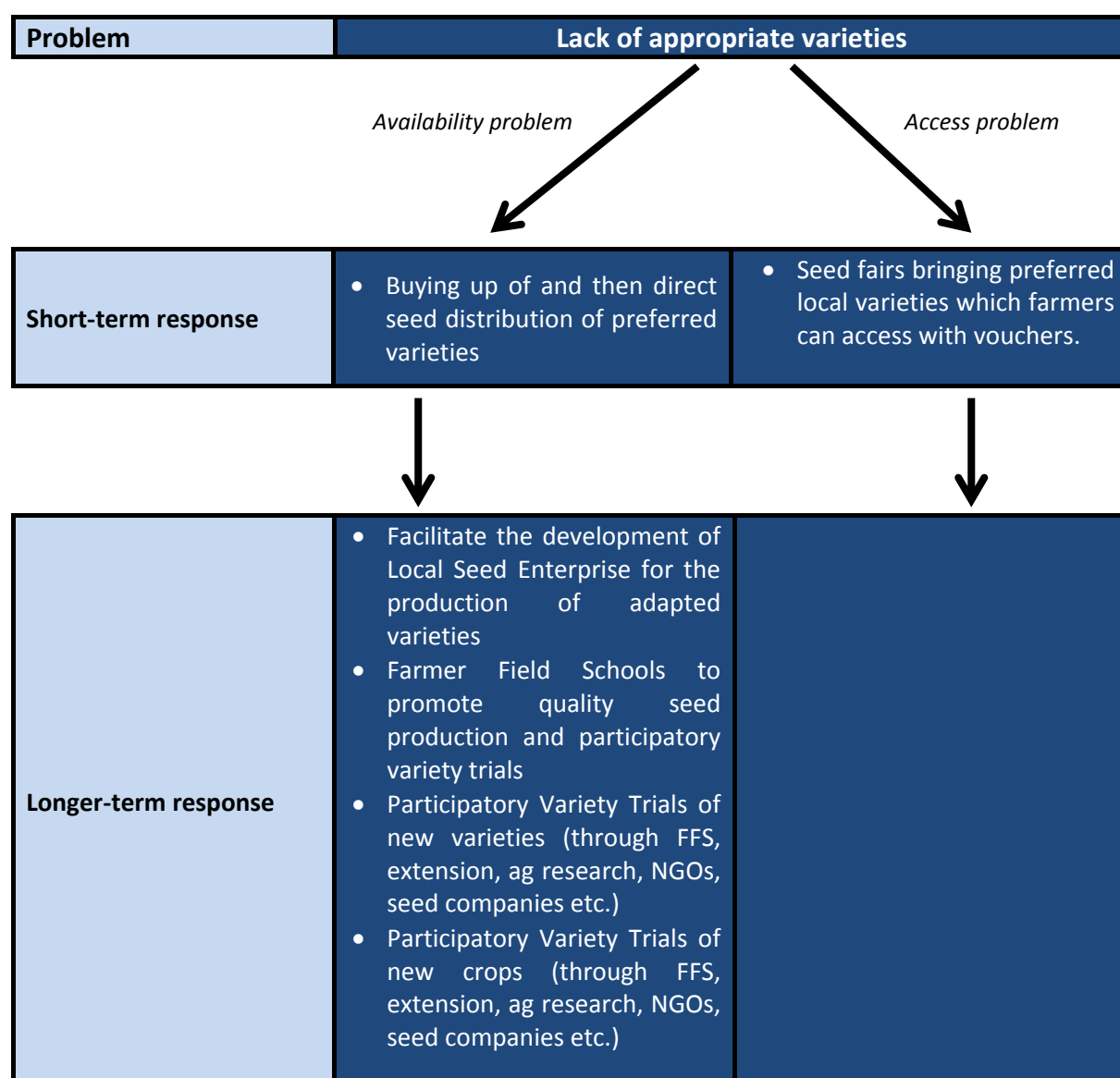
- Implement Farmer Field Schools (FFS) to promote quality seed production and participatory variety trials (longer term)
- Implement Participatory Variety Trials of new varieties (through FFS, extension, agricultural research, NGOs, seed companies etc.) (longer term)
- Implement Participatory Variety Trials of new crops (through FFS, extension, ag research, NGOs, seed companies etc.) (longer term)

Access to suitable varieties

- Seed fairs bringing preferred local varieties which farmers can access with vouchers (short term)

These options are represented in figure 7 below.

Figure 7: Response options for varietal suitability problems

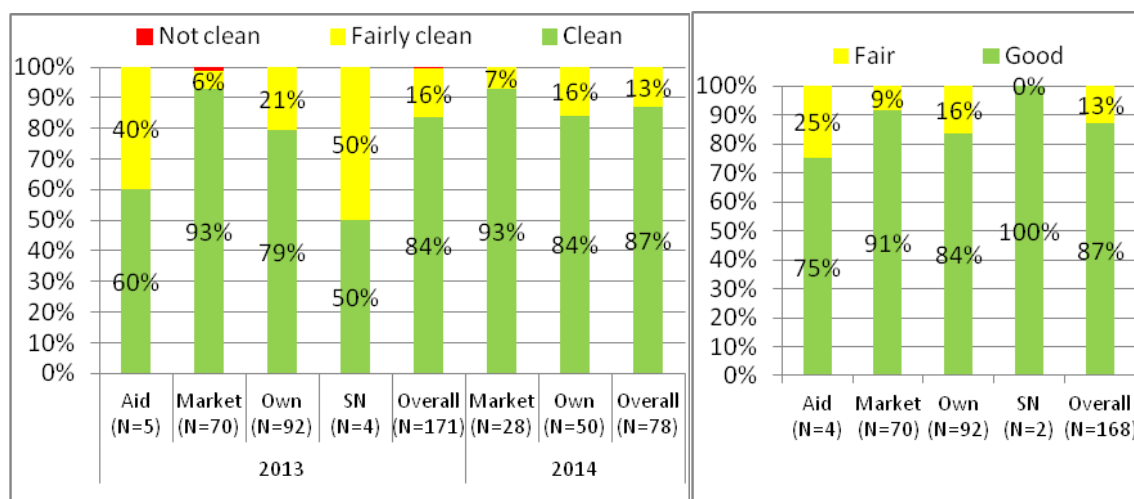


3.5 Seed quality

The description of the seed system should also provide insights on farmers' perception of the quality of seed of the different sources. In any given situation, farmers may have access to seed but it may be of poor quality, leading to low germination rates.

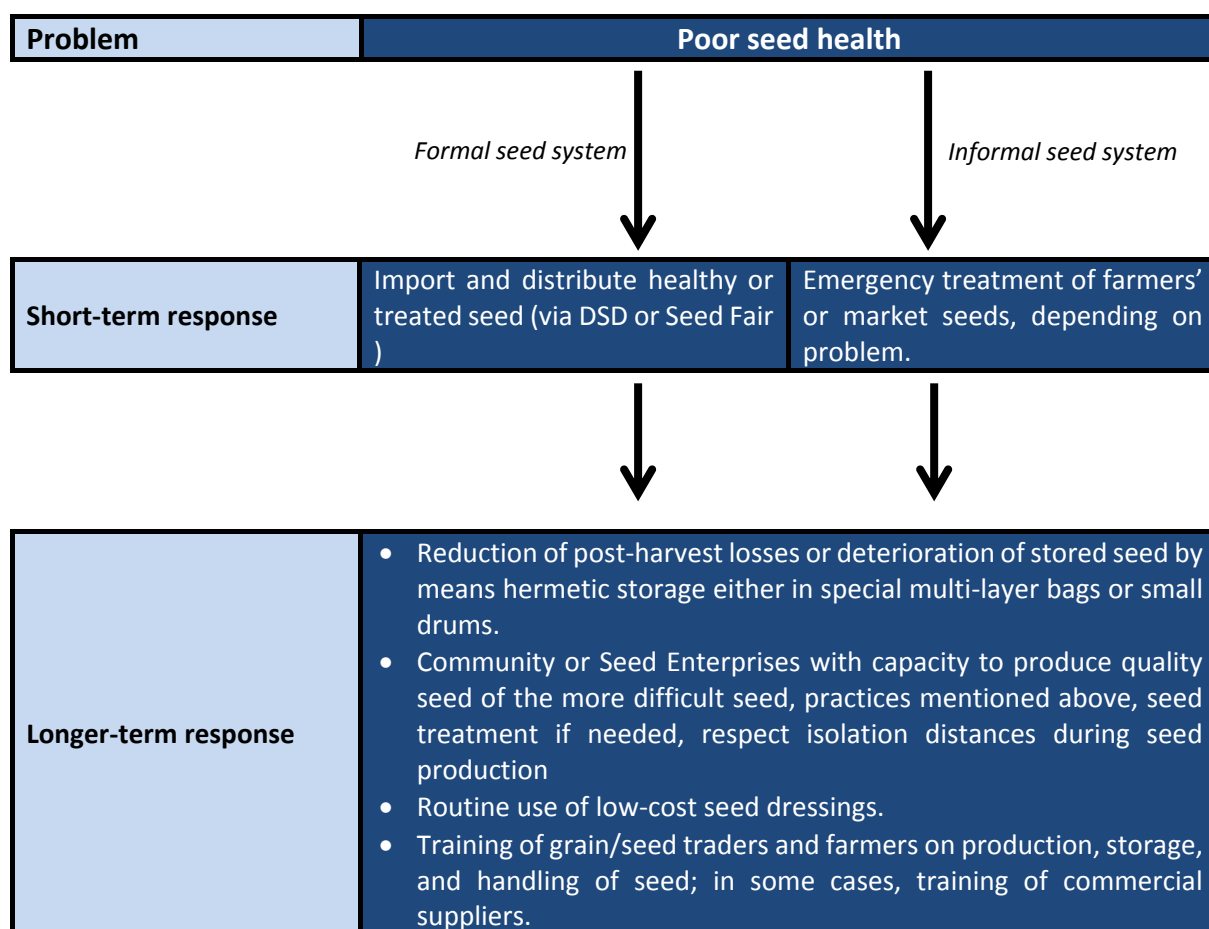
Data gathered in the household questionnaire found that both physical and physiological quality of seed was high according to farmers (see figure 8).

Figure 8: a) Physical and b) physiological (germination) quality of seed from various seed sources



On this basis, seed quality does not appear to be an important constraint to seed security. From a technical point of view, however, it would be advisable to follow up and to do sampling and testing of these sources of seed to verify the seed quality including OSS, SNS, LoMS, FSS and seed aid.

Figure 9: Response options for addressing seed quality issues



3.6 Resilience

Resilience means that farmers have adequate access to seed “at all times in both good and bad cropping seasons”. In order for this to be the case, households and individuals must be resilient to shocks and stresses faced by their seed systems. The degree of resilience is measured by the extent to which seed security is adversely affected by a particular shock or series of shocks. When faced with the same shock (such as drought) two farmers in the same village may exhibit different degrees of resilience to the shock in terms of their seed security. Thus one farmer may become seed insecure as a result of the drought (not resilient), whilst another remains seed secure (resilient). Some households may be susceptible to very small shocks, in which case we can say that they are highly prone to seed insecurity (very low resilience).

Resilience is manifested in the degree of seed security in terms of seed availability, seed access, seed quality and varietal suitability after a shock. Thus it can only be directly measured by changes in indicators for these aspects. In the SSA this can be done in different ways. Using the household questionnaire, it is possible to identify different types of household and see to what extent they are resilient to a seed security shock such as a flood or drought. Resilience of a household is also based on the following parameters: diversity of income sources, diversity of crops planted, available assets. Household types that are less resilient can then be targeted for different kinds of interventions which would enable them to be more resilient to the next shock. The kinds of interventions would be no different from the ones already listed under the other parameters of seed security.

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ANNEXES

ANNEX 1: OUTLINE OF SSA CONCEPT NOTE

It is difficult to overstate the importance of a well constructed SSA Concept note. The concept note is a critical foundation for the whole SSA process, and should clearly set out the background to the assessment, the objectives, the timeline and the overall budget. The key areas to be included in the concept note are as follows:

1. *Title:* This should be concise. A good one should be able to define the geographic or livelihood zone coverage within a given country e.g. Seed Security Assessment (SSA) in the marginal south-eastern livelihood zone of Kenya OR Seed Security Assessment (SSA) in Makueni, Tharaka-Nithi and Kitui Counties in south-eastern Kenya.
2. *Assessment period:* Indicate the month(s) and year in which the assessment will be conducted e.g. November, 2014. or Nov-Dec, 2014.
3. *Introduction and background:* A brief introduction on the contribution of agriculture to the economy of the country, particularly to its GDP and export where possible. Provide narrative statement on the proportion of the population which depends on agriculture for their livelihood; the contribution of the formal and informal seed sector; dependency of agriculture on either rain-fed or irrigation or both; the predominant farming agro-ecologies of the country, and ones that are predominant in the target zone. The recent disaster or recurrent crisis in the target zone and how it affected agricultural production in a given year or season; seed security responses or intervention used in the recent past. The assumptions or reasoning behind those interventions.

Briefly discuss the seed industry in the country and where necessary compare it with other countries within the region; also examine whether existing seed policy and regulatory framework recognize the co-existence of both the formal and informal seed sectors. Are there some notable seed policy and regulatory issues worth noting in the background? Was there any previous seed security assessment conducted in the target zone or similar agro-ecology in the country? Give brief highlight of the key findings and recommendations from this assessment; stress the importance of seed security assessment; and explain why want to do the assessment.

4. *The Assessment Objectives and the scope:* The overriding goal of any seed security assessment (SSA) is to understand the seed security situation of the target or affected communities based on the elements of the seed security conceptual framework (SSCF): seed availability, access, varietal suitability and quality. The specific objectives will vary according to the situation. In this regard, it is useful to think in terms of three broad kinds of situation
 - a. Post-disaster / emergency: Here the current seed security situation may be compared with the situation before the disaster
 - b. Non-emergency/baseline: In this case, the SSA takes the form of a situation analysis: i.e. it focuses on current seed security without comparing to the past.
 - c. Protracted crisis: In a protracted crisis, seed security may fluctuate according to periodic worsening or improvements in the situation. Here knowledge of what is considered "normal" may be useful in comparing protracted problem. A sudden change in seed security within the overall context of a protracted crisis may warrant looking at the before and after technique.

5. *Target SSA zone:* Brief description of the target zone – area, population size, farming characteristics and agro-ecological zones of interest. Why these agro-ecologies? Who are key players supporting food and seed security in this zone if known? What are they doing? A map of the zone showing the various agro ecologies and/or administrative boundaries would be useful for the reader to visualize the target area.
6. *Stakeholder analysis and responsibilities:* The Concept Note has to identify direct stakeholders who will be the key actors in the implementation of the assessment activities – training, data collection, data analysis and reporting, and those that will most likely take actions based on the recommendations of the assessment. Even within the organizations that are participating in the assessment process, departments which will play some pivotal roles need to be identified. Broadly, the following stakeholders could be directly involved or consulted; Government relevant ministries (Agriculture and Livestock; Trade, industry and commerce; Cooperative and Rural Development), donors (where there is need for additional funds); United Nation Organizations and Programmes (FAO, WFP, UNICEF, UN WOMEN) and Local and International NGOs; Community based organizations; Nation Agricultural Research System (NARS) and International Agricultural Research Centers (IARCs).
7. *Definition of outputs:* Main output of any SSA is the report. Summary of the action plan could as well be produced by the assessment team in consultation with the direct and indirect stakeholders.
8. *Activity Time Frame:* This could be summarized as in the table below.

Activity	October		November				December		Responsibility
	3	4	1	2	3	4	1	2	
1. Identification of partners (NGO, MoA)									FAO Kenya
2. Review of background information									FAO Kenya/REOA
3. Training of field staff (3 days)									TOT part.
4. Field Data collection									SSA Team
5. Preliminary findings workshop (1 day)									SSA Team
6. Data Mgt, Analysis and reporting									SSA Team
7. Validation Workshop (s) (1 day)									SSA Team
8. Development of Plan of Action (PoA)									Stakeholders
9. Final Report and PAO to stakeholders									SSA Team/stakeholders

9. *SSA Organizing Team:* Where necessary, names and contact of SSA organizing team could be included for easy reference and consultation.

Names	Organization/departme nt	Roles	Contact
1. Daniel M.	FAO Kenya (Kitui)	Team leader	
2. Simon M.	FAO Kenya (Nairobi)	Economist	
3. Wilson R.	FAO Kenya (Nairobi)	Agronomist	
4. Joseph O.	FAO REOA (Nairobi)	Data analyst/technical advisor	
5. Philippe L.	FAO AGPM (Rome)	Trainer/Technical advisor	
6. Omondi. P.O.	Somali Aid (Nakuru)	Trainer/FGD facilitator	

10. *SSA Budget*: a clear budget needs to be drawn, especially where adequate funding for the assessment has not yet been secured. The budget required for the assessment depends on factors such as the assessment scope and coverage; transport cost; number of people going to be involves; number of days need to completed the field work etc. Finance unit of the organization could be consulted after coming up with a draft budget. A typical budget for a SSA can be seen in Annex 2.

ANNEX 2: CONCEPT NOTE AND BUDGET FOR SSA IN KITUI, MAKUENI AND THARAKA-NITHI COUNTIES, KENYA, NOVEMBER 2014

1.0 Introduction

Agriculture is the major contributor of the Kenyan economy. It is the leading economic sector, accounting for 25% directly of the gross domestic product (GDP) and accounts for 65 per cent of Kenya's total exports. About 75% of Kenyan population depends on agriculture as source of livelihood, and accounts for about 18% of the wage employment. Kenya's agriculture is mainly rain-fed and dependent on the bimodal rainfall in most parts of the country. It's predominantly small-scale farming mainly in the medium and high-potential areas accounting for 75 per cent of the total agricultural output and 70 per cent of marketed agricultural produce. A large proportion of the country, accounting for more than 80 per cent, is arid and semi-arid land (ASAL) with an annual rainfall average of 400 mm. Droughts are frequent and crops fail in one out of every three seasons. With increasing population pressure in high and medium potential areas, the future of agriculture is in ASALs where large land remain land remains underutilized.

The Kenyan farmers depend on both the formal and the inform seed system. Formal seed sector is one of the most vibrant in the eastern and central Africa, with over 60 seed enterprises. However, the informal sector still accounts for over 80% of the total seed used in the country, with its contribution being even much higher in ASALs. The national requirement of certified seed ranged from 28,000 to 35,000 metric tons, with maize accounting for over 80% of the total volume of certified seed.

Achieving FAO Kenya country programming framework (CPF) outcome 2 of increasing agricultural productivity of medium and small scale producers will require a well-functioning seed system. A well-functioning seed system is one that uses the appropriate combination of formal and informal channels to efficiently meet farmers' demands for quality seeds of suitable crop varieties. While the seed industry in Kenya is better developed compared to other countries within the region, high cost of seed relative to other inputs, coupled with the inability of the formal seed system to meet the demand by farmers have been cited as bottlenecks to the seed industry (Nyoro and Ariga, 2004). In the Arid and Semi-Arid Land (ASAL), recurrent drought and crop failure have been frequently cited as source of seed insecurity. In addition, poor legislative and regulatory framework in the seed adversely affects access to improved seed and planting materials by farmers. Since the liberalization of the seed industry in 1996, private sector participation has increased, with a number of private seed companies being registered to produce seed, thus reducing the monopoly that the Kenya Seed Company has enjoyed for a long time. While it was widely expected that this would lead to improved accessibility to quality seed and hence increased efficiency, agricultural productivity has generally been low and shown declining trends.

Efforts by government and humanitarian actors to improved availability and access to quality seed of adapted crop varieties by marginal farming households have been focusing on providing maize seed and seed of other traditional high value crops such as pigeon peas, cowpeas, beans and some other legumes in the ASAL regions. Though this is widely appreciated, very limited efforts is normally put in understanding the elements and magnitude of seed insecurity of the target population

2.0 Seed System Security Assessment

Although, a comprehensive seed system security assessment was carried out in 2011 in Eastern and Coastal Kenya, this assessment provides baseline synopsis in the face of recurrent drought. Understanding the dynamic of seed security therefore requires regular assessment for better seed and food security programming. It's against this background that FAO Kenya, with support from ECHO funded Global Food Security Capacity building through FAO Sub-regional Emergency Office for East and Central Africa (REOA) is seeking to jointly conduct a Seed Security Assessment (SSA) in the southern marginal agricultural livelihood cluster of Kenya.

The Southeastern Marginal Agriculture Livelihood cluster comprises of five counties namely; Makueni, Kitui, Tharaka-Nithi, Meru (North) and Embu (Mbeere). It covers an area of 47,348 square kilometers and has an estimated population of 3,032,460 persons. The cluster has two major livelihood zones;

- a) Marginal Mixed Farming livelihood zone representing 65 percent of the population, and
- b) Mixed Farming livelihood zone representing 26 percent of the population.

The main sources of income for the cluster include; Crop production which accounts for 40 percent of the total household income, Livestock production accounting for 35 percent and Employment at 25 percent. The target counties for the assessment are Makueni, Kitui and Tharaka-Nithi.

The Assessment Objectives

The main objective of the assessment is to examine and analyze current seed security situation and provide directive in supporting seed sector development in the Southern Marginal Agricultural Livelihood cluster,

Specifically, the assessment will:

- a) Critically and constructively review past emergency and rehabilitation seed-aid related activities in the in three counties to provide lessons learnt.
- b) Assess the current seed security situation (availability, access, quality, varietal suitability and resilience) among farmers households, including women and youth within the agro-ecological systems in the three counties
- c) Provide a comprehensive information base (report) on which to design appropriated seed system support intervention linked to promoting agricultural growth and seed security.

2.1 Key activities

FAO Kenya office: in collaboration with other key stakeholders, carries out the following activities in order to achieve the above objectives.

- a. Arrange for all the necessary logistics necessary for conducting seed security assessment as well as coordinate with all the relevant key stakeholders.
- b. Review the food and nutrition security in the three counties in order to provide some background to the assessment;
- c. Adapt appropriate tools and methodology for data collection, entry, analysis and reporting with consideration of community participation.
- d. With support of the seed system specialist, provide training, technical assistance and coordination of the Seed Security Assessment;

- e. Provide leadership throughout the data collection, analysis and reporting period, and provide a mechanism for feedback to the community.
- f. Facilitate discussions between FAO and partners based on the results of the assessment in order to draw the main findings of the assessment, give and adopt suggested recommendation, and develop an action plan.
- g. Present the main findings, recommendations, plan of actions to FAO staff, donors, Ministry of Agriculture, livestock and Fisheries (MoALF) and partners through workshops at state level.
- h. Prepare the SSSA report highlighting the methodology used, results, conclusions and recommendation
- i. Develop and action plan for addressing critical seed security problems identified during the assessment

FAO REOA-Nairobi and AGPM-Rome

- Provide technical assistance to FAO Kenya for the implementation of the assessment;
- Participate in the discussions on the results and findings of the assessment;
- Review the documents produced within the assessment and especially the final SSSA report
- Participate in the Final workshop

National and County Government;

- Provide additional human and logistical support
- Provide secondary data

NGO Partners

- Support data collection, analysis and reporting
- Provide secondary data

2.2 Definition of outputs

- Final SSA report
- Summary of the action plan for supporting the development of the seed sector in the three counties

Budget

S/No	Activity/item	Unit	Days	Unit cost	Total (KSh)	USD (\$)
1	Training					
1.1	Conference package	15	3	4,000	180,000	2,029
1.2	Scholastic materials	12	3	100	3,600	41
1.3	Accommodations/DSA	15	3	6,000	270,000	3,044
1.4	Transport	2	1	15,000	30,000	338
	Sub-total				483,600	5,452
					-	-
2	Administrative and support staff cost				-	-
2.1	Special consultants⁶ (optional)	1	10	16,000	160,000	1,804
2.2	Data clerks ⁷	3	9	5,000	135,000	1,522
2.3	Administrative cost	1	5	14,000	70,000	789
	Sub-total				365,000	4,115
					-	-
3	Field work				-	-
3.1	Transport	2	10	15,000	300,000	4,059
3.2	Daily Subsistence Allowance	15	10	6,000	900,000	12,176
3.3	Equipment and tools	1	1	20,000	20,000	225
	Sub-total				1,460,000	16,460
					-	-
4	Preliminary findings workshop				-	-
4.1	Conference package	15	1	5,000	75,000	846
4.2	Scholastic materials	15	1	100	1,500	17
4.3	Accommodations/ Daily Subsistence Allowance	15	1	6,000	90,000	1,015
	Sub-total				166,500	1,877
					-	-
5	SSA Validation and Action Plan Workshop(s)				-	-
5.1	Conference package (optional)	30	1	5,000	150,000	1,691
5.2	Scholastic materials (optional)	30	1	100	3,000	34
5.3	Accommodations/Daily Subsistence Allowance	10	1	6,000	60,000	676
5.4	Transport	10	1	4,000	40,000	451
	Sub-total				253,000	2,852
					-	-
	Grand Total				2,488,100	28,051

⁶ A comprehensive SSA may require specialized consultants to do specific reviews such formal plant breeding

⁷ can be inbuilt within the SSA field team

ANNEX 3: SAMPLING AND SAMPLE SIZE

Sampling is the selection of a representative part of a population in order to determine parameters or characteristics of the whole population. A **sample** therefore is the proportion of the population selected for the study or investigation. A **Sampling unit** is that unit about which information is collected and that provides the basis of analysis. In survey research, elements are people or certain types of people. **Sampling methodology** or design refers to a set of rules or procedures that specify how a sample is to be selected. This can either be probability or non-probability. In probability sampling it is possible to assign levels of confidence about the reliability of the sample from a statistical point of view. In non probability sampling it is not. In SSA, households are selected using probability sampling, whereas all other sampling units (individuals for community FGD, traders, officials, NGO representatives, seed producers) are not. In the case of units, representativeness relies upon purposive sampling.

In probability sampling, sampling is often done so as to ensure a 95% level of confidence in the estimates derived from the sample. The number of units required to achieve this will increase as the heterogeneity within the overall population increases. Thus the sample required for 95% confidence in a population with consists of residents, IDPs and refugees will probably be higher than a population consisting of just residents. In situations where there is heterogeneity, separate samples would need to be calculated for each population group, increasing the size of the overall sample.

As a rule of thumb, in relatively homogenous population groups of 10,000 units or more which are normally distributed, the sample sizes necessary to achieve different kinds of accuracy are given in Table 2.

Table 2: Level of reliability and Sample size for a population above 10,000 households

Level of reliability	75%	80%	85%	90%	95%
Sample size	133	165	210	270	384

When the population size is smaller than 10,000, there will be some reduction in the sample size, as shown in Table 3.

Table 3: Reliability level and population adjusted sample size

Population size	Reliability level				
	75%	80%	85%	90%	95%
500	105	124	148	176	217
1,000	117	142	174	213	278
2,000	125	152	190	238	322
4,000	129	159	200	253	350
6,000	130	161	203	258	361
8,000	131	162	205	261	366
10,000	131	162	206	263	370
20,000	132	164	208	266	377
50,000	133	164	209	269	381
100,000	133	165	210	270	383
200,000	133	165	210	270	383
500,000	133	165	210	270	384

At the end the final sample size will be a trade-off between the theoretical best practices, applying the above mentioned formulas and the available resources – human, financial, logistics and time. This trade off will influence the final level of reliability at the selected site level. The final decision on the sample size during surveys preparatory phase often requires the responsible person to make a decision as he/she has to make a tradeoff between those two components (statistically optimal sample size and available resources).

Once the overall sample size has been determined at one administrative level (e.g. regional/provincial level), this sample size can be divided proportionally to the populations of entities at the next administrative level down (e.g. Counties or district). If geographical entities at the lower administrative level have similar population sizes, then the overall sample size can be divided equally among the selected entities. The different sizes of sample will have implications for the time required to cover each district, as illustrated in Box 5.

Box 5: Example on determining sample size at county or district level

- a) The overall sample size at regional level is 384, and within the region, three counties have been selected to represent the various agro-ecologies. The size of each sub-sample is determined by the relative size of the population in each of the districts. If the populations of the districts are roughly equal then a sample of 128 households needs to be interviewed from each of the three counties.
- b) On average, a team of five is able to interview 20 households, 3-5 LM traders and 1-3 agro vet. Therefore, each team will need a minimum of $(126/20)$ 7 working days to cover each district
- c) If the three counties on the other hand have proportionally very different population size, Say $X=9000$; $Y= 7000$ and $Z= 4000$ (Total 20000), then the sample size for each district would be:
 - $X = 9/20 \times 384 = 173$
 - $Y = 7/20 \times 384 = 134$
 - $Z = 4/20 \times 384 = 77$

Therefore, a team of five going to X will require 9 days $(173/20)$, Y will require 7 days $(134/20)$ and Z will require 4 days $(77/20)$.

Sampling methods at community level for Household Questionnaire

Sampling of households within a village after determination of sample size is done by use of probability sampling. Simple random sampling would be the most appropriate process, as each of the potential sampling unit (households) within the population has the same opportunity to be selected under this approach. This however is time consuming, especially where the population is dispersed over a wide geographic area. In most cases systematic random sampling may be preferred for practical reasons.

Box 6: Example on systematic sampling

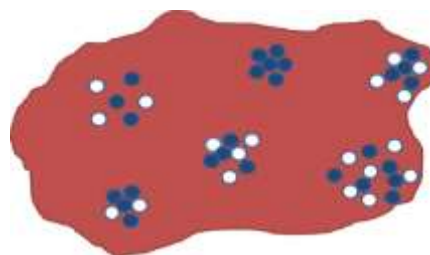
In a systematic sampling, a prefixed pattern is normally used, to logically skip certain number of household at an interval. If for instance it is estimated that there are 20 households along a given transect, and the enumerator moving along that transect expect to interview 5 households along that transect, then he/she can determine the sample interval (SI) as flows

$$SI = \frac{\text{Number of households (e.g. 20) along the transect}}{\text{Number of households (5) to be interviewed}} = 4$$

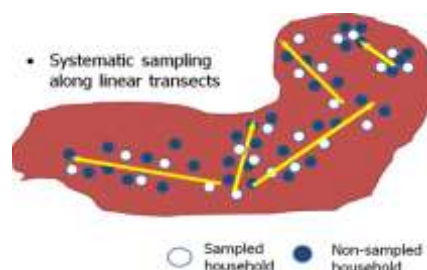
The sampling interval therefore is 4, and the enumerator will therefore skip 4 households after every sample taken. The distance to be covered by a numerator walking along the transect needs to be put into consideration. Therefore, transect needs not to be more than 3 km.

The pattern of settlements and the heterogeneity of the village will determine the type of systematic sampling. The pattern of settlements can be noticed as the team drives into the village and or through some quick questioning of local residents. Generally speaking, there are basically three common types of settlements:

- a) *Clustered households* – this consists of groups of 4-10 households clustered within a very close proximity (radius of 20-10m) to each other and separated with a reasonable distance (200-800 m) from another cluster. This is very common in agro-pastoral communities. Here, the most appropriate method is to randomly sample 4-8 clusters and within each cluster, randomly sample 3-5 households.

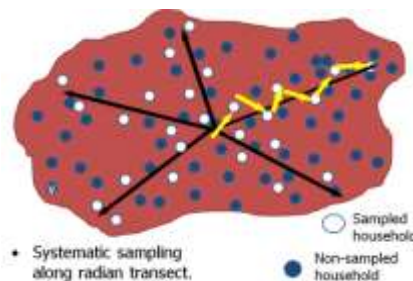


- b) *Linear settlement* – Here the households normally settle along natural or man-made features such as at the foot of the mountains, along the river beds, along the trunk roads. However, crop (cultivation) fields might be scattered within a village. Here systematic sampling (Box 6) is normally deployed along the linear pattern of settlement. As the team drives into the village, they need to take note of how far the households are from one another as this will also influence



the number of households that could be interviewed in that village/location. The wider the distance between neighboring households, the more time needed by the enumerators to move from one household to another.

- c) *Scattered households* – Here there is no well recognized pattern of settlements. The households are considered randomly scattered with the village. Here, like in linear settlement, the team needs to take note of how far the households are from one another as also. The most appropriate sampling method is the systematic sampling along 3-6 radian transects depending on the number of enumerators. Each of the enumerators could move long one transect, sampling households at regular intervals.



NOTE: These sampling schemes assume homogeneity. If the village is split into different groups (e.g. IDPs, returnees and residents) then this would ideally require sub-sampling.

ANNEX 4: TIPS FOR FIELDWORK

Dos and don'ts of direct observations

Dos

- Avoid pre-conceived notions and fixed expectations.
- Note what is seen and what people say crosscheck or verify inconsistencies.
- Sometime agree on the advice of people met during the visits / FGD and use the opportunity to observe things which were not planned.
- Also observe sites / household outside of predefined roads, paths or natural boundaries to have a balanced and whole view of the conditions.
- Record contradictory or unexpected information.
- Keep focused and active during observation on the issues mainly elated to the Seed Security System.
- Be curious! Observation is not just about seeing with the eyes but with all senses, like hearing, smelling, tasting and feeling.
- Be aware of what has not been seen. Record damages or lack of services and infrastructure due to the disaster.
- Respect local culture. Assessors are observed as much as they are observing.
- Follow local rules of behavior, such as not smoking during interviews / FGD.
- Be aware of gender dynamics and make sure that the assessment team reflects the same dynamics.
- Be inclusive in gender if needed make gender specific FGD.
- Be sensitive to local concerns. For example, assessor should not eat or drink in public if there is a shortage of food and water.

Don'ts

- Begin with expectations of what is going to be seen or record data chiefly to prove a pre-existing hypothesis.
- Rely on memory but write down observations on a checklist or record sheet.
- Record both what is seen and what was expected but not seen.
- Focus solely on misery and destitution. Be aware of capacities, opportunities and social capital within the affected community.
- Be intrusive. Take steps to be as sensitive and respectful as possible: observation should be as discreet as possible.
- Take pictures without asking permission first.

Instructions for an enumerator

- Write clearly with a ball pen;
- Don't use signs which are not common known or foreseen;
- Don't read out the different options / possibilities given and codified in the questionnaire, leave the respondent to give his options, unless asked specifically for a specific question;
- Cycle around the number of the code in the response list of the questionnaire, this facilitates the data entry staff in seeing the selected number (code);
- If the respondents wants to change his response or modify; then bar the encircled code with a double cross and encircle the correct code; or if numeric information bar the firstly written number and write the correct number aside;
- The enumerator has to make sure that all the questions are addressed to the respondent. There are different options in case he doesn't want to respond as follows: don't know (DK), no response (NR), don't want to answer (DWR) or not applicable (NA).
- All the sections of the questionnaires are important and have to be addressed;
- The questions should be made along the sequence given in the questionnaire and not jumping from one sector to another and going back to an earlier section;

- The responses are directly written into the paper format of the questionnaire. It is not permitted to write them first into a notebook and thereafter transfer the information into the questionnaire. Observations, remarks, inconsistencies can be recorded in a notebook or on the backsides of the questionnaires:
- Don't use abbreviations, except the common used standard measurements units (kg, ha, g, l, etc.)
- All the given cells in a table have to be filled in order to have the complete information gathered, except the question is on a specific respondent not applicable, then please mention this fact;
- The enumerator and the supervisor should have the commitment to bring the data gathering to a successful end and that the results and the conclusions drawn afterwards depend mainly on the quality of the data gathered. Nothing which is asked is not needed or less important and the interview has to be conducted as instructed in the training sessions.
- The indications received have to be followed closely. If not applicable request the supervisor to give you an alternative solution / method, this applies also to the selection of the households of be interviewed. The coordinator or lead person of the survey or the study has to be consulted in case modifications are needed to be made and only with his green light implemented.
- The enumerator has to crosscheck the questionnaire before leaving the homestead of the respondent, in order to make sure he obtained all the required information;
- Thereafter the questionnaires, at the end of the day, have to be presented and again verified together with the team leader or supervisor; He decided if the questionnaire is useful and is retained or if it has been replaced by another interview. There is also the possibility to correct or rite clearly the responses if not readable at that moment;
- All the gathered data is treated strictly confidential. They can't be disseminated neither by the enumerator, team leader or supervisor. The information / results are only disseminated once the whole report has been finalized or preliminary information can be shown through a presentation to the interested stakeholder.

Example of enumerators guideline

• **Introduction**

These guidelines are for Seed Security Assessment (SSA) data collectors (enumerators) at household levels. The main purpose of the SSA is to understand the seed security situation of the community at household levels in the target locations. This will allow effective programming for appropriate measures needed to mitigate any seed insecurity problem identified during the assessment. .

These guidelines will help you in conducting successful SSA interview with selected households. The SSA is designed by FAO and the field work (interviews) conducted by the different implementing partners of the project. The implementing partners, who hired you to do the field work, are responsibility for all contractual arrangements of the data collectors (enumerators).

• **Preparation for Interview**

Before you head to the field you should understand clearly the purpose of the SSA and know exactly the required information of the questionnaire. You should make all necessary preparation as far as possible before hand work plan, etc. to make your work in the field easier and enable you to concentrate to get the correct information. It will be beneficial to you to take care of following points:

- You should try to know as much as possible about and type of settlement in the target location prior interview. For this you should contact a knowledgeable person in the area (e.g. ward leader, lead farmers, focal point, etc.)

- Prepare a daily plan to conduct interview and have all needed material for it (enough questionnaires and some spare as well as pens and pencils, raincoat, umbrella, hat, drinking water, sweater, etc.) and how to carry it.
 - Think about appropriate time for conducting the interview in a given socio-cultural set up. Where there is no socio-cultural barrier, interview can be conducted between 08:30 and 16:00 hours. Ideally, interview with a single household should take not more than 60 minutes on average.
 - Understand and practice administering the questionnaire. A clear understanding questionnaire terminology helps you in conducting successful interview. Use the language best understood by the interviewee, and use easy-to-understand terminologies.
- **Some characteristics which you have to keep in mind over the whole survey**
 1. You should be open minded, interested into the livelihoods and farming/seed system of the target population as well as having some background knowledge on the area where you will work.
 2. To make your work more easy in the field, you have to remain polite, respectful, patience, devoted to the work (conditions are sometimes not easy) and be friendly to the surrounding population.
 3. With the received training and briefing, and the support of the supervisor you should be technically capable. At the same time you should be practical and result oriented and capable to make some decisions if needed.
 4. It is your responsibility to find a way to open the door towards successful interview with the respondents. This needs some Socio-cultural sensitivity, modesty and openness. As mentioned earlier, patience pays, especially where the respondent is not cooperating easily or not behaving properly. To facilitate this you should clearly explain the purpose of study and assure them that information collected will be only used by the organization (FAO, NGO etc.) for the programming purpose.
 5. In case the respondent is not willing to be interviewed, don't put unnecessary pressure on him. Give him the thanks and leave the place. Thereafter you have to look for the replacement but also inform your supervisor as soon as possible.
 6. At the same time you have to speak a language which is at the level of the beneficiaries. Please try to conduct interview in their mother tongue or convenient language which they understand easily.
- **Conduction of interview**
 - Your visit to a household should start with a short introduction and explain about the purpose of the visit. See the example of an introduction:
 "Good morning! My name is (If necessary show your identity card).
 I am a data collector (enumerator) for (Name the organization e.g. FAO) and we are conducting this survey in collaboration with (Name of implementing partner). You have been identified as a respondent from this location (village). I will ask some questions and we shall discuss issues relating to your households, faming and seed security, and any seed related assistance you got in the past few years. We would only make the best use of the information when it is accurate and precise. All the information we are asking is only related to your households, and will be only used by (Name the organization e.g. FAO, NRC, VSF) and relevant organisations and institutions. The information can be kept anonymous if requested.
 - Be polite and behave simply and modest to respondents.
 - If you think that response is not clear, repeat the question and try to clarify the answer.
 - Whilst taking interview, you might have to discuss on unrelated matters but you should always remember about your purpose and task.

- Ask question serially.
- While noting down the answer, if it is not correct and needs to be corrected the already highlighted option should be crossed and the correct option circled or written.
- Clearly write numbers such as 1 and 7, 4 and 9. This is where most of the confusions are made during the data entry process. Keep in mind that different persons (supervisor, data entry staff, controller, etc.) will further use your questionnaire. Therefore, make it as clearly as possible, and remember it is also a feedback on the professionalism of your work.
- If the respondent does not understand the question, then try to clarify the question by asking the same question with different words or asking additional questions.
- Do not ask leading questions. Don't ask questions which leads only to a No or Yes answer, unless requested so in the questionnaire. For examples: "Is it true that you don't have enough seed in this area?" In this case it would be better to ask; "which the possible sources are of seed in this area it". In the first case he/she will answer with yes in the second case he will make a list of the different seed sources.
- Even if you know some answer, you should not ask questions being pre judicious. It is only the farmers to say the answer and you only probe where the answer is not clear or not convincing. Your job is to ask, probe and record.
- In some cases observations (looking around the homestead) allow you corroborate (cross check) the information received. For example if the respondent says the household has no livestock and you see some chickens and goats tied around, it would be a good ground to probe further.
- Even when you notice the respondent has given wrong information, don't let him know but find the way that he can still correct it. He has to feel like there was an involuntary mistake. In case he feels threaten or seen as a liar he will most probably terminate the interview sooner or later.
- You should behave neutral and with a neutral expression in your face. You should not show your agreement or disagreement to some of his answers.
- Listen carefully and pay attention to the answer, as the respondent may give a lot of information at the same time and you have to find the proper answer. Repeat the question if you didn't get the point clearly.
- The respondent may not answer some questions. In such case you have to put assistance questions to clear the respondent or skip the question if he doesn't want to give the answer. Never write an answer in this case; what you think would be the correct one, better an empty space than a wrong information.
- If quantitative information is requested, please write down exactly the NUMBER and UNITS which the respondent has given to you, the conversions into standard units will be done during the data entry process or the enumerators at the end of the day.
- Write all information provided during interview including name of enumerators, location, district, etc. Before concluding the interview, check whether all the questions are filled and whether you have clarified some issues.
- **Review of filled questionnaire at the end interview**
After accomplishment of the interview, spare some 5-10 minutes to quickly go through the entire questionnaire. Consider checking the following points:
 - Whether all the questions are filled, and answers are readable and clear
 - Are there questions left behind for filling or need clarification? – sought clarification immediately before you leave the household.
 - Is there any mistake whilst having quick view? If you found inconsistencies, correct it immediately, as far as possible. Do this only if you can still remember the answers.
- **Submission of the day's questionnaire to the Supervisor for quality control**

After the day's work, all questionnaires filled the enumerator is submitted to the supervisor for quality control. Review of the questionnaire by the questionnaire by the supervisor in the presence of the enumerator.

- The supervisors should check the questionnaire thoroughly.
- The supervisor should cross check the questionnaire by being present during some of the interviews conducted by each of the enumerators he supervises.
- The cross-check will be done by supervisor by comparing filled questionnaire and the answers given by the respondent.
- Enumerator should check the questionnaire and make corrections, before submitting to the implementing partner or FAO as agreed beforehand.
- While noting down the answer, if it is not correct and needs to be cancelled the selected option then the enumerator should cross four times the wrong option - which is to be cancelled, and clearly circle the new correct one.
- Clearly write numbers such as 1 and 7 , 4 and 9.
- Everybody should think that the data will be further used and there are further means to verify the data correctness during the further processing.
- The supervisor should make sure that conversions of all local units to standard units are known.

ANNEX 5: CODIFICATIONS FOR DATA ENTRY (EXAMPLE FROM UGANDA)

Codes used for data entry for the emergency agricultural input distributions season 2004

List of Implementing Partners

1 = ACF	2 = AVSI	3 = CARE	4 = Church of Uganda
5 = CESVI	6 = GOAL	7 = Hunger Alert	
8 = Oxfam	9 = URCS	10 = WFP	
11 = World Vision			

List of Districts

1 = Apac	2 = Gulu	3 = Kaberamaido	4 = Katakwi
5 = Kitgum	6 = Kumi	7 = Lira	8 = Pader
9 = Soroti			

List of Subcounties

1 = Katine	2 = Tubur	3 = Arapai	4 = Anyara
5 = Otuboi	6 = Kalaki	7 = Alwa	8 = Pajule
9 = Pader TC	10 = Lapul	11 = Bobi	12 = Paicho
13 = Ongako	14 = Bungatira	15 = Koro	16 = Gulu Municipality
17 = Laroo	18 = Unyama	19 = Pabbo	20 = Barr
21 = Aler	22 = Bala stock farm		

List of Household Types

1 = resident	2 = returnee	3 = IDP
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Yes / No questions

0 = NO	1 = YES
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Distance to place of origin

1 = less or equal 5 km	2 = between 5 km and 15 km	3 = more or equal 15 km
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List of type of head of household

1 = normal	2 = women headed	3 = child headed	4 = disabled headed HH	5
= social cases	6 = better of HH	7 = HIV affected HH	8 = widow / widower	

List of main source of income

1 = agriculture	2 = livestock	3 = daily labour	4 = trading & shop keepers
5 = employed (salaries)	6 = remittances	7 = artisans	8 = fishing
9 = social support			

List of crops

1 = maize	2 = sorghum	3 = millet	4 = finger-millet
5 = beans	6 = groundnuts	7 = greengram (bambara beans)	8 = cowpeas
9 = simsim	10 = cotton	11 = tobacco	12 = sweet potatoes
13 = cassava	14 = rice	15 = sunflower	16 = pigeon peas
17 = sugarcane	18 = Soya bean		

List of source of seeds

1 = own production	2 = market	3 = gift from family, friends or neighbours	4 = FAO kit	5
= donation other NGO / govt.				

Time-schedule of training

1 = before distribution 2 = after distribution 3 = along the cropping period

Sowing pattern

0 = in lines 1 = broadcasted

Crop stand

0 = pure stand 1 = mixed stand

Ranking of germination rates or resistances

1 = bad 2 = low 3 = good 4 = excellent

ANNEX 6: CONVERSION FACTORS (EXAMPLE FROM UGANDA)

Conversion factors used in Uganda

Prices of harvested crops (in Ugandan shillings)

Maize	260 per kg
Groundnuts	1 500 per kg
Beans	550 per kg
Simsim	1 400 per kg
Millet	500 per kg
Sorghum	300 per kg
Cassava	6 000 per basin

Conversion factors for seeds

Cassava	one bag = 90 sticks	one acre = 600-800 sticks
sweet potatoes	one bundle = 120 heaps	one acre = 2 000 heaps
Sunflower	one basin = 13 kg	three basins = one bag = 39 kg
Maize	one basin = 20 kg	three basins = one bag = 60 kg
Sorghum	one basin = 16 kg	three basins = one bag = 50 kg
Millet	one basin = 16 kg	three basins = one bag = 50 kg
Groundnuts	one basin = 18 kg	three basins = one bag = 54 kg

Conversion factors for livestock

one chicken = one duck = ten pigeons
one goat = one sheep
one pig = two goats/sheep
one cattle = five pigs = ten goats/sheep

Conversion factors for land

1 hectare = 10 000 m² = 2.47 acres
1 acre = 0.41 hectares = 4 100 m²
1 m² = 10.76 square feet = 0.00024 acres
1 square foot = 0.09 m²

ANNEXES 7: SSA TOOLS

Annex 7.1: Household Survey (HHS) questionnaire

FAO Standard
Seed Security Assessment : Household Survey (HHS)

Note

- Text highlighted in YELLOW to be modified or replaced after adapting the questionnaire to local context. Amend Excel Spreadsheet as well.
- Text in blue are notes to the enumerators
- Figures in bracket () or = are codes for data entry

Example introduction: Thanks for agreeing to this interview. We are XX and YY. We work for the United Nations' FAO / Other. We want to understand how your seed system works. The answers we get will be shared with organizations working on seed for any improvement required for their action.

Questionnaire number.→		Data entry number→	
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Section 1: Details

- 1.1 Name of Enumerator: _____
- 1.2 Organization: _____
- 1.3 Date of assessment: _____
- Location** (to be modified based on the country's administrative units -biggest to lowest e.g. Kenya below)
- 1.4 Province: _____
- 1.5 County: _____
- 1.6 Sub-county: _____
- 1.7 Village: _____
- 1.8 Agro-ecological zone: _____

Codes: (to be added, as country specific)

Province:

County:

Sub-county:

Agro-ecological zone:

Section 2: Respondent Information

- 2.1 Name of respondent: _____ (not to be entered into database)
- 2.2 Age: _____ (years)
- 2.3 Gender (Sex): ☐ Male (1) ☐ Female (0)
- 2.4 Relationship: ☐ Household head (1) ☐ Spouse (2) ☐ Son/daughter (3) ☐ Other living in HH (4)
- 2.5 Education: ☐ No formal (1) ☐ Primary school (2) ☐ Secondary (3) ☐ Tertiary (4)
- 2.6 Mobile #: _____ (not to be entered into database)

Section 3: Household Demographic and Livelihood Characteristics

3.1 Gender Head of household (HH).

☐ Male (1)

☐ Female (0)

3.2 Residential status of the household (HH). **To be revised or omitted if there is no distinct category**

☐ Resident (1)

☐ Returnee (2)*

☐ Refugee (3)*

☐

IDP (4)*

3.3 For how long have you continually lived in this area? _____ Years **(Only for those with a * above)**

3.5 Household size: How many people live in this household? _____ Note to enumerator; Give the number under each age groups below?

Age group→	< 5 years	5-17 years	18-35 years	36-60 years	>60 years

3.6 How many household members are involved in Agricultural activities? _____

3.7a. Do you rear livestock?

☐ Yes (1)

☐ No (0)

3.7b. If yes which type of livestock do you keep? And how many do you have? **(Add or remove animals where applicable)**

Type	Number	Type	Number
<input type="checkbox"/> Cattle	<input type="checkbox"/> Sheep	.....
<input type="checkbox"/> Donkey	<input type="checkbox"/> Poultry	.....
<input type="checkbox"/> Goat	<input type="checkbox"/> Camel	.....
<input type="checkbox"/> Pigs		
Others – please specify the type and numbers below			
<input type="checkbox"/> 1).....	<input type="checkbox"/>
		2).....	

3.8 What were your **Main** sources of income last season? **(Add or omit options below and revise corresponding codes)**

Income source	Income source	Income source
<input type="checkbox"/> Crop produce (1)	<input type="checkbox"/> Livestock sale (2)	<input type="checkbox"/> Fishing (3)
<input type="checkbox"/> On-farm daily labor (4)	<input type="checkbox"/> Livestock products (5)	<input type="checkbox"/> Hunting & gathering (6)
<input type="checkbox"/> Non on-farm daily labor (7)	<input type="checkbox"/> Remittances (8)	<input type="checkbox"/> Petty trade (9)
<input type="checkbox"/> Sale of charcoal/fuel wood (10)	<input type="checkbox"/> Salary (11)	<input type="checkbox"/> Pension (12)
<input type="checkbox"/> Others (specify).....		

3.9a. Are you able to save some cash from the income you earned?

☐ Yes (1)

☐ No (0)

3.9b. Are you able to access credit from any source?

☐ Yes (1)

☐ No (0)

Section 4: Food Availability and Access at Household Level

4.1 For how many days (0-7) of the last 7 days have you eaten the following food groups?

Food group	Days (0-7)	Food group	Days (0-7)
1. Cereals	6. Milk/ milk products	.....

2. Roots and tuber 7. Fruits
3. Pulses / legumes 8. Sugar / sweet
4. Vegetables 9. Oil / ghee / fat
5. Meat / fish / eggs

Section 5: Crop Production/ Seed System Profile

5.1 What crops did you plant last season? (Retain/add/remove crop(s) based on most likely one to be found in the target areas. Modify the codes as well)

Cereals	<input type="checkbox"/> Sorghum =1	<input type="checkbox"/> Maize=2	<input type="checkbox"/> Rice=3	
	<input type="checkbox"/> Finger millet =4	<input type="checkbox"/> bulrush (pearl) millet =5	<input type="checkbox"/> Wheat=6	<input type="checkbox"/> Teff = 7
Oilseed	<input type="checkbox"/> Groundnut=8	<input type="checkbox"/> Sesame=9	<input type="checkbox"/> Sunflower =10	
Pulses	<input type="checkbox"/> Beans=11	<input type="checkbox"/> Cowpea=12	<input type="checkbox"/> Green grams =13	
	<input type="checkbox"/> French beans = 14	<input type="checkbox"/> Pigeon peas = 15	<input type="checkbox"/> Soya = 16	<input type="checkbox"/> Dolicos = 17
RTB	<input type="checkbox"/> Cassava=18	<input type="checkbox"/> Sweet potato=19	<input type="checkbox"/> Potato=20	
	<input type="checkbox"/> Cocoyam = 21	<input type="checkbox"/> Yams = 22	<input type="checkbox"/> Banana =23	
Vegetables	<input type="checkbox"/> Local	<input type="checkbox"/> exotic		

5.2. Should be asked only if the household indicated that they planted vegetable:

5.2a for what Main purpose do you cultivate vegetables?

☐ Domestic (1) ☐ Commercial (0)

5.2b. If commercial, who decides on how the money is used?

☐ Men (1) ☐ Women (2) ☐ Both (3)

5.3 Of the above crops, which were the three most important you cultivated last season? (Last season to be customized by months and year)?

Crop production parameters (investigate crop by crop – A, B & C)	Crop A	Crop B	Crop C
a) Name (or code) of the three most important crops (see codes in 5.1) Eg.	1	5	11
b) What is the Main use of the crop? 1= food; 2= income; 3=fodder			
c) What area (acre) did you plant during the last season? (area unit (acre) can be customized)	2.5	3.0	6
d) Land preparation method: 1= Slash and burnt; 2= Zero/minimum tillage; 3=use of hand tools; 4=Animal traction; 5= Tractor			
e) Quantity of seed used (kg) (convert the local unit used by the farmer into kg) (except for cassava, sweet potato, potato, yams, cocoyam and banana)	10	8	120
f) Was the crop in the field 1=rain-fed or 0= irrigated?			
g) What was the cropping practice? 1=mixed crop; 0=sole crop			
h) Did you apply inorganic fertilizer? 1=Yes, 0=No			
i) Did you use organic fertilizer? 1=Yes, 0=No			
j) If yes, what type of manure? 1=compost; 2= animal; 3=others (specify).....			
k) Quantity harvested (kg) (convert the local unit used by the farmer into kg) (except for cassava, sweet potato, potato, yams, cocoyam and banana)			
l) How do you rate the harvest? 1=Excellent; 2=Good; 3=Fair; 4=Poor			
Crop code: Crop codes in 5.1 could be added here.			

5.4 Of the above (mentioned) crops, which ones will you plant during this upcoming season? (Upcoming season to be customized by months and year)?

Crop production parameters (investigate crop by crop – A, B & C)	Crop A	Crop B	Crop C
a) Name (or code) of the three most important crops (maintain the order as in 5.3)	1	7	10
b) What is the area (acre) planted or expected to be planted? E.g.	2.5	3.0	8.5
c) Quantity of seed expected to be planted (kg)? (convert the local unit into kg)	10	4	100
d) Change in Main crop (s): 1=Yes 0=No (observe this from the responses) e.g.	0	1	0
e) Main reason for change in main crops if any (see codes below)			
f) Change in area to be planted: 1= Yes; 2=No, 3=Not applicable (observe this from the responses)	2	3	1
g) Main reason for change of area if yes (see codes below)			
h) Change seed quantity be used: 1= Yes; 2=No, 3=Not applicable (observe this from the responses)	2	3	1
i) Main reason for change in quantity of seed (see codes below)			
Codes for Main reason for change (Note to the enumerators: only one to be identified)			
1 = Lack of land; 2 = Access to more land; 3 = Lack of labor force; 4 = Access to more labor force; 5=Lack of seed; 6=Better access to seeds;	7=Free seed; 8=Increase in seed prices; 9=Decrease in seed prices; 10=Decrease of produce price; 11=Guaranteed selling price of produce; 12=Secure market;	13=Increased need at household level 14 = Lack of tools and equipment 15= Replanting of seed 16=Others (specify).....	

Section 6: Important Crops and their Seed Sources

Transfer important crops (A, B & C) from 5.3 to 6.1, 6.2 and 6.3 of this section

6.1 What was/were your source(s) of seed for the important **CROP A**? In the last season (Last season to be customized by months and year) (Code or name)

☐ Own seed ☐ Local Market ☐ Soc. Network ☐ Agro-input-Dealer ☐ Seed aid

Note to enumerator: Multiple responses possible

6.1.1 Assess varietal suitability, availability, accessibility and quality of crop **A** seed from the source(s) indicated above.

Crop A (.....) Last Season	Source(s) of seed LAST SEASON				
	Own	Local market	Social Network	Agro-input dealer	Seed aid ⁽¹⁾
a) Name of the Major variety					
b) Variety type: 1= local; 0=improved					
c) Was there enough seed from this source? 1=Yes; 0=No					
d) What quantity of seed (kg) did you plant from this source?					
e) At what time was the seed available? 1=Before the planting season; 2= at start of the season; 3=mid-season; 4= towards the end of season					
f) Where did you collect the seed from? 1= in this village; 2=neighboring district; 3= far away district.					
g) How did you acquire the seed? 1= Cash; 2= On credit; 3= bartered; 4=free (gift)					
h) How was the price or term of trade? 1= affordable; 2= expensive ; 3=very expensive (ask only those who acquired by cash, on credit or bartered only)					
i) Was the seed clean? 1= clean (no impurities, no damage); 2= fairly clean (some impurities, no damage); 3=not clean (Some impurities & damage) Note to enumerator: Damage refers to physical, pest infestation or both					
j) How was the germination of the seed? 1= Good, 2=Fair; 3=Poor					
(1) Seed Aid: Please indicate name of organization who provided seed aid e.g. FAO, Action Aid, Concern etc.					

6.1.2 Overall, if you consider the following seed sources; own, local market, social network and agro-input dealers, was there enough seed available for **crop A** during last season? (Last season to be customized by months and year) ☐ Yes (1) ☐ No (0)

6.1.3. In the **UPCOMING (NEXT) OR THIS SEASON**, where will (have) you source seed of **CROP A** (.....) from? (Upcoming or this season to be customized by months and year)

☐ Own seed ☐ Local Market ☐ Soc. Network ☐ Agro-input-Dealer ☐ Seed aid

Note to enumerator: Multiple responses possible

6.1.4 Assess availability and accessibility of crop **A** seed from this/these source(s). Assess variety type, growth, liking by the farmer only if the variety was not planted last season

Crop A (.....) NEXT SEASON	Source(s) of seed LAST SEASON				
	Own	Local market	Social Network	Agro-vet	Seed aid ⁽¹⁾
a) Name of the Major variety					

b) Variety same as last season? 1= Yes; 0=No					
c) If No, Main reason for change of variety (see codes below)					
d) Variety type: 1= local; 0=improved					
e) Is there enough seed from this source? 1=Yes; 0=No					
f) What quantity of seed (kg) did/will you plant from this source?					
g) Change in the quantity of seed from this source? 1=Yes; 0=No					
h) Reason for change in the quantity of seed (see code below)					
i) At what time did/will the seed be available? 1=Before the planting season; 2= at start of the season; 3=mid-season; 4= towards the end of season					
j) Where did/will you collect the seed from? 1= in this village; 2= neighboring district; 3= far away district.					
k) How did/will you acquire the seed? 1= Cash; 2= On credit; 3= bartered; 4=free (gift)					
l) How is the current price or term of trade for seed? 1= affordable; 2= high; 3=very high (ask only those who did/will acquire seed by cash, on credit or bartered only)					
Seed Aid: Please indicate name of organization who provided seed aid e.g. FAO, Action Aid, Concern etc.					
Codes for Main reason for change of seed quantity if any					
1 = Lack of seed from same source; 2 = More seeds available from this source; 3 = Lack of resistance to pest; 4 = Good resistance to pests; 5= Good performance of seeds; 6= Bad performance of seeds;	7=Received free seed; 8=Increase in seed prices; 9=Decrease in seed prices; 10= Lack of resistance to diseases; 11=Good resistance to diseases; 12= Lost seeds during storage	13= (specify).....	Others,		

6.1.5 Overall, if you consider the following seed sources; own production, local market, social network and agro-input dealers, will there be enough seed available for **crop A** during in the upcoming or this season?

(Upcoming/this season to be customized by months and year) ☐ Yes (1) ☐ No (0)

6.1.6 From which market did/will you buy your seed from? Note to the enumerators: (To be asked to those who indicated 'market')

Market 1: _____ Market 2: _____

6.2 What was/were your source(s) of seed for the important **CROP B?** In the lasts season (Last season to be customized by months and year) (Code or name)

☐ Own seed ☐ Local Market ☐ Soc. Network ☐ Agro-input-Dealer ☐ Seed aid

Note to enumerator: Multiple responses possible

6.2.1 Assess varietal suitability, availability, accessibility and quality of crop **B** seed from the source(s) indicated above.

Crop B (.....) Last Season	Source(s) of seed LAST SEASON				
	Own	Local market	Social Network	Agro-vet	Seed aid ⁽¹⁾
a) Name of the Major variety					
b) Variety type: 1= local; 0=improved					

c) Was there enough seed from this source? 1=Yes; 0=No					
d) What quantity of seed (kg) did you plant from this source?					
e) At what time was the seed available? 1=Before the planting season; 2= at start of the season; 3=mid-season; 4= towards the end of season					
f) Where did you collect the seed from? 1= in this village; 2=neighboring district; 3= far away district.					
g) How did you acquire the seed? 1= Cash; 2= On credit; 3= bartered; 4=free (gift)					
h) How was the price or term of trade? 1= affordable; 2= expensive ; 3=very expensive (ask only those who acquired by cash, on credit or bartered only)					
i) Was the seed clean? 1= clean (no impurities, no damage); 2= fairly clean (some impurities, no damage); 3=not clean (Some impurities & damage)					
j) Note to enumerator: Damage refers to physical, pest infestation or both					
k) How was the germination of the seed? 1= Good, 2=Fair; 3=Poor					
Seed Aid: Please indicate name of organization who provided seed aid e.g. FAO, Action Aid, Concern etc.					

6.2.2 Overall, if you consider the following seed sources; own production, local market, social network and agro-input dealers, was there enough seed available for **crop B** during last season? (Last season to be customized by months and year) ☐ Yes (1) ☐ No (0)

6.2.3. In the **UPCOMING (NEXT) OR THIS SEASON**, where will (have) you source seed of **CROP B** (.....) from? (Upcoming or this season to be customized by months and year)
☐ Own seed ☐ Local Market ☐ Soc. Network ☐ Agro-input-Dealer ☐
 Seed aid

Note to enumerator: Multiple responses possible

6.2.4 Assess availability and accessibility of crop **B** seed from this/these source(s). Assess variety type, growth, liking by the farmer only if the variety was not planted last season

Crop B (.....) NEXT SEASON	Source(s) of seed LAST SEASON				
	Own	Local market	Social Network	Agro-vet	Seed aid ⁽¹⁾
a) Name of the Major variety					
b) Variety same as last season? 1= Yes; 0=No					
c) If No, Main reason for change of variety (see codes below)					
d) Variety type: 1= local; 0=improved					
e) Is there enough seed from this source? 1=Yes; 0=No					
f) What quantity of seed (kg) did/will you plant from this source?					
g) Change in the quantity of seed from this source? 1=Yes; 0=No					
h) Reason for change in the quantity of seed (see code below)					

i) At what time did/will the seed be available? 1=Before the planting season; 2= at start of the season; 3=mid-season; 4= towards the end of season					
j) Where did/will you collect the seed from? 1= in this village; 2= neighboring district; 3= far away district.					
k) How did/will you acquire the seed? 1= Cash; 2= On credit; 3= bartered; 4=free (gift)					
l) How is the current price or term of trade for seed? 1= affordable; 2= high; 3=very high (ask only those who did/will acquire seed by cash, on credit or bartered only)					
Seed Aid: Please indicate name of organization who provided seed aid e.g. FAO, Action Aid, Concern etc.					
Codes for Main reason for change of seed quantity if any					
1 = Lack of seed from same source; 2 = More seeds available from this source; 3 = Lack of resistance to pest; 4 = Good resistance to pests; 5= Good performance of seeds; 6= Bad performance of seeds;	7=Received free seed; 8=Increase in seed prices; 9=Decrease in seed prices; 10= Lack of resistance to diseases; 11=Good resistance to diseases; 12= Lost seeds during storage	13= Others, (specify).....			

6.2.5 Overall, if you consider the following seed sources; own production, local market, social network and agro-input dealers, will there be enough seed available for **crop B** during in the upcoming or this season?

(Upcoming/this season to be customized by months and year) ☐ Yes (1) ☐ No (0)

6.2.6 From which market did/will you buy your seed from? **Note to the enumerators: (To be asked to those who indicated 'market')**

Market 1: _____ Market 2: _____

6.3 What was/were your source(s) of seed for the important **CROP C?** In the lasts season (Last season to be customized by months and year) (Code or name)

☐ Own seed ☐ Local Market ☐ Soc. Network ☐ Agro-input-Dealer ☐ Seed aid

Note to enumerator: Multiple responses possible

6.3.1 Assess varietal suitability, availability, accessibility and quality of crop **C** seed from the source(s) indicated above.

Crop C (.....) Last Season	Source(s) of seed LAST SEASON				
	Own	Local market	Social Network	Agro-vet	Seed aid ⁽¹⁾
a) Name of the Major variety					
b) Variety type: 1= local; 0=improved					
c) Was there enough seed from this source? 1=Yes; 0=No					
d) What quantity of seed (kg) did you plant from this source?					
e) At what time was the seed available? 1=Before the planting season; 2= at start of the season; 3=mid-season; 4= towards the end of season					
f) Where did you collect the seed from? 1= in this village; 2=neighboring district; 3= far away district.					
g) How did you acquire the seed? 1= Cash; 2= On credit; 3= bartered; 4=free (gift)					
h) How was the price or term of trade? 1= affordable; 2= expensive ; 3=very expensive (ask only those who acquired by cash, on credit or bartered only)					

i) Was the seed clean? 1= clean (no impurities, no damage); 2= fairly clean (some impurities, no damage); 3=not clean (Some impurities & damage) Note to enumerator: Damage refers to physical, pest infestation or both					
j) How was the germination of the seed? 1= Good, 2=Fair; 3=Poor					
Seed Aid: Please indicate name of organization who provided seed aid e.g. FAO, Action Aid, Concern etc.					

6.3.2 Overall, if you consider all possible seed sources, was there enough seed available for **crop C** during last season? **(Last season to be customized by months and year)** ☐ Yes (1) ☐ No (0)

6.3.3. In the **UPCOMING (NEXT) OR THIS SEASON**, where will (have) you source seed of **CROP C** (.....) from? **(Upcoming or this season to be customized by months and year)**

☐ Own seed ☐ Local Market ☐ Soc. Network ☐ Agro-input-Dealer ☐

Seed aid

Note to enumerator: Multiple responses possible

6.3.4 Assess availability and accessibility of crop **B** seed from this/these source(s). **Assess variety type, growth, liking by the farmer only if the variety was not planted last season**

Crop C (.....) NEXT SEASON	Source(s) of seed LAST SEASON				
	Own	Local market	Social Network	Agro-vet	Seed aid ⁽¹⁾
a) Name of the Major variety					
b) Variety same as last season? 1= Yes; 0=No					
c) If No, Main reason for change of variety (see codes below)					
d) Variety type: 1= local; 0=improved					
e) Is there enough seed from this source? 1=Yes; 0=No					
f) What quantity of seed (kg) did/will you plant from this source?					
g) Change in the quantity of seed from this source? 1=Yes; 0=No					
h) Reason for change in the quantity of seed (see code below)					
i) At what time did/will the seed be available? 1=Before the planting season; 2= at start of the season; 3=mid-season; 4= towards the end of season					
j) Where did/will you collect the seed from? 1= in this village; 2= neighboring district; 3= far away district.					
k) How did/will you acquire the seed? 1= Cash; 2= On credit; 3= bartered; 4=free (gift)					
l) How is the current price or term of trade for seed? 1= affordable; 2= high; 3=very high (ask only those who did/will acquire seed by cash, on credit or bartered only)					
Seed Aid: Please indicate name of organization who provided seed aid e.g. FAO, Action Aid, Concern etc.					
Codes for Main reason for change of seed quantity if any					
1 = Lack of seed from same source; 2 = More seeds available from this source; 3 = Lack of resistance to pest; 4 = Good resistance to pests;		7=Received free seed; 8=Increase in seed prices; 9=Decrease in seed prices; 10= Lack of resistance to diseases; 11=Good resistance to diseases;		13= Others, (specify).....	

5= Good performance of seeds; 6= Bad performance of seeds;	12= Lost seeds during storage	
---------------------------------------------------------------	-------------------------------	--

6.3.5 Overall, if you consider all possible seed sources, will there be enough seed available for **crop C** during in the upcoming or this season? (Upcoming/this season to be customized by months and year) ☐ Yes (1)

☐ No (0)

6.3.6 From which market did/will you buy your seed from? Note to the enumerators: (To be asked to those who indicated 'market')

Market 1: _____

Market 2: _____

Section 7: Seed Aid (AAP)

Note to the enumerators: All those who indicated seed aid as their source of seed (Section 6) already have information for last and current season- Just transfer the information from section 6. Others who have not indicated seed aid as source of seed in section 6 could still provide information on seed aid in the previous years (below the current year).

7.1 Have you ever received seed aid in the last five years? ☐ Yes (1) ☐ No (0)

7.2a If yes, how many times have you received seed aid in the last five years? _____

7.2b How did you access the seeds? (Multiple choice possible; code: Yes = (1) / No = (0))

☐ Direct distribution

☐ Seed fairs and voucher;

☐ Voucher

☐ Others (specify) _____

7.2c. On which terms have you been given the seed aid? (Multiple choice possible; code: Yes =(1) / No = (0))

☐ Free

☐ Cost sharing

☐ Seed Recovery

☐ Others (specify) _____

7.2d. Which organization provided the seed (mention the organizations / institutions names)?

1: _____ 2: _____ 3: _____

4: _____ 5: _____

7.3 Did you ever participate in identifying the crop and variety given to you?

☐ No, I never participated (1); ☐ Yes, but did not get what we asked for (2); ☐ Yes, and given my choice (3)

7.4 Did you ever receive a variety totally new to you? ☐ Yes (1) ☐ No (0)

7.6 Were you provided information you needed on the variety? ☐ Yes (1) ☐ No (0)

7.7. Overall, what is your level of satisfaction with the seeds you were provided?
☐ Very satisfied =1; ☐ Satisfied (2); ☐ Not satisfied (3); ☐ Very unsatisfied (4)

Thanks for all the information you have provided

Annex 7.2: Local Market Survey (LMS) Questionnaire

FAO Standard
Seed Security Assessment: Local Market Survey (LMS)

Note

- Text highlighted in YELLOW to be modified or replaced after adapting the questionnaire to local context. Amend Excel Spreadsheet for data entry as well.
- Text in BLUE are notes to the enumerators
- Figures in brackets are codes for data entry

We are **XX** and **YY**. We work for the **United Nations' FAO/Other**. We want to understand how seed system works in this area. A number of farmers have indicated to us that they buy their seed from traders such as you.

PRELIMINARY QUESTION: Do famers buy some of your grains for planting?

☐ Yes

☐ No

If NO, this trader should NOT be interviewed

If yes, request if you could proceed interviewing him/her on only those seed/grain that farmers buy for planting.

Thanks for agreeing to this interview. The responses will be shared with organizations working on seed for any improvement requires of their action.

Questionnaire number.→			Data entry number→	
------------------------	--	--	--------------------	--

Objectives:

- To identify varieties of crops being sold as seed
- To determine availability, access and quality of grains being used as seed.
- To understand the demand of grains that can be used as seed by farmers.

Section 1: Details location

1.2 Name of Enumerator: _____

1.3 Organization _____

1.4 Date: _____

Location (to be modified based on the country's administrative units -biggest to lowest e.g. Kenya below)

1.5 Province: _____

1.6 County: _____

1.7 Sub-county: _____

1.8 Ward: _____

1.9 Village: _____

1.10 Name of the market _____

Section 2: Seed Trader Information

2.1 Name of farmer: _____

2.2 Age: _____

- 2.3 Gender (Sex): ☐ Male (1) ☐ Female (0)
- 2.4 Education ☐ No formal (1) ☐ Primary school (2) ☐ Secondary (3) ☐ Tertiary (4)
- 2.5 Mobile #: _____
- 2.6 For how many years have you been in the seed business? _____
- 2.7 Are you full time in your business? ☐ Yes (1) ☐ No (0)

1.0 Seed Business Information

1.1 What type of crop seed do you sell? Tick (codes: Yes = 1, No = 0)

Add or remove crop(s) based on most likely one to be found in local market and adjust the codes as well)

Cereals	<input type="checkbox"/> Sorghum =1	<input type="checkbox"/> Maize=2	<input type="checkbox"/> Rice=3	
	<input type="checkbox"/> Finger millet =4	<input type="checkbox"/> bulrush (pearl) millet =5	<input type="checkbox"/> Wheat=6	<input type="checkbox"/> Teff = 7
Oilseed	<input type="checkbox"/> Groundnut=8	<input type="checkbox"/> Sesame=9	<input type="checkbox"/> Sunflower =10	
Pulses	<input type="checkbox"/> Beans=11	<input type="checkbox"/> Cowpea=12	<input type="checkbox"/> Green grams =13	
	<input type="checkbox"/> French beans = 14	<input type="checkbox"/> Pigeon peas = 15	<input type="checkbox"/> Soya = 16	<input type="checkbox"/> Dolicos = 17
RTB	<input type="checkbox"/> Cassava=18	<input type="checkbox"/> Sweet potato=19	<input type="checkbox"/> Potato=20	
	<input type="checkbox"/> Cocoyam = 21	<input type="checkbox"/> Yams = 22	<input type="checkbox"/> Banana =23	
Vegetables	<input type="checkbox"/> Local	<input type="checkbox"/> exotic		

1.2 Do you sometimes sell your seeds outside this market? ☐ Yes (1) ☐ No (0)

1.3 If Yes, to which location(s) and how far is this location from here?

Name of the Location	How far? (code below)	Name of the Location	How far? (code below)
1.....	1.....	.....
2.	2. ....	.....

How far?: 1= Within the sub-county; 2=Within the county; 3= Neighboring County; 4=far away County; 5= outside the county (These have to revised based on the country's administrative zoning)
(Note to the enumerators: Multiple responses possible)

2.0 Seed Transportation and Storage

2.1 Which mean(s) of transport do you use for transporting your seed to the markets? (add or remove transport means, and adjust the codes)

Tick	Tick	Tick
<input type="checkbox"/> Motor vehicle (1)	<input type="checkbox"/> Donkey (5)	<input type="checkbox"/>
<input type="checkbox"/> Motorcycle (2)	<input type="checkbox"/> Manpower (on head) (6)	<input type="checkbox"/>
<input type="checkbox"/> Bicycle (3)	<input type="checkbox"/> Motor boat (7)	<input type="checkbox"/>
<input type="checkbox"/> Animal drawn cart (4)	<input type="checkbox"/> Train (8)	<input type="checkbox"/>
<input type="checkbox"/> Brought by the trader (9)	<input type="checkbox"/> Brought by the farmers (10)	<input type="checkbox"/>

Note to the enumerators: Multiple responses possible

2.2 Where do you store your seed?

Storage place Comment on what you have seen only

☐ Within the market (1)

☐ Granary (2)

☐ Store (3)

☐ Silos (4)

☐ Wooden cribs (5)

Others (specify)

Note to the enumerators: Multiple responses possible for where

2.3 In what type of bag or container do you keep your seeds?

Containers

☐ Jute bags (1)

☐ Plastic containers (4)

Others

(specify)

Containers

☐ Sisal bags (2)

☐ Metal containers (5)

☐

☐ Polythene bags (3)

☐

☐

Note to the enumerators: Multiple responses possible

2.4 Where are the seed bags or containers placed during storage?

☐ On mud floor (1)

☐ On wooden shelves (4)

☐

☐ On cemented floor (2)

☐ On concrete shelves (5)

☐

☐ On pellets (3)

☐

☐

3.0 Seed Supply and Demand

3.1 Which crops and varieties do farmers buy for planting and in what average quantity?

Crop	Variety 1	Variety 2	Variety 3	Average crop quantity sold (kg) per famer
A.....
...
B.....
....
C.....
...
D.....
...
E.....
....

F.....
... ..
... ..

(Note to the enumerators: A Seed trader may have just one crop/variety or more)

3.2 Do you sometimes provide credit to farmers who want seed during planting season?

☐ Yes (1)

☐ No (0)

3.2a If yes, which proportion of your costumers are buying on credit?%

(You can ask, out of the last 20 customers who got seed from you, how many got on credit?)

3.3 Do you sometimes exchange seed with other goods from the farmers during planting time?

☐ Yes (1)

☐ No (0)

Extras of this page can be carried separately

3.4 Crop (name) _____ Variety (name) _____

a) Is this a local or improved variety? (no need to ask if the enumerator knows the variety)

☐ Local (1)

☐ Improved (0)

b) Does the variety grow well in this area?

☐ Yes (1)

☐ No (0)

c) Who supplied you with this variety? (multiple response possible)

☐ Individual farmers (1) ☐ Farmers group (2) ☐ Seed growers group (3) ☐ Trader (4) ☐ Seed Company (5) ☐ Agro-I-dealers (6) ☐ got as relief (7) Others (specify) _____

d) Where did you source the current seed from? (These have to be revised based on the country's administrative zoning)

☐ Within the Sub-county (1) ☐ Within the County (2) ☐ Neighboring County (3) ☐ Far away County (4) ☐ Another Country (5)

e) What is the current price of this variety? _____ (Shillings)
per Kg

f) What was the price of this variety at planting time? _____ (Shillings)
per Kg

g) What was the price one month before planting time? _____ (Shillings)
per Kg

h) What quantity of this variety do you have NOW in stock?

_____ Kg OR _____ Bags ofkg each (can change accordingly)

i) What quantity did you sell LAST MONTH as seed?

_____ Kg OR _____ Bags ofkg each (can change accordingly)

j) What quantity do you normally sell during the planting season as seed?

_____ Kg OR _____ Bags ofkg each (can change accordingly)

k) Which month(s) do you sell more of this variety as seed?

Sales	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec
High	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Code for data entry: Yes = 1, No = 0

l) Physical cleanliness of the current stock?

☐ Clean (1) ☐ Fairly clean (2) ☐ Not clean (3) ☐ Can't tell as

there is no stock (4)

Physical cleanliness: =1=Clean (no impurities, no damage); 2= fairly clean (some impurities but no damage); 3=not clean (with some impurities and some damage) – damage refers to physical damage, pest damage or both.

3.4 Crop (name)_____ Variety (name)_____

a) Is this a local or improved variety? **(no need to ask if the enumerator knows the variety)**

☐ Local (1)

☐ Improved (0)

b) Does the variety grow well in this area?

☐ Yes (1)

☐ No (0)

c) Who supplied you with this variety? **(multiple response possible)**

☐ Individual farmers (1) ☐ Farmers group (2) ☐ Seed growers group (3) ☐ Trader (4) ☐ Seed Company (5) ☐ Agro-I-dealers (6) ☐ got as relief (7) Others (specify)_____

d) Where did you source the current seed from? **(These have to be revised based on the country's administrative zoning)**

☐ Within the Sub-county (1) ☐ Within the County (2) ☐ Neighboring County (3) ☐ Far away County (4) ☐ Another Country (5)

e) What is the current price of this variety? _____(Shillings)
per Kg

f) What was the price of this variety at planting time? _____(Shillings)
per Kg

g) What was the price one month before planting time? _____(Shillings)
per Kg

h) What quantity of this variety do you have NOW in stock?
_____Kg OR _____Bags ofkg each **(can change accordingly)**

i) What quantity did you sell LAST MONTH as seed?
_____Kg OR _____Bags ofkg each **(can change accordingly)**

j) What quantity do you normally sell during the planting season as seed?
_____Kg OR _____Bags ofkg each **(can change accordingly)**

k) Which month(s) do you sell more of this variety as seed?

Sales	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec
High	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Code for data entry: Yes = 1, No = 0

l) Physical cleanliness of the current stock?

☐ Clean (1)

☐ Fairly clean (2)

☐ Not clean (3)

☐ Can't tell as

there is no stock (4)

Physical cleanliness: =1=Clean (no impurities, no damage); 2= fairly clean (some impurities but no damage); 3=not clean (with some impurities and some damage) – damage refers to physical damage, pest damage or both.

3.4 Crop (name)_____ Variety (name)_____

a) Is this a local or improved variety? **(no need to ask if the enumerator knows the variety)**

☐ Local (1)

☐ Improved (0)

b) Does the variety grow well in this area?

☐ Yes (1)

☐ No (0)

c) Who supplied you with this variety? **(multiple response possible)**

☐ Individual farmers (1)

☐ Farmers group (2)

☐ Seed growers

group (3)

☐ Trader (4)

☐ Seed Company

(5)

☐ Agro-I-dealers (6)

☐ got as relief (7)

Others (specify)_____

d) Where did you source the current seed from? **(These have to be revised based on the country's administrative zoning)**

☐ Within the Sub-county (1)

☐ Within the County (2)

☐

Neighboring County (3)

☐ Far away County (4)

☐

Another

Country (5)

e) What is the current price of this variety?

_____ (Shillings)

per Kg

f) What was the price of this variety at planting time?

_____ (Shillings)

per Kg

g) What was the price one month before planting time?

_____ (Shillings)

per Kg

h) What quantity of this variety do you have NOW in stock?

_____ Kg OR _____ Bags ofkg each **(can change accordingly)**

i) What quantity did you sell LAST MONTH as seed?

_____ Kg OR _____ Bags ofkg each **(can change accordingly)**

j) What quantity do you normally sell during the planting season as seed?

_____ Kg OR _____ Bags ofkg each **(can change accordingly)**

k) Which month(s) do you sell more of this variety as seed?

Sales	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec
High	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Code for data entry: Yes = 1, No = 0

l) Physical cleanliness of the current stock?

☐ Clean (1)

☐ Fairly clean (2)

☐ Not clean (3)

☐ Can't tell as

there is no stock (4)

Physical cleanliness: =1=Clean (no impurities, no damage); 2= fairly clean (some impurities but no damage); 3=not clean (with some impurities and some damage) – damage refers to physical damage, pest damage or both.

4.0 Grain/seed conditioning

4.1 What are the most important activities you undertake to improve the commercial value of your seed of crop?

Crop A (Name) _____

Activities (For data entry: Yes = 1 / No = 0)	Observation	General Comment
<input type="checkbox"/> Clean out impurities – dust, debris and stones	
<input type="checkbox"/> Sort out broken, shriveled and discolored grains/seed	
<input type="checkbox"/> Sort according to varieties	
<input type="checkbox"/> Grade according to grain/seed size	
<input type="checkbox"/> Package according to popular demand	
<input type="checkbox"/> Display fresh and old product separately	
<input type="checkbox"/> Sell grain and seed separately	
Others (specify).....	

Observation code: 1=true; 2= false; 3= can't confirm **(Note to the enumerators: the observation is to be made by the interviewer on what s/he sees on display; multiple responses possible)**

Crop B (Name) _____

Activities (For data entry: Yes = 1 / No = 0)	Observation	General Comment
<input type="checkbox"/> Clean out impurities – dust, debris and stones	
<input type="checkbox"/> Sort out broken, shriveled and discolored grains/seed	
<input type="checkbox"/> Sort according to varieties	
<input type="checkbox"/> Grade according to grain/seed size	
<input type="checkbox"/> Package according to popular demand	
<input type="checkbox"/> Display fresh and old product separately	
<input type="checkbox"/> Sell grain and seed separately	
Others (specify).....	

Observation code: 1=true; 2= false; 3= can't confirm **(Note to the enumerators: the observation is to be made by the interviewer on what s/he sees on display; multiple responses possible)**

Crop C (Name) _____

Activities (For data entry: Yes = 1 / No = 0)	Observation	General Comment
<input type="checkbox"/> Clean out impurities – dust, debris and stones	
<input type="checkbox"/> Sort out broken, shriveled and discolored grains/seed	
<input type="checkbox"/> Sort according to varieties	
<input type="checkbox"/> Grade according to grain/seed size	
<input type="checkbox"/> Package according to popular demand	
<input type="checkbox"/> Display fresh and old product separately	
<input type="checkbox"/> Sell grain and seed separately	
Others (specify).....	

Observation code: 1=true; 2= false; 3= can't confirm **(Note to the enumerators: this observation is to be made by the interviewer on what s/he sees on display; multiple responses possible)**

Thanks for giving me your time.

Annex 7.3: Focus Group Discussion (FGD) Guide

FAO Standard
Seed Security Assessment : Focus Group Discussion (FGD)

Note

- Text highlighted in YELLOW to be modified or replaced after adapting the questionnaire to local context. Amend Excel Spreadsheet.
- Text in BLUE are note to the enumerators

Note: The questions below are only guides; they should be amended during training before you go to the village depending on (i) what you already know (ii) main themes of interest. If you are uncertain, or run out of ideas, they may help you to run the FGD. Most important is to allow free expression, to guide discussions and to adequately record content, opinions, quotes, dynamics and emotional reactions, which you will interpret and analyse for your discussion report.

Introduction: You are all welcome to be part of this focus group discussion on seed system. We are **XX** and **YY**. We work for the **United Nations' FAO/Other**. We want to understand how seed system works in this community. It a free discussion and no one will be judge right or wrong. It is all about sharing our experiences, opinions and points for consideration. The responses will be shared with organizations working on seed for any improvement requires of their action.

Date _____
Name of the facilitator _____
Name of the Recorder _____
Location: **Amend location accordingly**
1. Province: _____
2. County _____
3. Sub-county _____
4. Ward: _____
5. Village _____

Number of participants:

Age group	Men	Women
Youth (19 – 35)		
Mature (36-60)		
Elders (>60 years)		

PART 1. OPEN QUESTIONS TO ALLOW THE GROUP TO EXPRESS ITSELF FREELY ON HOW THEY RELATE TO SEED

1. How has the community changed its practices in the way it grows crops, in your lifetimes? Which challenges remain as far as crop production is concerned? (Recorder: please ensure you capture at least keywords, and quickly develop codes e.g. 'gr hat' for a person with a green hat, so you can record what they say throughout)

2. Specifically, how has the community changed the way it uses crops?

PART 2. MAIN CROPS AND ACCESS TO SEEDS

- 2.1 Which are 'number 1 most important and 2 & 3 important, the crops you grow for food, and which are 1-2-3 important to sell?

Note: ask this lightly, recorder should not show the grid, but spend time checking if people agree. If not, use 'ranking' where you agree a moveable symbol (or paper) for each crop and ask people to move it. Or use 'scoring' (e.g. 10 'voting bean each)

Importance	Food	Crops for income
1		
2		
3		

- 2.3 For your whole community, which crops you grow on more land, and which you grow on less land, in the last 5 years? (If you used symbol/paper 'Move the symbol / paper 'up' if more land, and 'down' if less' (NB: Facilitator has to be very clear which is 'up' e.g. away from participants, and which is 'down', probably going closer to them)... 'Why do you grow more or less?')

2.3.1 Which Crops have INCREASED land area cultivated in the last five years?

Crops	Reasons why

2.3.2 Which Crops have DECREASED in land area cultivated in the last five years?

Crops	Reasons why?

2.3.3 Varieties which have DISAPPEARED over the last years?

Crops	Why?

2.3.2 Which are the New varieties which are adopted in the area?

Crops	Why?

2.4.1 For your most important crop (A, B, C), could you show me where you get seeds from? And rank them or use proportional piling to obtain their order of importance. See example of seed source mapping below – NEVER do it yourself. Let the participants do the mapping and discuss. If there has been an obvious crisis, amend this to 'how you got before the crisis?' and stage two 'after the crisis?' [Note: If you are confident to facilitate community maps, encourage farmers to make one for their most important crop pre-crisis, using drawings in sand or on paper.]

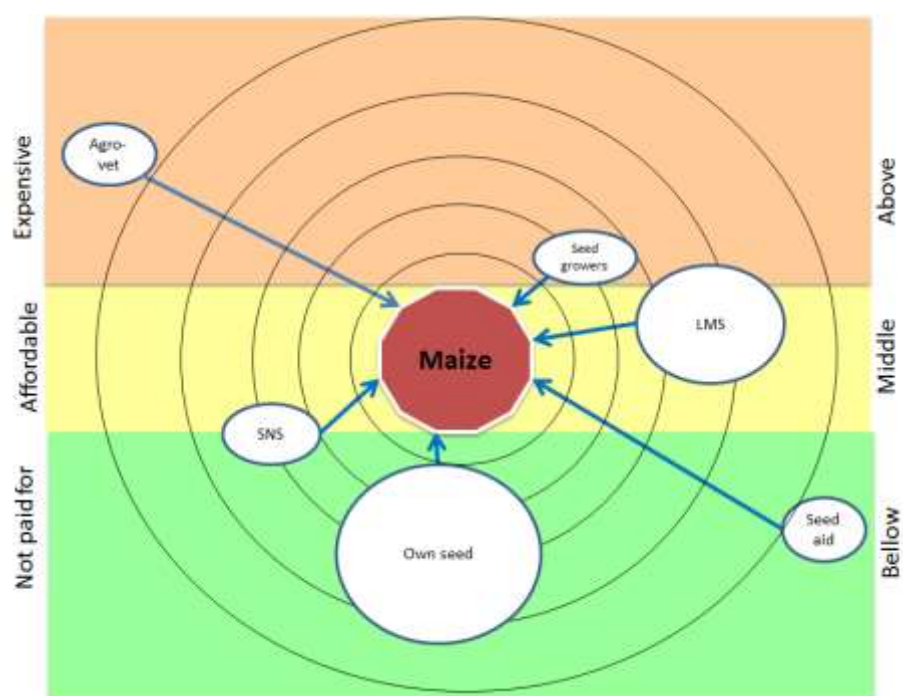
Mapping Rules and Steps

- Availability from various sources
 1. Supply (quantity)
 1. Larger circles or papers are used for important sources (provide more seed)
 2. Smaller circles or papers for less important (provide less quantity of seed).
 3. Proportional pilling (use bean seed or small stones) can be used to quantify the proportion of seed coming from different sources.
- Seed access (affordability)
 1. Seed sources not paid for are placed below the crop
 2. Seed sources which are paid for (cash or bartered) but affordable are placed on the same horizon (middle) with the crop
 3. Seed sources which is paid for (cash or bartered) but expensive is placed above the crop.
- Availability from various sources
 1. Proximity
 1. Nearer seed sources are placed closer to the crop in the center
 2. Distance seed sources are placed farther away from the crop in the center.

Allow them to create a separate map for the main crop post-crisis; and then repeat for the second most important crop. NB: external facilitators must never draw or make the maps themselves.

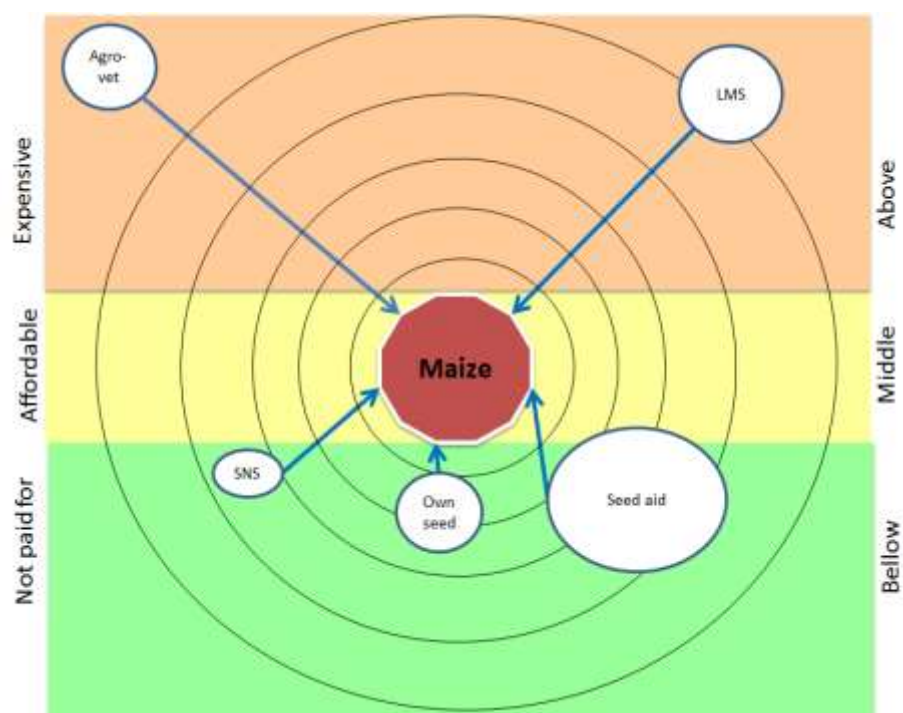
Example of seed source mapping (pre- and post-crisis)

a) Pre-Crisis maize seed sources map



b) Post-Crisis maize seed sources map

Note, seed becomes the most important seed source and is brought closer to the community. There are no seed producers while the functional markets (LM and Agro-I-dealers becomes further and expensive for the farmers.



2.4.2 For your second most important crop, please show me how you get seeds? **Let them repeat this for the second and third important crops.**

2.4.3 From the sources mapped above, investigate about the quality (germination and purity) price of the seed?

	OSS	LoMS	SNS	Agro-Input dealers	SAS
a) Quality					

Quality: 1= BAD; 2= AVERAGE; 3=GOOD;

2.4.4 What are the advantages (pro) and disadvantages (cons) of the different seed sources you are using for this crop?

Seed source	Pro	Cons
OSS		
LoMS		
SSN		
Agro-I-Dealers		
SAS		

2.4.5 Which are the three main varieties of **maize** grown by the famers in this area? Could you rank these varieties in order of their importance and explain why they are more or less important?

Three major varieties	Rank?	Why? Pro	Why? Cons
A)			
B)			
C)			
List other varieties:			

Ranking: The facilitator may use participatory pairwise raking or voting to arrive at the rank. Allow the participants to discuss the suitability (pro-and cons) of these varieties in relation to adaptability and their end use (preference).

Note: Repeat 2.4.1 to 2.4.5 for all the important crops (A, B & C)

2.5 Seed Insecurity Perception and Options for improvement

2.5.1 Do you think there is seed problem in this community? ☐ Yes (1) ☐ No (0)

2.5.2 If Yes/No, why? _____

2.5.3 What could be the main solution for seed problem in this community?

PART 3. RECENT HISTORY

3.1 During the last few years, how many agricultural seasons have been good, average or bad? Why?

Note: To facilitate a timeline, assist the farmers to create one using available space (e.g. on a table, wall or in the sand) and materials (bean or maize grains or stones). Ask them to visually represent good, average and bad seasons by placing markers (e.g. stones or beans or maize grains) above the timeline (year and season) to show good, average or production. Ask questions – How? Why? Who? What? Etc.) As they do this, one of the participants could choose to put their answers in the grid below.

Example on production timeline

Good	Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ				Δ Δ Δ Δ Δ Δ Δ Δ				Δ Δ Δ Δ Δ Δ	Δ Δ Δ Δ Δ Δ Δ
Average		Δ Δ Δ Δ Δ				Δ Δ Δ Δ Δ				
Bad			Δ Δ Δ Δ				Δ Δ Δ Δ Δ Δ Δ			
Season	a	b	a	b	a	b	a	b	a	b
Year	2011		2012		2013		2014		2015	

Amend years and seasons accordingly

Key: POOR=0-4 stones or beans (Δ); AVERAGE= 5 Stones or beans (Δ), and; GOOD=6-10 stones or beans (Δ)

3.2 Where you have had crises, what has the impact been? Which groups suffered most? Did any groups not have enough seed? Was the quality of seed affected in any way? How did you respond to the crisis?

Note Keep asking questions based on the interests of participants, keeping most of them 'open' e.g. 'How?' 'Why?' Keep checking the body language and participation of participants to see if they have had enough; keep any promises you made on timing)

Many thanks again for your time. We will pass on all of the information you have given us, to inform future seed work in your region.

Thanks for giving me your time.

Annex 7.4: Key Informant Interview (KII) Guide

FAO Standard
Seed Security Assessment : Key Informant Interview (KII)

Note

- Text highlighted in YELLOW to be modified or replaced after adapting the questionnaire to local context.
- Text in BLUE are note to the enumerators

The responses from the KII have to be recorded in a note book

Target: Key Government, FAO and NGOs Officials e.g. Government agriculture officers at Zonal, County, District or lower levels; FAO Field officer; NGO Programme Officers/Coordinators – at regional/zonal, county, district or lower levels

Objective: These guide questions will help the SSA team get an overview of the crop/seed system in the state/county. It is important to have such general information in order to situate the specific data collected from the FGD, HHS and LMS as well as find out who else could be interviewed on seed security.

Part I: Crop Production/Seed System Overview

- Which are the main crops grown in this **state/county**? Which are most important for food and which for income? Is there an evolution in the importance of these crops? If so, which are increasing in area, which are decreasing? Why?
- Are there any 'value chain' projects and/or any projects supporting farmers in this area? If yes, who runs the project, where?
- Please share any documents that you have on the agriculture in your **state and county**.

Part II: Seed Formal Seed Sector Operation

- Are there agro-input dealers in the **state/county**? If yes, how many and what crop seed do they sell? Are they registered with the relevant ministry?
- Are there seed-producing groups in this **state/county**? If yes, where are they? What are they producing? Who ensures the quality of the seed they are producing? Are there projects that support seed multiplication in the **state/county**? Who runs these projects?
- Do you have access to seed policy documents OR any seed assessment document/reports? If yes, what would you consider as the strengths and weaknesses of these policy document/reports? Can you provide us with copies? Could you also provide us with any seed intervention/evaluation report?

Part III: Seed security in generals

- In this **state/region/county**, do farmers have access to adequate seed of the right varieties they need in time for planting?
- Are there concerns around the quality of the seed planted or being planted in this area?
- Are there some varieties considered unsuitable but being promoted in the areas and why? Which varieties are these?

Part IV: Disaster/Crisis

- What do you consider as major disasters/crisis normally affect seed security of the community this **state/county**?
- In which year would you consider this disaster having affected seed security significantly? And why?
- How do you describe these disasters – chronic, acute, mild or severe?
- What are the mitigation measures in place?

Part V: Most Vulnerable

- Who do you regard as most vulnerable farmers in communities? And why?
- Do women farmers have specific needs? If, yes, what are their three major needs

Part VI: Food security and nutrition

- In your view, what is the food security situation of the community in this **state, location**?
- Can you briefly describe/explain to us about malnutrition in this **state/county**? *(ask a nutrition expert this question)*

18. *Where the discussion is about malnutrition.* What are the major contributing factors to malnutrition?
(ask nutrition experts)

Part VII: Important documents and contact

19. Are there any other important **agricultural and nutrition information documents** you might be able to share with us? (This could be overviews, or yearly reports or evaluations. etc. Even seasonal data could be useful).
20. Are there key contacts to which the SSA team should speak/consult?
 - Key people?
 - Key organizations?

Annex 7.5: Agro-Input Dealers Questionnaire

FAO Standard
Seed Security Assessment : Agro-Input Dealers Questionnaires (A-I-D)

Note

- a. Text highlighted in YELLOW to be modified or replaced after adapting the questionnaire to local context. Amend Excel Spreadsheet for data entry as well.
- b. Text in BLUE are notes to the enumerators
- c. Figures in brackets () are codes for data entry

Introduction: We are **XX** and **YY**. We work for the **United Nations' FAO/Other**. We want to understand how seed system works in this area. A number of farmers have indicated to us that they buy their seed from agro-input dealers like you. I would therefore like to request for you time if possible.

Permission granted: Thanks for agreeing to this interview. Feel free to serve your customers as we move along with the interview. The responses will be shared with organizations working on seed for any improvement required of their action.

Questionnaire number.→			Data entry number→	
------------------------	--	--	--------------------	--

Objectives:

- To identify varieties of crops being sold by the agro input dealers
- To determine availability, access and quality related issues from agro-input business.
- To understand the demand and supply of (certified) seed.

Section 1. Details location

- 1.1 Name of Enumerator: _____
- 1.2 Organization _____
- 1.3 Date: _____
- Location** (to be modified based on the country's administrative units -biggest to lowest e.g. Kenya)
- 1.4 Province: _____
- 1.5 County _____
- 1.6 Sub-county _____
- 1.7 Ward _____
- 1.8 Name of the market _____

Section 2: Agro-Input Business Information

- 2.1 Name of the Business _____
- 2.2 Name of sales agent (respondent): _____
- 2.3 Age: _____
- 2.4 Gender (Sex): ☐ Male (1) ☐ Female (0)
- 2.5 Education ☐ No formal (1) ☐ Primary school (2) ☐ Secondary (3) ☐ Tertiary (4)
- 2.6 Mobile #: _____

2.7 For how many years have you been in the agro-input business? _____

2.8 Do you have another branch elsewhere?

☐ Yes (1)

☐

No (0)

2.9 Which agro inputs do you deal in? **(Multiple responses)**

- | | | |
|-------------------------------------------------|---------------------------------------------|--------------------------------------------|
| <input type="checkbox"/> Crop Seed (1) | <input type="checkbox"/> Vegetable Seed (2) | <input type="checkbox"/> Pasture seed (3) |
| <input type="checkbox"/> Agro-chemicals (4) | <input type="checkbox"/> Fertilizers (5) | <input type="checkbox"/> Hand tools (6) |
| <input type="checkbox"/> Animal ploughs (7) | <input type="checkbox"/> Jab planters (8) | <input type="checkbox"/> Sprayers (9) |
| <input type="checkbox"/> Other Equipment (10) | <input type="checkbox"/> Animal drugs (11) | <input type="checkbox"/> Animal feeds (12) |
| <input type="checkbox"/> Others (specify) _____ | | |

2.10 What type of seed do you sell? **Add or remove crop(s) based on most likely one to be found in local market. Adjust the codes as well)**

Cereals	<input type="checkbox"/> Sorghum =1	<input type="checkbox"/> Maize=2	<input type="checkbox"/> Rice=3	
	<input type="checkbox"/> Finger millet =4	<input type="checkbox"/> bulrush (pearl) millet =5	<input type="checkbox"/> Wheat=6	<input type="checkbox"/> Teff = 7
Oilseed	<input type="checkbox"/> Groundnut=8	<input type="checkbox"/> Sesame=9	<input type="checkbox"/> Sunflower =10	
Pulses	<input type="checkbox"/> Beans=11	<input type="checkbox"/> Cowpea=12	<input type="checkbox"/> Green grams =13	
	<input type="checkbox"/> French beans=14	<input type="checkbox"/> Pigeon peas = 15	<input type="checkbox"/> Soya = 16	<input type="checkbox"/> Dolicos = 17
Vegetables	<input type="checkbox"/> Tomato =18	<input type="checkbox"/> Eggplant =19	<input type="checkbox"/> Onion =20	.....
	<input type="checkbox"/> Green pepper =21	<input type="checkbox"/> Red pepper =22	<input type="checkbox"/> Radish =23	.....
	<input type="checkbox"/> Cabbage =24	<input type="checkbox"/> Kales =25	<input type="checkbox"/> Cauliflower =26	.....
Pasture	<input type="checkbox"/> Lab-lab=27	<input type="checkbox"/> Elephant grass=28	<input type="checkbox"/> Alfalfa=29	.....

Section 3: Crop Seed Demand and Supply

3.1 Which are the five top most selling crop seed? **(The dealer can sell just 1, 2 or 3 crops only)**

	Crop A	Crop B	Crop C	Crop D	Crop E
Crop Name					
Rank (1, 2....5)					
If two or more crops, then rank them 1=most important, 5=least important					

3.2. Of the above crops, which are three varieties that you sell most? **(For each of the varieties mentioned, ask the questions in the table)**

Crop A (Name.....)

	Variety (i)	Variety (ii)	Variety (iii)

a) Variety (name)			
b) Common packaging unit (kg)			
c) Packaging materials (make observation)			
d) Current Price (Shilling)			
e) Price (Shilling) at planting			
f) Price (Shilling) one month before planting			
g) Quantity (kg) in stock now			
h) Quantity (kg) commonly bought by farmers			
i) Quantity (kg) sold during planting season			
j) Months of highest sales			
k) Ranking of varieties as per demand (1-3)			
l) Main Supplier			
m) Location of the supplier			
n) Other varieties (names)			

Crop B (Name.....)

	Variety (i)	Variety (ii)	Variety (iii)
a) Variety (name)			
b) Common packaging unit (kg)			
c) Packaging materials (make observation)			
d) Current Price (Shilling)			
e) Price (Shilling) at planting			
f) Price (Shilling) one month before planting			
g) Quantity (kg) in stock now			
h) Quantity (kg) commonly bought by farmers			

i) Quantity (kg) sold during planting season			
j) Month of highest sales			
k) Ranking of varieties as per demand (1-3). Two varieties can have the same rank			
l) Main Supplier			
m) Location of the supplier			
n) Other varieties (names)			

Crop C (Name.....)

	Variety (i)	Variety (ii)	Variety (iii)
a) Variety (name)			
b) Common packaging unit (kg)			
c) Packaging materials (make observation)			
d) Current Price (Shilling)			
e) Price (Shilling) at planting			
f) Price (Shilling) one month before planting			
g) Quantity (Kg) in stock now			
h) Quantity (kg) commonly bought by farmers			
i) Quantity (kg) sold during planting season			
j) Month of highest sales			
k) Ranking of varieties as per demand (1-3)			
l) Main Supplier			
m) Location of the supplier			
n) Other varieties (Name)			

Crop D (Name.....)

	Variety (i)	Variety (ii)	Variety (iii)
a) Variety (name)			
b) Common packaging unit (kg)			
c) Packaging materials (make observation)			
d) Current Price (Shilling)			
e) Price (Shilling) at planting			
f) Price (Shilling) one month before planting			

g) Quantity (Kg) in stock now			
h) Quantity (kg) commonly bought by famers			
i) Quantity (kg) sold during planting season			
j) Month of highest sales			
k) Ranking of varieties as per demand (1-3)			
l) Main Supplier			
m) Location of the supplier			
n) Other varieties (Name)			

Crop E (Name.....)

	Variety (i)	Variety (ii)	Variety (iii)
a) Variety (name)			
b) Common packaging unit (kg)			
c) Packaging materials (make observation)			
d) Current Price (Shilling)			
e) Price (Shilling) at planting			
f) Price (Shilling) one month before planting			
g) Quantity (Kg) in stock now			
h) Quantity (kg) commonly bought by famers			
i) Quantity (kg) sold during planting season			
j) Month of highest sales			
k) Ranking of varieties as per demand (1-3)			
l) Main Supplier			
m) Location of the supplier			
n) Other varieties (Name)			

3.3 Who is your MAIN customer (Note to the enumerators: Please select only one)

- ☐ Individual farmers (1)
 ☐ Farmer groups (2)
 ☐ NGOs/UN (3)
 ☐ Government (4)
 ☐ Other Agro-Input dealers (5)
 ☐ Traders (6)
 ☐ Others (specify) _____

3.4 If Yes, to which location(s) and how far is this location from here?

Name of the Location	How far? (code below)	Name of the Location	How far? (code below)
1.....	1.....	.....
2.	2. ....	.....

Distance: 1= Within the Woreda; Another Woreda within the Zone ; 3= Neighboring Zone; far away Zone; 5= outside the county (These have to revised based on the country's administrative zoning)

(Note to the enumerators: Multiple responses possible)

3.7 Do you sometimes provide seed on credit to farmers who want seed during planting season?

- ☐ Yes (1)
 ☐ No (0)

3.8 Of the farmers who buy seed, what proportion (%) getting it on credit? (You may ask out of 20 of those who buy seed, how many get credit?) _____

	Seed
Proportion (out of 20) get credit	

3.9 Do you sometimes exchange seed with other good from the farmers during planting time?

- ☐ Yes (1)
 ☐ No (0)

3.10 How do you handle unexpected over demand of seed?

Section 4: Seed Storage

4.1 Where do you store your seed?

Storage place Comment on what you have seen only

- ☐ Within the market stall (1)
 ☐ Store (2)
 ☐ Silos (3)
 Others (specify)

Note to the enumerators: Multiple responses possible for where)

4.2 In what type of bag or container do you keep bulk your seeds?

Containers Containers

- ☐ Jute bags (1) ☐ Sisal bags (2) ☐ Polythene bags (3)
☐ Plastic containers (4) ☐ Metal containers (5) ☐ Boxes (6)
Others (specify)..... ☐ ☐

Note to the enumerators: Multiple responses possible

4.3 Where are the seed bags or containers placed during storage?

- ☐ On mud floor (1) ☐ On cemented floor (2) ☐ On pellets (3)
☐ On wooden shelves (4) ☐ On concrete shelves (5) ☐
☐ ☐ ☐

Section 5: Fertilizer Demand and Supply

5.1 Do you also sell fertilizers?

- ☐ Yes (1) ☐ No (0)

5.2 Of the farmers who buy crop and vegetable seed, what proportion (%) also buy fertilizers at the same time? (You may ask out of 20 of those who buy seed, how many buy fertilizers?)

	Crop seed	Vegetable seed
Proportion (out of 20) who buy fertilizers		

5.3 If yes, which types of fertilizers? ☐ Urea ☐ NPK ☐ DAP

c) Fertilize (name)	Urea	NPK	DAP
d) Current price (Shilling) per 50kg bag			
e) Current price (Shilling) per kg			
f) Quantity (Kg) in stock now			
g) Average quantity (kg) commonly bought by famers			
h) Quantity (kg) sold during planting season			
i) Month of highest sales			
j) Ranking of fertilize type as per demand			
k) Main Supplier			
l) Location of the supplier			

Section 6: After sale services and feedback

6.1 What kind of after sales services do you normally offer your customers in relation to seed and fertilizer

- a)

- b)

- c)

6.2 Do you normally get positive and negative feedback from your regular customers? ☐ Yes (1)
☐ No (0)

6.3 If yes, what are some of the common feedback you receive?

Positive	Year/Season	Negative	Year/Season
a)		a)	
b)		b)	
c)		c)	

Section 7: Challenges and Way forwards

7.1 What are the three top challenges in your seed business?

- a)
.....
.....
- b)
.....
.....
- c)
.....
.....

7.2 Do you have any suggestions to improve farmers' access – particularly poorer farmers - to seed and fertilizers?

- a)
.....
.....
- b)
.....
.....
- c)
.....
.....

Thanks for giving me your time.

Annex 7.6: Seed Growers Farmers / Groups Guide

FAO Standard
Seed Security Assessment : GUIDE QUESTIONS TO SEED GROWER FARMERS / GROUPS

Note:

Target: Seed grower farmer or seed grower groups: which grow seed on a more business-oriented approach, either as contract growers or as their own business at county, district or lower levels

Please include this question only if a group is addressed.

Introduction: We are XX and YY. We work for the United Nations' FAO/Other. We want to understand how seed system works in this area. A number of farmers / local seed traders have indicated to us that they buy their seed from you as a seed grower or from the seed growers group. I would therefore like to request for you time if possible.

Objective: These guide questions will help the SSA team get an overview of the crop/seed system in the state/county. It is important to have such general information in order to situate the specific data collected from the FGD, HHS and LMS as well as find out who else could be interviewed on seed security.

II. GROUP BACKGROUND AND STRUCTURE

1. When and why was the group formed? How is the group managed? and is management staff volunteer or salaried?
2. How many members were there at the time of forming the group? How many members do you have now? (categories the number by gender, and consider looking at the youth composition within the group)
3. What are other group's activities or enterprises if any in addition to seed

III. SEED PRODUCTION ACTIVITIES

4. Which are the crops and varieties you are multiplying? Why did you choose these crops and varieties? What kind of starter seed did you use and where did you get the 'starter' seed to multiply from? What was the cost of the starter seed? For each crop, what area did you plant last year (2014)? How much did you harvest from the area planted last year?

Crop	Variety		Area planted (acres)	Starter seed		Harvest (kg)
	Name	type		kind	source	

Type: 1=Local; 2=improved
Kind: 1= certified seed; 2=foundation seed; 3=none of the two
Source: 1=our previous harvest; 2= agro-input dealer; 3=local markets; 4=Seed Aid; 5=Research; 6=seed company

5. Briefly described how production is organized and managed? Individuals with their own field? Individuals producing on a block farm? Group field? Contracted by Seed Company as out grower?

6. What are your costs of production for the different seeds that you produce?

7. Are your production fields normally inspected? If Yes, by who? How many times is the seed field inspected and when are inspections normally done? Do you get feedback on the quality of your seed from the inspectors and/or customers?

8. How do you handle your seed after harvesting? Do you have a threshing/drying floor? Seed Store?

9. Could you please describe the facilities/equipment you have for handling your seed? *Type of structure, size and management etc*

10. Of all the seed you produced last year or **last season (2014)**, what proportion have you sold? To whom did you sell the seed – to farmers, retail or to agro-dealers or to next user intermediaries (FAO, NGOs, MoA)? What is your price for each of the crop seed?

Crop	Harvest (kg)	Quantity (kg) sold	Average price per kg	Quantity (kg) in store	Buyers

Buyer: who buys? 1= famers; 2=other traders who sell to other famers; 3=government/FAO/NGOs; 4=Others (specify)

11. Could you please describe how you organize marketing of your seed?

12. What in kind or financial / material (in kind) support for this activities have you received or are you getting from your seed business partner (for contract farmers only)?

IV: CAPACITY BUILDING AND TRAINING

13. Have your group members been trained in seed production, conditioning and marketing? If yes, when and by who? How was the training conducted?
Workshop with demonstration? Farmer Field School? How many of your members have been trained?

14. What is the isolation requirements for the crops you have been multiplying?

15. What other capacity building programme has your group received?

V: CONSTRAINTS

16. What are the major challenges that you are currently facing in your seed activities

17. Of the assistance that you receive, which do you feel you could continue without and which do you feel is indispensable to your continuing sustainability? (only when they have got assistance)

18. Compared to the price of seed in the local market, what premium do you feel farmers will be willing to pay for your seed?

19. What crop or variety is there the greatest farmer demand? Which of your products do you think the most profitable?

VI: INVESTMENT PLAN

20. How would you compare the seed that you produce and sell to the seed that farmers produce and save themselves or purchased in the local market:

- i. Physical quality?
- ii. Germination?
- iii. Varietal purity?
- iv. Varietal suitability?
- v. Value?
- vi. What else?

21. What are your plans for the upcoming season?

Annex 7.7: Seed Aid Actors Guide

FAO Standard
Seed Security Assessment : Seed Aid Actors

Note

Text highlighted in YELLOW to be modified or replaced after adapting the questionnaire to local context.

Target: Key Government, FAO and NGOs Officials e.g. Government agriculture officers; FAO Field officer; NGO Programme Officers/Coordinators – at regional/zonal, county, district or lower levels

Introduction: We are **XX** and **YY**. We work for the **United Nations' FAO/Other**. We want to understand how seed system works in this area and therefore are interested to know the interventions your organization has done related to any kind of seed aid / assistance in the past or coming seasons. I would therefore like to request for you time if possible.

1.0 BACKGROUND

1.1 For how long have you been providing seed to the community in this state/County?.....years

1.2 Who were your seed beneficiaries in **2013** ?

Vulnerable host IDPs Returnees Refugees

1.3 How many households did you distribute seed to in the past five years? Where did you source your seed from?

Year	# Beneficiaries HH	Quantity (kg)	Seed source	Donor	Project value
2014 (Target)					
2013					
2012					
2011					
2010					
Seed Source: Local famers; 2= seed growers from within; 3= local traders; 4=registered seed traders; 5=seed company from within; 6= seed company from outside the county; 7=Another NGO/FAO/Government;					

1.4 Which crop/varieties did you distribute to the beneficiaries last year (**2013**) and what is your plan for this year (**2014**)

Year	Crop	Variety	Quantity (kg)
2013			
2014			

1.5. Where/when did you distribute to the beneficiaries last year (2013), and what is your plan for this year (2014)

	County	When (month)	Distribution approach
2013			
2014			
Mode of distribution: 1= Direct Seed Distribution; 2=Fairs and Voucher; 3=Vouchers only;			

1.6 What do you normally do to ensure that **quality seed** and **right varieties** are provided **on time** to the famers?

Quality:

Right Varieties:

On time:

2.0 REFLECTING ON FAMERS RESPONSE (HH) ON SEED AID FROM THE SSCF POINT OF VIEW

Introduce the parameter by stating that ‘farmers responded in our individual interviews that there was a problem with ‘x’. We would like to follow up with those problems with you at this time.

Timing (seed arrived late)

- Why did farmers receive the seed late?
- What can be done to ensure farmers have timely access to seed?

Proximity (farmers had to travel long distances)

- How can seed be made accessible closer to farmers in the future?

Quantity (farmers received a fraction of the seed requirement)

- How did you decide on the quantity of seed per crop per farmer?

Transaction and Price (the seed was too expensive)

- If farmers were required to pay for seed or provided seed on recovery, why was this decided?
- How was the price or recovery amount established?
- How did farmers pay back - in cash or in kind?
- What was the rate of repayment?

Physical Seed Quality (the seed was not clean)

- What was the cause of poor physical quality?
- What procedures were in place to ensure clean seed?

Seed Viability (the seed did not germinate well)

- do you test the seed before distributing it to the famers? What tests do you normally do?
- What do you think could have been the cause of the poor viability?
- What procedures were in place to ensure high germination is maintained?

Preferred Varieties (the varieties were not known to farmers)

- Were you aware that you were providing varieties that we not farmer preferred?
- If so, why did you make this decision?

Adapted Varieties (the varieties did not perform well)

- Why did you believe that the varieties distributed were adapted and would do well under farmer management?

Strengths in your seed aid activity

What went particularly well in your activity and why was this?

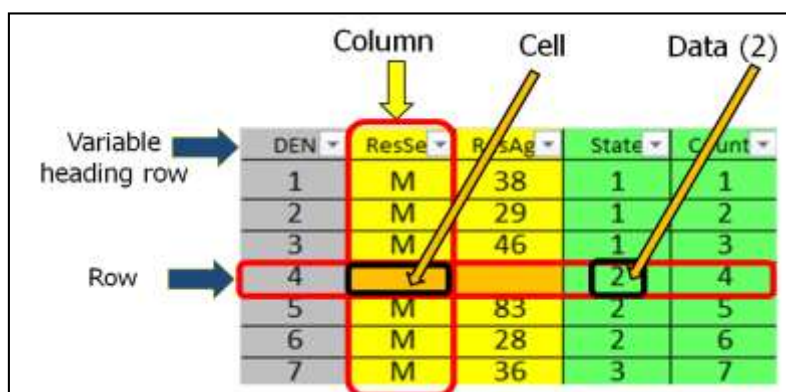
Closing Questions

1. Were you satisfied with the seed aid activity you implemented?
2. What did you learn from this experience?
3. What will you do differently next time?

ANNEX 8: CREATING MS EXCEL DATA BASE

When you open a Microsoft Excel programme, a new file (Book1) appears on your screen. This file normally consist of three work sheets (new work sheet can always be added). Every work sheet consists of **Columns** and **Rows**, and the intersections between the columns and rows are the **Cells** (Figure 10). Cells are points within a sheet where data (variables) are entered. Questionnaires normally contain a number of variables with volumes of data which are entered into cells under each variable column.

Figure 10: MS Excel sheet



	DEN	ResSe	ResAg	State	Count
1		M	38	1	1
2		M	29	1	2
3		M	46	1	3
4				2	4
5		M	83	2	5
6		M	28	2	6
7		M	36	3	7

In designing a database the first row is normally dedicated for defining the variable headings, where each variable is defined in only one column and the cells below this are used for entering data corresponding to the variable heading. On the other hand, one column (normally the first one) is used to define data entry number. As a general rule of thumb;

- d) **Column** - Variables are normally coded as headings of columns in variable heading row. A column is normally used for only one variable e.g. Gender, Age, Income etc.
- e) **Row (s)** – All rows below the variable headings row can be used for entering data. The information from a single questionnaire is entered into row(s) **corresponding** to the questionnaire **data entry number (DEN)**. A single questionnaire should never be assigned more than one data entry number, and no two or more questionnaires should have same data entry number assigned to them. One or two rows above the variable heading row could be used to enter the question numbers corresponding to the variables (see Figure 11).
- f) **Cells** - One cell, one response

Figure 11: MS Excel table with filters

	Qn.1.1	Qn.1.2	Qn.2.1	Qn.2.2	Qn.2.3	3.1	3.2
DEN	County	Sub-coun	Age.grou	Res.Gend	Educatio	HH_Gend	HH_Size
1	Kitui	Kitui Central	2	m	3	m	3
2	Kitui	Kitui Central	3	f	2	m	7
3	Kitui	Kitui Central	3	f	2	f	6
4	Kitui	Katulani	3	f	2	f	5
5	Kitui	Katulani	1	f	3	m	8
6	Kitui	Katulani	4	f	1	f	3
7	Makueni	Mbooni	4	m	1	m	13
8	Makueni	Mbooni	2	f	3	m	7
9	Makueni	Mbooni	3	m	3	m	4
10	Makueni	Mbooni	3	m	4	m	5
11	Makueni	Kibwezi	3	f	2	m	5
12	Makueni	Kibwezi	4	f	1	f	5

Defining variables and coding responses

As mentioned earlier, variables from a questionnaire are defined in the **variable heading rows**. When defining variable headings, only continuous characters are used i.e. no space between characters. For a single response such as gender of head of households (HH) the variable could be defined as **HH.Gender** or **HH_Gender** and not HH Gender.

For multiple response questions such as – What crops did you plant last season? Here, each possible response (e.g. sorghum, maize, beans) is a variable – and thus occupies a column - within which a value is typed, in this case yes (1) or No (0).

Responses in a questionnaire are sometimes given codes; for example reason for planting less area of land – 1=lack of access to land; 2=lack of seed; 3=sickens ----- and others (specified) in the questionnaires. Those others have to be given codes as well.

SSA data entry clerks are strongly advised to make use of the database structure which has been designed by the FAO SSA development team.

Cell validation and data entry

To minimize errors during data entry, certain variable columns should be validated to restrict entering unexpected data or certain characters and/or range.

Before any data entry begins a questionnaire is given a number and no two questionnaires should have the same number. The existence of a questionnaire number makes strong link between the computer (soft) copy and the paper form and will be useful in the data cleaning stage.

Different variables have different data types depending on the type of variable.

- Discontinuous (categorical, classificatory, discrete) variables: variables that cannot be divided into fractions or take finite numbers, e.g. gender (male or female), livestock presence (Yes or No); residential status (Resident, IDP, Refugee, Returnee). These variables can be represented by text e.g. initials (m for male and f for female) or could be assigned numeric codes such as 1=Yes, 0= No; 1=Resident , 2=IDP, 3=Refugee and, 4=Returnee
- Continuous variables – variables that can be divided into fractions or take infinite number of values e.g. Income, temperature, age, area planted, seed quantities, production, yields. These

variables are entered as numbers with no unit of measurement attached e.g. for 10kg of seed planted, the quantity of seed planted is normally entered as 10 and not 10kg.

- c) Note to the data clerk - Units for measuring continuous variables may vary from individual to individual or from place to place. This must be standardized before or during data entry.

In order to ensure quality data is entered into the database, the team leader should put extra efforts to supervise data entry clerks. In controlling the data entry, the team leader should randomly sample questionnaires that have been entered by the data clerk and verify them using the data entry numbers in database to check if they have been entered correctly. Data entry control is normally done at the end of each day during the data entry process. This process should be done together with the data entry staff in order for him/her to see the mistakes made and build up his/her awareness where to take more care.

Data-entry mistakes and how to correct them

Codification or simple entry mistakes should be corrected immediately according to the information in the questionnaire. These mistakes are more common in the first days or when the work is done in a rush, but should reduce with time. If a higher frequency of such kind of mistakes is recorded; a higher number of questionnaires should be verified.

Another common data entry mistake is a shift in the columns of the data entries, as either one column was skipped somewhere or entered too early. In these cases, the whole questionnaire should be entered again. One way to minimize column related data entry error is to use different colors for different columns according to the corresponding section of the questionnaire. This allows the data entry clerk to relate the position in the questionnaire to the position in the database.

The importance of accuracy in data entry cannot be overstated, as the correction process can take a lot of work and time.

Data cleaning and verifications

Errors can be introduced during data collection as well as data entry. Before deriving any additional variable or running data analysis, the data manager has to ensure the data is devoid of errors or outliers. In data verification and cleaning, all variables are checked to ensure that there is no error, inconsistent data or outlier. Box 7 gives an example which could either be an error or an outlier. Any inconsistent entries or outliers have to be verified by checking the hard copy of the questionnaire and corrected or appropriate decision made on outliers.

Box 7: Example of an error or outliers

The data clerk entered the following quantity (kg) of sesame seed planted by 10 households; 2, 3.5, 45, 2, 4, 1, 1.5, 2, 5.5 and 2.3. There are two possibilities in this data.

- a) An error introduced by the data clerk during data entry where he/she presses key 4 & 5 simultaneously when he wanted to enter 4 or 5, or fails to press a decimal point well when entering 4.5. This can be corrected by checking the hard copy of the questionnaire and correcting the entry.
- b) An outlier – if after checking the questionnaire the number **45** is found to be a correct entry, a confirmation can be made by calling the enumerator (if he can still remembers) of the famers (if the telephone contact is available). If after checking from all these sources the number (45) is found to be true, then this could be an outlier which could significantly influence the result of the analysis.
- c) In the above data set, when analysis of average quantity of seed planted is done with such outlier, the average is 6.9, and when such outlier is omitted from the data set, the average comes down to 2.6.

NOTE: Outliers could be correct data but are deviate from the normal distribution. Statistically they significantly influence the result of analysis.

Data cleaning is a tedious process that requires patience and time but it should never be skipped. There are two different levels or ways of ensuring the accuracy of the data entered and obtained. The **first level** is filtering the data using the Excel filtering function.

Activation of filter and cleaning of data take the following simple but logical steps after all the data have been entered.

- a) Highlight all the **Variable Headings**
- b) Go to **Data** menu and click on **Sort & Filter** icon. Drop down menu will appear on the right side of every variable heading.
- c) Click on the drop down icon and scan for any inconsistent data or outlier within the list you see.
- d) Once you identified inconsistent data or outlier, first **De-select All**, and then **Select** the inconsistent or outlier data. Click **OK**. Only selected one(s) will appear on the screen.
- e) Check the **Data Entry Number(s)** corresponding to inconsistent or outlier data identified, Go back to the **Hard Copy** of the questionnaire and **Correct**.
- f) Where the inconsistent or the outlier is existing in the hard copy, **Consult** the enumerator or team leader for correction.
- g) In the event that neither the hard copy nor the enumerator/team leader can help, the data manager will have to make judgment to **Omit (Delete)** the inconsistent outlier data if it will affect the final analysis.

The second level is to verify the consistency in the link between two related variables, for example:

- 1 A household cannot have more land cultivated with the different crops in a specific season than the total available land for the same season;

- 2 A household has no cash savings made in a season but the corresponding variable showed the institution where the cash has been saved.

These errors can be avoided by programming failsafe parameters into the database, so that it would be impossible to enter data that is not consistent. Failing this, the most suitable correction process is to verify with the corresponding questionnaire or through logical deduction.

Deriving variables

Certain variables such as yields, seed rates, multiplication rates, animal units are normally not collected directly using the questionnaires but are derived from two or more variables. For example, yield which is the quantity harvested per unit area of land is derived from quantity harvested from a given area planted by the farmers. For any additional derived variable, a column has to be inserted and appropriate calculation has to be done. The most suitable and easy way for this process is to use formulas. Once the calculations have been made, you have to verify the results, as sometime the results are not correct where data is missing or a number is divided by zero, which is shown with the following symbol: **#DIV/0!** in the database. Those entries have to be deleted before proceeding with the data analysis.

Example of data entry staff guidelines from Nepal

Things to be remembered for data entry staff

- 1 You should clearly understand that success and reliability of this study depends on quality of your work as a data entry clerk. You are doing a vital work of this study so you should do it seriously and honestly.
- 2 You should have a good knowledge about the structure of questionnaire, codes for responses for data entry and the database itself. You have been provided training on these aspects to make you eased and efficient.
- 3 The database is prepared on Microsoft Excel spreadsheet so you should have good knowledge of Excel and you should know about how to work with Excel before you start your work.
- 4 You are provided training on above mentioned aspects, which is a prerequisite for your data entry work. If you have confusion even after training, you should contact your supervisor for further clarification.
- 5 You should entry the responses from the questionnaire into the database following the provided codes and specific instructions.
- 6 Whilst entering data, you should know the nature of each question, whether it is a single option question or a multiple responses possible question. The single option or multiple responses possible question is mentioned in the questionnaire. Dependent of the type of response there are either one column in the database for the single option question or more than one for the multiple questions option. Each response has to be entered into a different column of the database.
- 7 There are some questions on which you have to enter quantities. The enumerators could have collected the information in specified unit (local or standard). So you should be very careful about the units mentioned in the questionnaire. If it is mentioned in local units then you should convert them into standard units, the conversion table is provided to you. The standard units are kg (for weights) and hectares (for areas / surfaces).
- 8 If you find some confusion in the questionnaire, you should note down such confusions and inform your supervisor. He will help you to clarify the responses or take necessary decision if needed.
- 9 You should check whether your computer is connected with UPS (written on the sockets), if not then you should save your work every 5 minutes (as there are quite often electricity disturbance occurring in the city). This will help you to save your work even when the power goes out.
- 10 You are given a specific limited time to accomplish your work and you have to complete it within given time frame.
- 11 Attention should be given when missing data and no response is given, in principal these are empty cells, except for the numeric information (quantitative) where a ZERO should be entered.
- 12 Attention should be also given to enter the correct data into the correct column of the database, especially when the no responses or not applicability means column with empty cells.

Data control and supervisor responsibilities

- 13 The supervisor should control around 3% of the questionnaires entered by each of the data entry staff after the first day. In case there are many mistakes the sample should be expanded to 10%. If there are too many mistakes it is recommendable either to train the staff again and make it clear he / she has to improve or when considered it is not worth to dismiss her / him.
- 14 The supervisor has to highlight to each of the data entry staff difficulties or issues raised by one of the staff which is of concern of everybody, example: new weight measurement and their conversion, misunderstanding of a specific questions, etc.
- 15 In case there is some confusion about the writing or the corrections made by the enumerators, the supervisor should assist the data entry staff to solve their confusion and make the correct decision.
- 16 In case during the controlling of the data, outliers are identified (inconsistent data – outside a normal range), first you should check it against the questionnaires response. If the entry is correctly entered and you find it is still inconsistent then you have two possibilities, either discard it (empty space) or in case the sample size is quite large and there are not too many outliers then you could keep it, as they will not have a significant influence during the data analysis.
- 17 After each day of work the supervisor has to get a brief from the data entry staff about their progress made and the difficulties faced. This will allow the supervisor to prepare the material for the next day.
- 18 The supervisor should make a backup on a second electronic support of the data entered twice a day (lunch time and evening) in order to reduce the risk of data loss.

THANK YOU AND WISH YOU ALL THE BEST DURING THE PROCESS

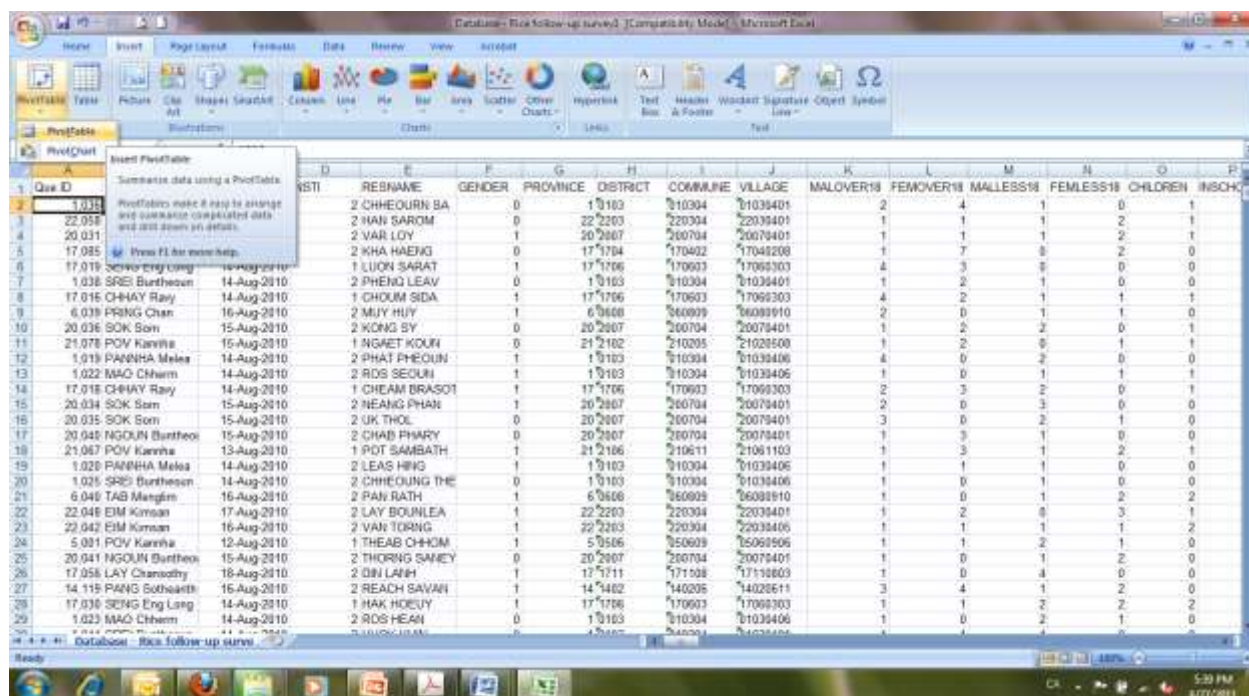
ANNEX 9: BASIC STEPS IN RUNNING ANALYSIS USING A PIVOT TABLE IN MS EXCEL

Instructions for MS Excel 2010

Step 1: Open MS Excel and open a file or database that is already managed and cleaned.

Step 2: Go to the Menu and look for “Insert” tab. In the Insert tab you will find a Table group. Click on PivotTable and then on PivotTable as shown in Window 1 **Error! Reference source not found..**

Window 1



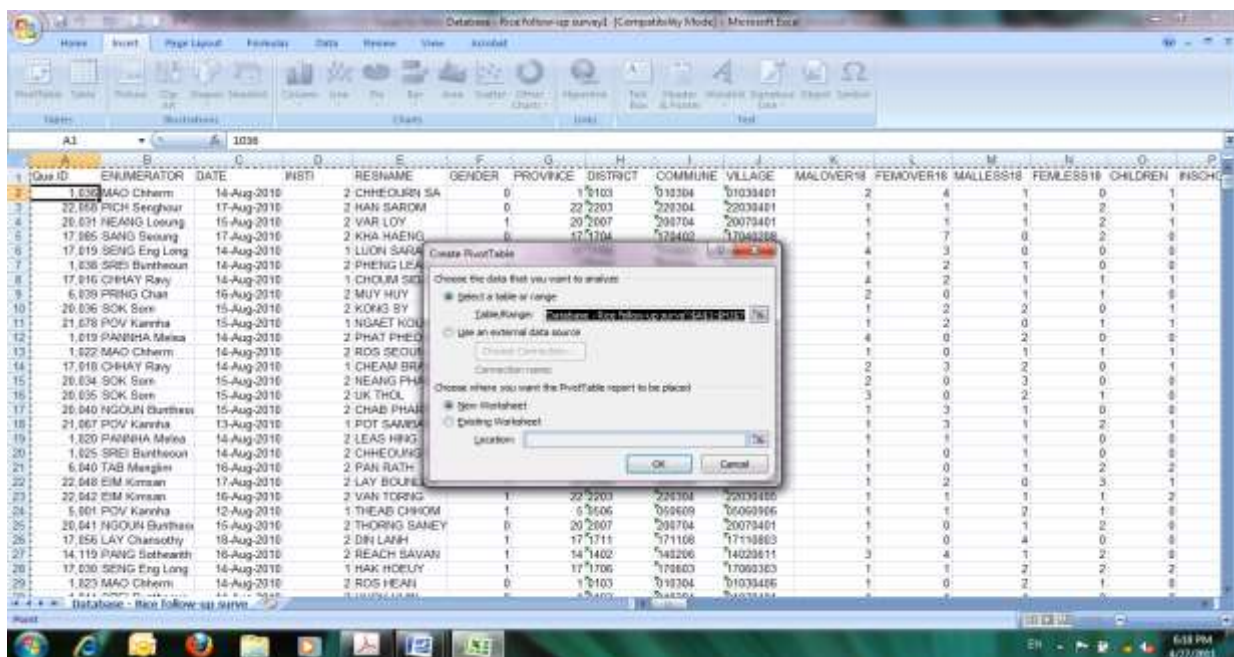
Step 3: After clicking on it, Excel will automatically display a dialog box called “Create PivotTable”, please see Window 2 **Error! Reference source not found..** Now the program is asking about which data or range of data is to be analyzed. Automatically, if your database is completely cleaned and ready for analysis, Excel will select all of the data available in the work sheet.

The displayed dialog box provides the following options:

“Choose the data that you want to analyze”: the available options are the following:

- ☉ “Select a table or range”: this is asking what data available in the work sheet to be selected for analysis.
- ☉ “Use an external data source”: this option enables us to use data from outside e.g. other server.

Window 2



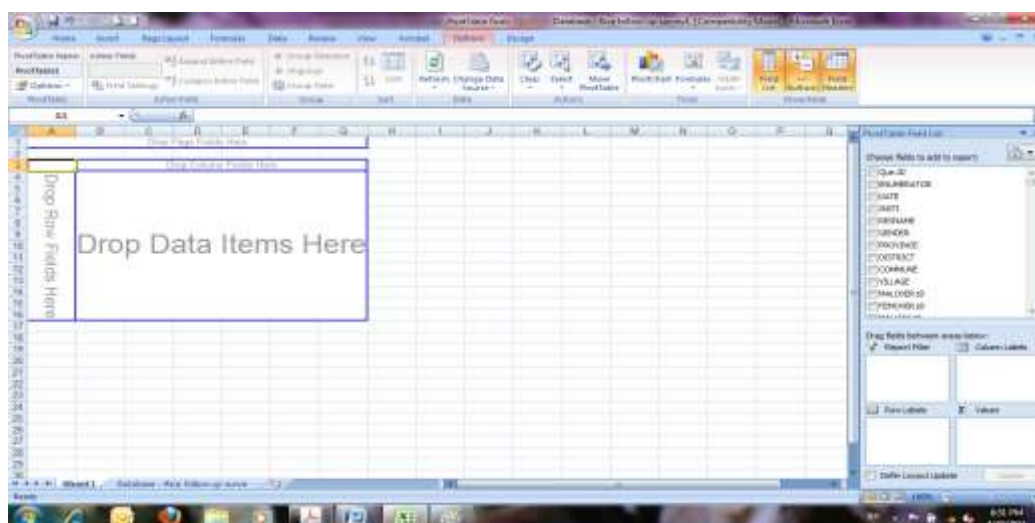
Choose where you want the PivotTable report to be placed: this is to ask us where to put the produced PivotTable. The available options are as follows:

- ☉ New Work sheet: if this is selected the produced PivotTable will be placed in a new work sheet, which is newly created automatically.
- ☉ Existing Work sheet: if this is selected the produced PivotTable will be placed in any available / created work sheet. If this option is selected we need to define which work sheet to be used by specifying in the Location box. Row and Column also should be clearly specified.

After completing all of these steps, click on OK button.

Step 4: Next, the following Window will be shown **Error! Reference source not found..**

Window 3



The displayed window is divided into two main parts. In the far right part, we will see a dialog box with the name of PivotTable Field List. This dialog enlists all of the variables that we have selected from Step 3 and these variables will be used for the any analysis.

- Note: Variables available in the PivotTable Field List are the name put in the very first row in the work sheet.

Below the same dialog box, we will see a phrase named “Drag field between areas below”. This is where we can take any variables from the above list and put them into analysis and/or calculation based on their types e.g. calculating average, sum, counting, etc.

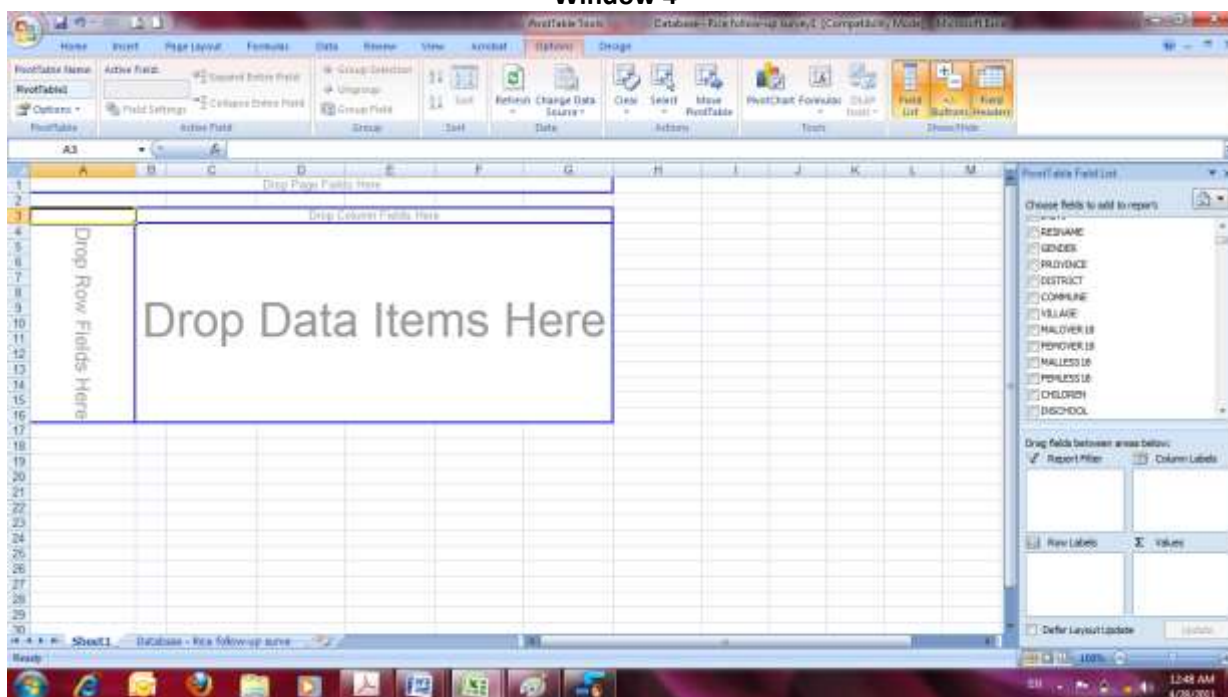
There are two main options to be noticed:

- ∑ Values (at the right bottom of the work sheet): in case we want to sum up the value from all cases of one specific variable we just have to drag that variable and put it into this box. Automatically, Excel will do the calculation of summing for that variable.

OR

- Drop Data Items Herein (at the left upper side of the worksheet), we just have to select the variable whose values are supposed to be analyzed and drag it onto the area named “Drop Data Items Here”. Please see the following window.

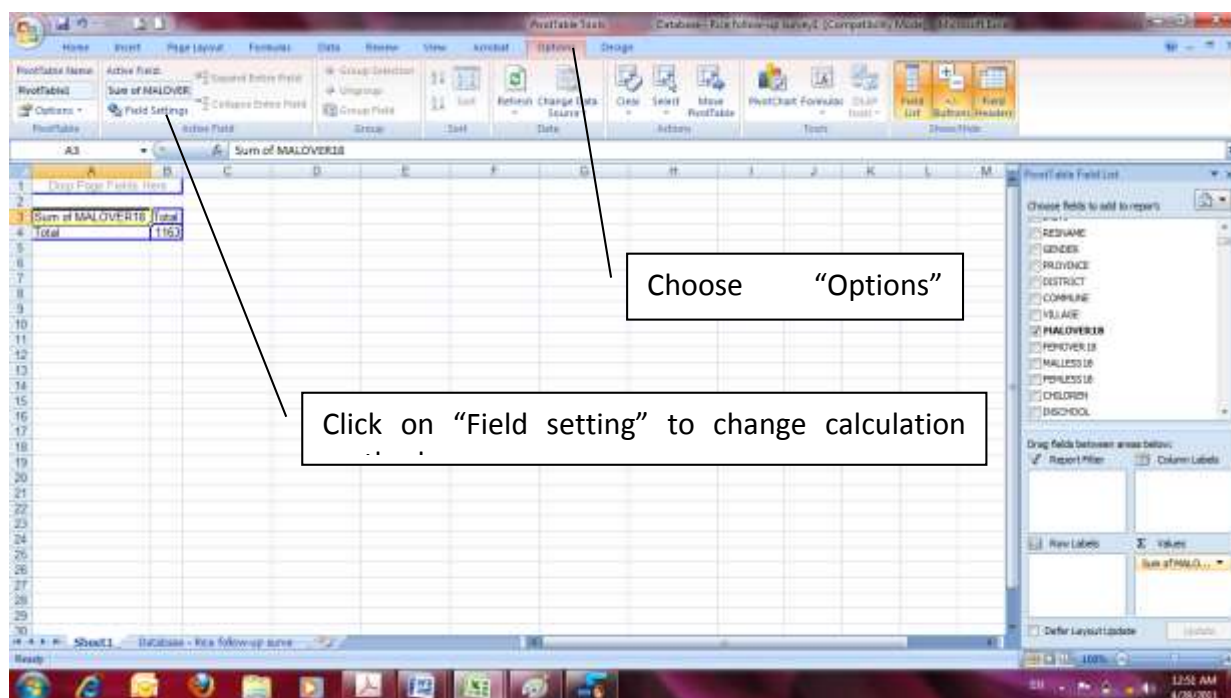
Window 4



As default the sum of the specific variable is made; in case we want to change the analysis from a sum to another calculation, as count number, max, min, StdDeV, etc), follow the instructions below.

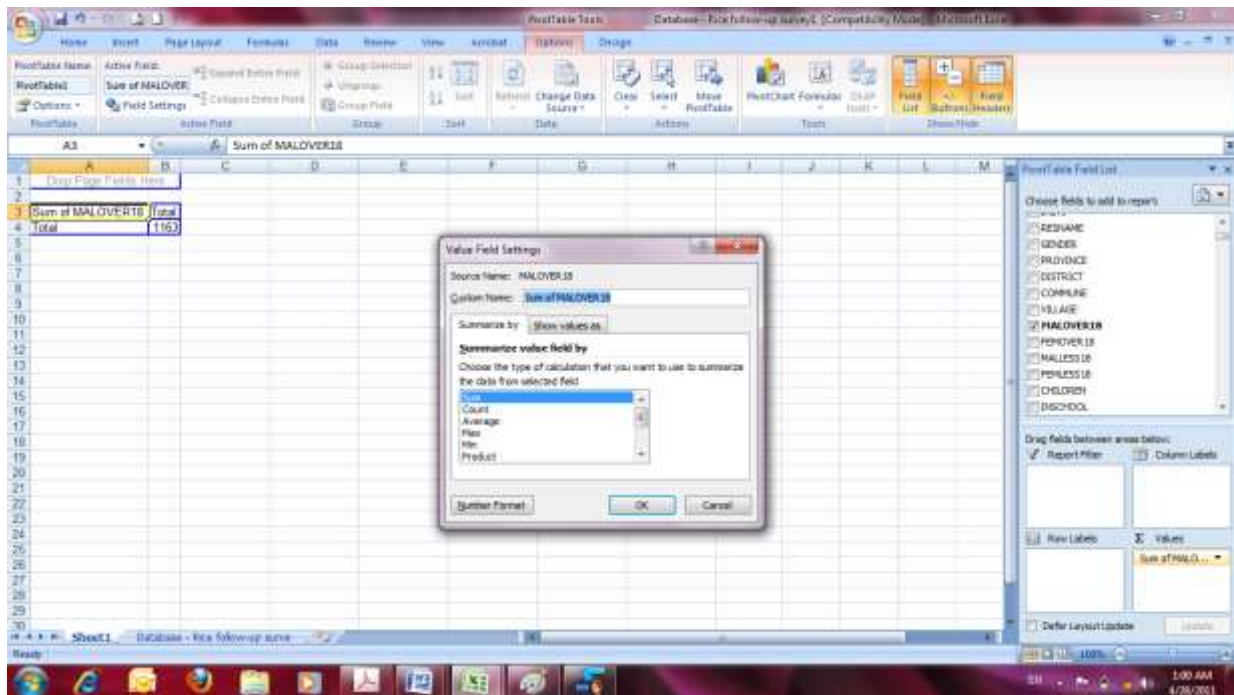
- After completing the dragging of variables onto either “∑ Values” or “Drag Data Items Here” please go to Menu and find “Option”. In the group of “Active Field”, click on “Field Setting”. See **Error! Reference source not found.**below.

Window 5



- The next dialog box will appear with the name as “Value Field Settings”, please see Window 6. Here is to choose any calculation method you would like to run and then click “OK”. The calculation will be done automatically.
- Alternatively, click on Variable name in the “ Σ Values” field setting and the “Value field setting” the dialogue box will appear. Here is to choose any calculation method you would like to run and then click “OK”. The calculation will be done automatically.

Window 6



Row Labels: in case we want to calculate one variable by classifying the result based on another variable, we will have to drag the variable that is used for classifying onto the “Row Labels”. For instance, we want to find out the average of land holdings of farmers classified by their gender (between men and women). To do so, we need to drag the GENDER variable into the “Row Labels” and then drag the variable on landholding into Σ Values or drop it into “Drag Data Items Here”. In general, the variables used for grouping or classifying are the types of Nominal or Ordinal variables.

Column Labels: this is similar to Row Labels. The difference is that the result from “Row Labels” is to classify and appear in row, while from “Column Labels” is to appear in column.

Report Filters: this is also similar to both “Row Labels” and “Column Labels” where all the options of the corresponding parameter are displayed. The difference with the “Report Filters” is that we can select one or more of the possible options of the specific parameter and display the corresponding results accordingly.

Description and use of the common data analysis procedures

As in the questionnaire development, it is important to remember how each type of response can be used during the analysis. The main options are:

Yes / No questions coded as y/n or as 1 and 0: There are two ways to go during the analysis, depending on whether the code is y / n or 1 and 0. If coded 1 for yes and 0 for no, first calculate the sum and calculate later the percentage of 0 and 1 out of the total sample size. For the y and n types of entry, first drag variable heading to the column label and then to Σ Values and then calculate the counts (frequency) for each.

- a) *Single response out of a given list:* these results are mainly used as differentiating parameters which will be placed either in the row or column section of the table layout. In order to get their frequency (count numbers), drag the questionnaire number to Σ Values, then click on the field setting and change to count numbers.

- b) *Quantitative data*: these results are mainly used as data to conduct some calculations in the data section of the table layout. The most common used analysis types are: averages, maximum, minimum, standard deviation, etc. They are also the main datasets which are used deriving additional variable such as yield, total household members, grouping of households by land size. Grouping of households according to land size can be done directly in the database as an additional parameter. Once the classification has been given the codes in the right variable column, then the analysis can be run as follows.
- i. Adjust the data range and update the dataset first.
 - ii. The variable (land size category) to be analyzed should be dragged into the corresponding row or column field setting to set the pivot table for analysis.
 - iii. The variable to be analyzed is again dragged into Σ Values field to run the analysis required, in this case questionnaire number and field settings Count (for frequency) and maintain the other specific parameters as they were before as they will be calculated to the specific differentiating variable accordingly.
 - iv. A differentiating variable such as location, agro-ecological zone, or household type could be placed in the corresponding column field settings in order to analyze the data by location or agro-ecology or household type or a combination of two.
- c) *Qualitative data 1*: coded single response with Others option (specify)....: here predictable responses are normally coded in the questionnaires beforehand, while giving allowances for unpredictable responses as others (specify)..... Here, others have to be coded before the analysis is done. This can be done by the data clerk in consultation with the database manager. The obtained new codes are listed and continued numbered and thereafter the analysis can be done. They can be either used as a differentiating parameters (in column or row) while at the same time the variable questnumber is dragged into Σ Values field to generate count numbers (frequency).
- d) *Qualitative data 2*: from open ended questions. Open ended questions tend to produce a range of qualitative data. Here also the data clerks in consultation with the data manager have the code all the possible responses before the analysis starts.
- i. If the open ended question is a single response, then only one variable entry is possible per questionnaire and a single column is provided.
 - ii. If the open ended question is a multiple response type, then all the possible responses become variables and need different columns.

These are also analysis as in qualitative data 1. The obtained groups (code list) are used as differentiating parameters (in column or row) while at the same time the variable questnumber is dragged into Σ Values field to generate count numbers (frequency).

Use of differentiating (classifying) parameters

The differentiating parameters such as locations, agro-ecologies, household types or seed sources are dragged into the sections of columns or rows in the table layout (1-2 at a time, 3 possible but will generate complex tables). In the example in table 4 below, the type of households is the differentiating

parameter, and the variables such as number of men or the number of animal units are the analyzed variables.

Running analysis:

- a) Here the differentiating parameter (household type) is normally dragged into a column or row field settings.
- b) The variable (number of men) to be analyzed dragged into the corresponding row or column field setting to set the pivot table for analysis.
- c) The variable to be analyzed is again dragged into Σ Values field to run the analysis required, in this case average number of men.
- d) Ensure that the Value field setting is set to the right type of analysis in this case average.
- e) Where an average is calculated, a standard deviation analysis can be done to see if the averages are significantly different from overall the mean.

Table 4: Use of differentiating parameters

Parameter	Household types			Overall results	
	Residents	Returnees	IDP	Mean	Std. Dev.
Mean of men	1.40	1.39	1.45	1.42	0.15
Mean of animal units	7.22	5.67	2.60	4.7	0.86

From the above example (Table 4) the average number of men per family is not significantly different among the various categories (residents, returnees, IDP). The type of household (differentiating parameter) therefore has no influence on this average and the overall average is the one to be reported. However, there were significant differences recorded in between the average number of animals among the various categories. Therefore in this case, the type of household is a significant differentiating parameter for this parameter. This process has to be done for each of the obtained tables.

Standard Deviation (σ or Std. Dev.) – Is a quantity expressing by how much the members of a group differ from the average value for the group. There are two types of standard deviation: population standard deviation and sample standard deviation. Sample standard deviation is used when we want to make statements about the population from the sample. If a value from the sample falls outside of the sample standard deviation we can say with a high level of confidence that the value is significantly different from the average of the **population**. This is a powerful statement that helps us in deciding if differences in our sample are representative of differences within the overall population from which the sample is drawn.

Taking the example from Table 4 above: Overall, (i.e. for the total sample of households) the average number of animals per household is 4.7 with a standard sample deviation of 0.86. Therefore, to be significantly different from this overall average, means for sub-groups within the sample should fall **outside** the range 4.7 ± 0.86 i.e. 3.86 to 5.56. Looking at the table we can see that indeed the animal unit figure for all the subgroups is outside that range. Therefore the mean number of animal units for different sub-groups is significantly different from the overall mean. For IDPs it is significantly less – meaning that we can be highly confident that IDPs do have significantly fewer animals than the overall average within the population as a whole. Whereas, for both returnees and residents it is significantly more, meaning that we can be highly confident that these groups have significantly more animals in the population as a whole.

Instructions for MS Excel XP / 2003

In the instructions that follow, the windows always relate to the instructions presented in the preceding bullet points.

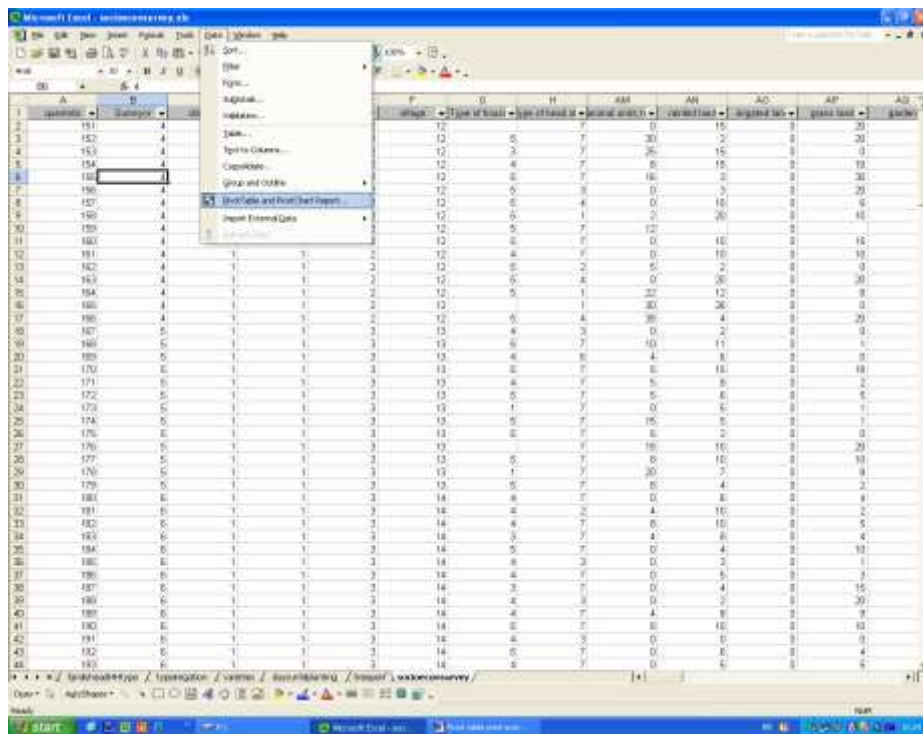
First open the Excel file that contains the database seen in Window 1. The database has to have one row with the headings of each of the different columns. Each heading has to have a different name. Make the names as short as possible but still in a way that you can identify easily the information or kind of response entered under this column, which will help to conduct the data analysis process. Each of the other rows below represents the data of a specific questionnaire, where the initial number makes the links between them.

Window 1

	A	B	C	D	E	F	G	H	I	J	K	L	M
	variety	country	district	Tehsil	Urban centre	village	Type of house	type of head of	annual yield	ruined land	irrigated land	gross land	garden
1	151	4	1	1	2	12	5	7	0	15	0	20	
2	152	4	1	1	2	12	5	7	30	2	0	30	
3	153	4	1	1	2	12	5	7	25	15	0	0	
4	154	4	1	1	2	12	5	7	8	15	0	10	
5	155	4	1	1	2	12	5	7	16	3	0	30	
6	156	4	1	1	2	12	5	5	0	3	0	20	
7	157	4	1	1	2	12	5	4	0	10	0	6	
8	158	4	1	1	2	12	5	1	2	30	0	10	
9	159	4	1	1	2	12	5	7	12				
10	160	4	1	1	2	12	5	7	0	10	0	15	
11	161	4	1	1	2	12	4	7	0	10	0	10	
12	162	4	1	1	2	12	5	2	5	2	0	0	
13	163	4	1	1	2	12	5	4	0	20	0	20	
14	164	4	1	1	2	12	5	1	22	12	0	9	
15	165	4	1	1	2	12	5	1	30	35	0	0	
16	166	4	1	1	2	12	5	4	30	4	0	20	
17	167	5	1	1	3	13	4	3	0	2	0	0	
18	168	5	1	1	3	13	5	7	10	11	0	1	
19	169	5	1	1	3	13	4	6	4	6	0	0	
20	170	5	1	1	3	13	5	7	5	15	0	18	
21	171	5	1	1	3	13	4	7	5	8	0	2	
22	172	5	1	1	3	13	5	7	5	6	0	5	
23	173	5	1	1	3	13	1	7	0	5	0	1	
24	174	5	1	1	3	13	5	7	15	5	0	1	
25	175	5	1	1	3	13	5	7	5	2	0	0	
26	176	5	1	1	3	13	5	7	16	10	0	20	
27	177	5	1	1	3	13	5	7	8	10	0	10	
28	178	5	1	1	3	13	1	7	20	7	0	8	
29	179	5	1	1	3	13	5	7	8	4	0	2	
30	180	6	1	1	3	14	4	7	0	8	0	4	
31	181	6	1	1	3	14	4	2	4	10	0	2	
32	182	6	1	1	3	14	4	7	8	10	0	5	
33	183	6	1	1	3	14	3	7	4	8	0	4	
34	184	6	1	1	3	14	5	7	0	4	0	10	
35	185	6	1	1	3	14	4	3	0	3	0	1	
36	186	6	1	1	3	14	4	7	0	5	0	3	
37	187	6	1	1	3	14	3	7	0	4	0	15	
38	188	6	1	1	3	14	4	3	0	2	0	20	
39	189	6	1	1	3	14	4	7	4	8	0	9	
40	190	6	1	1	3	14	5	7	8	10	0	10	
41	191	6	1	1	3	14	4	3	0	0	0	0	
42	192	6	1	1	3	14	5	7	0	6	0	4	
43	193	6	1	1	3	14	4	7	0	5	0	5	

The Pivot Table feature is an integral part of MS Excel, and can be found in the 'data' menu. Select the option Pivot Table Report as shown in Window 2.

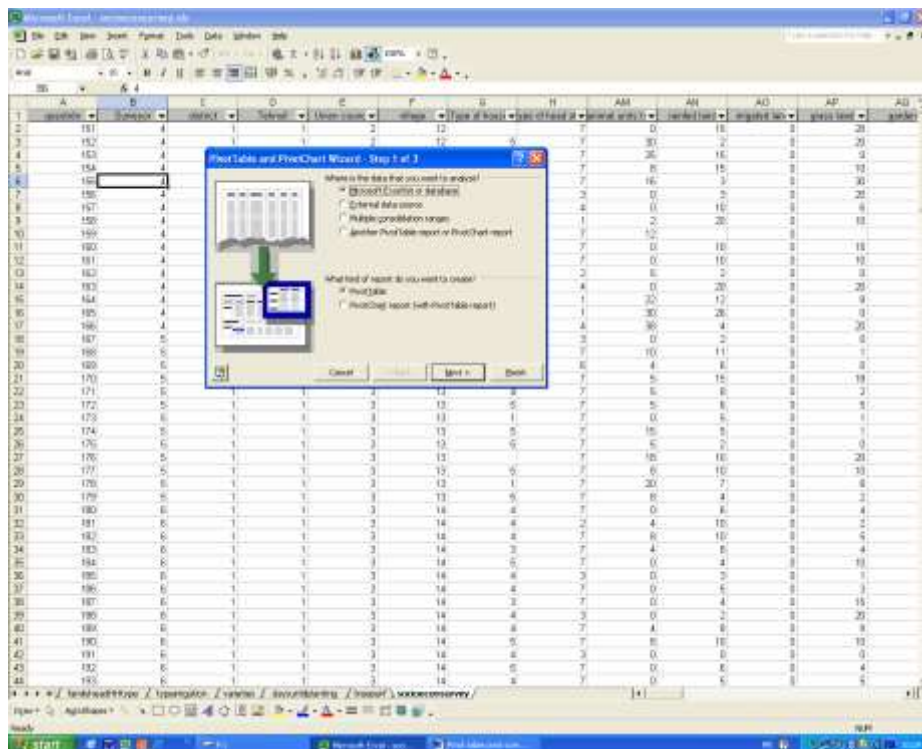
Window 2



Now follow closely the instructions given below.

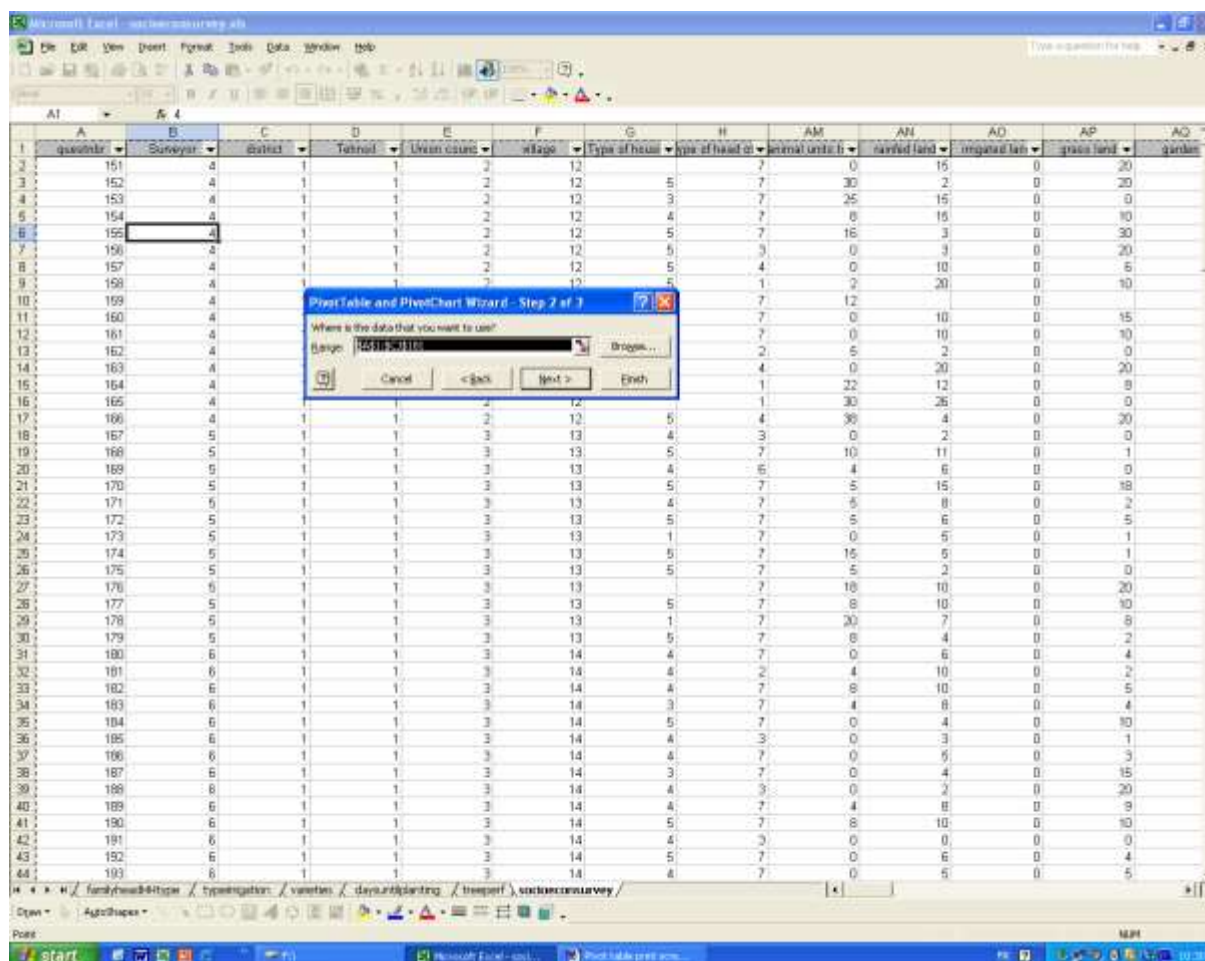
- In the new window, as shown in Window 3, select the option 'Microsoft Excel list or database'.
- Once the selection is made, click 'next'.

Window 3



- Automatically a new window appears, as shown in Window 4, requesting the user to enter a range where the dataset is placed and should be analysed. The most recent version of Excel selects the range automatically, taking the whole dataset in the previously open work sheet. In previous versions it is necessary to enter the range of the whole table using the cursor and then select the whole range directly in the datasheet.

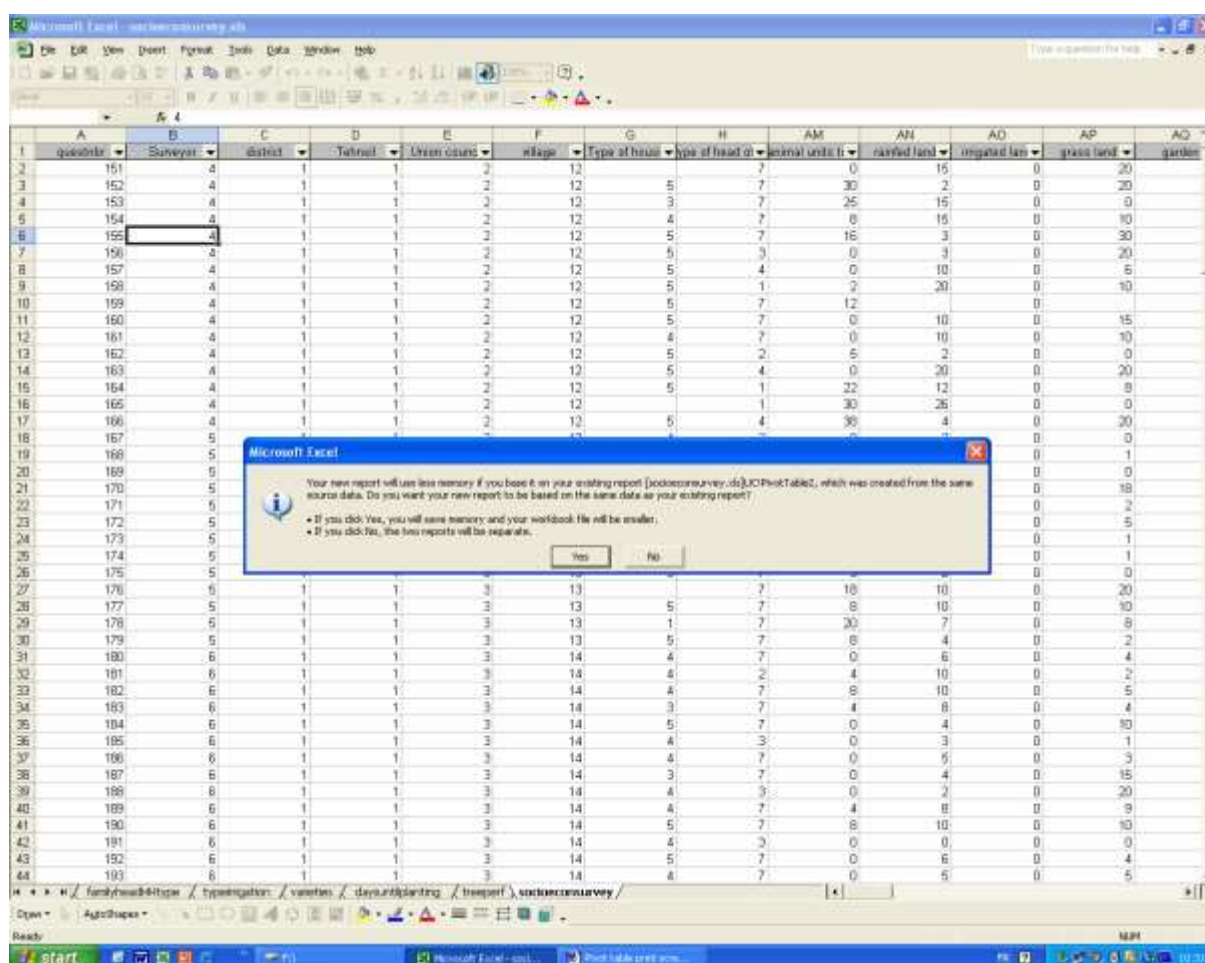
Window 4



After having finished this operation press 'next'.

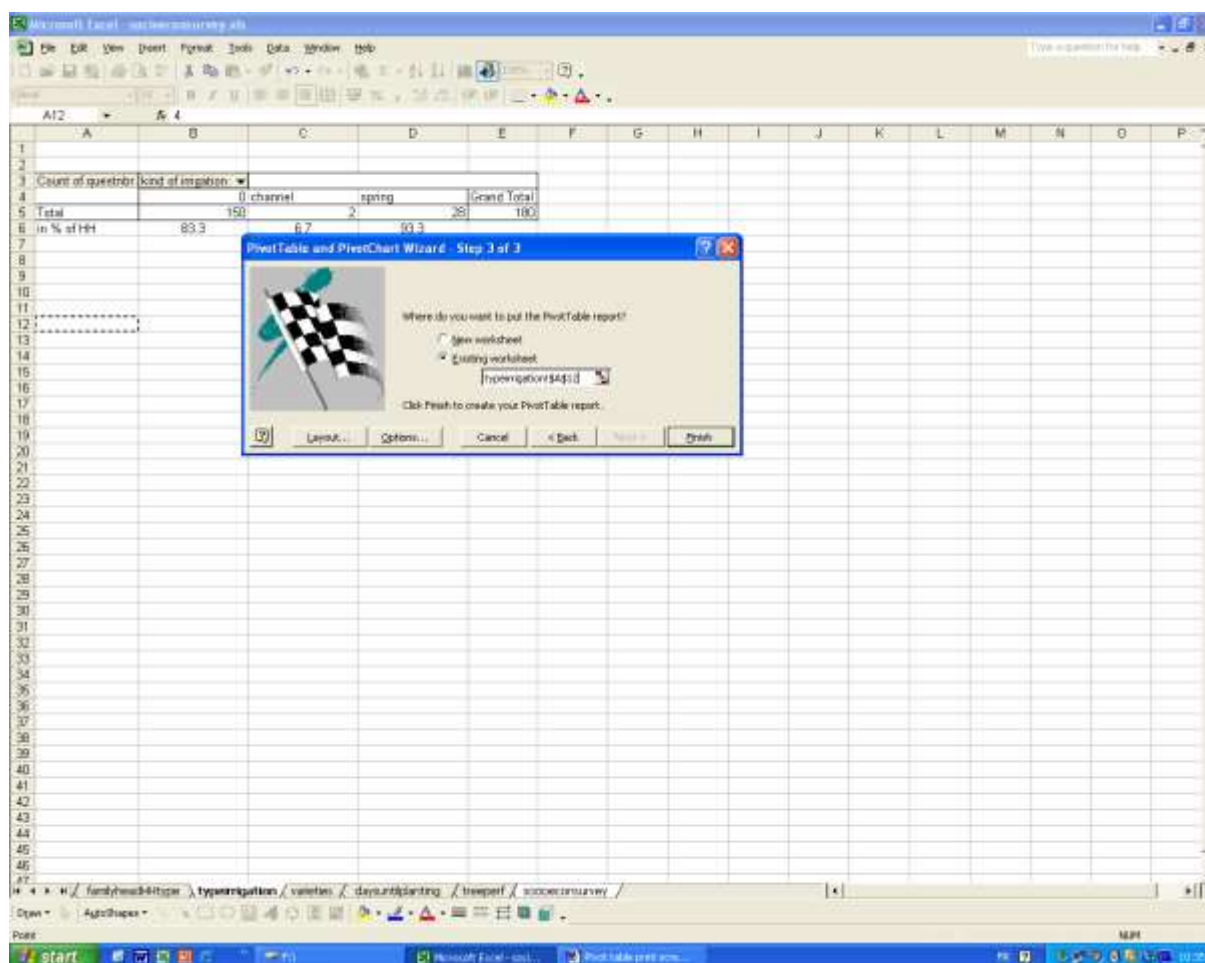
- After the previous step, the next window, as shown in Window 5, asks if the results should be made out of the existing results table or if they should be created using once again the initial data set. This has an implication on the size of the file, which is not a problem, and allows tables to be independent from each other. It is recommended to use the initial dataset, and therefore the 'No' option should be selected. This step is skipped when making calculations for the first time and no results table exists yet.

Window 5



- In the next window, as shown in Window 6 it is necessary to decide where the results should be stored; either in a new work sheet or in an existing one. If you select an existing work sheet, make sure to enter also the range where the table should be placed otherwise the previously-generated result table will be overwritten. In general it is recommended to use a new work sheet each time for the newly generated result tables. This would be more suitable because it will provide a better overview and better handling of the results. The only time the second option (existing work sheet) is preferable is when there is a need to have two tables side by side for comparison reasons. In order to ease the handling of the results, a name should be given to each of the created work sheets to allow identification of the type of information stored in it.

Window 6



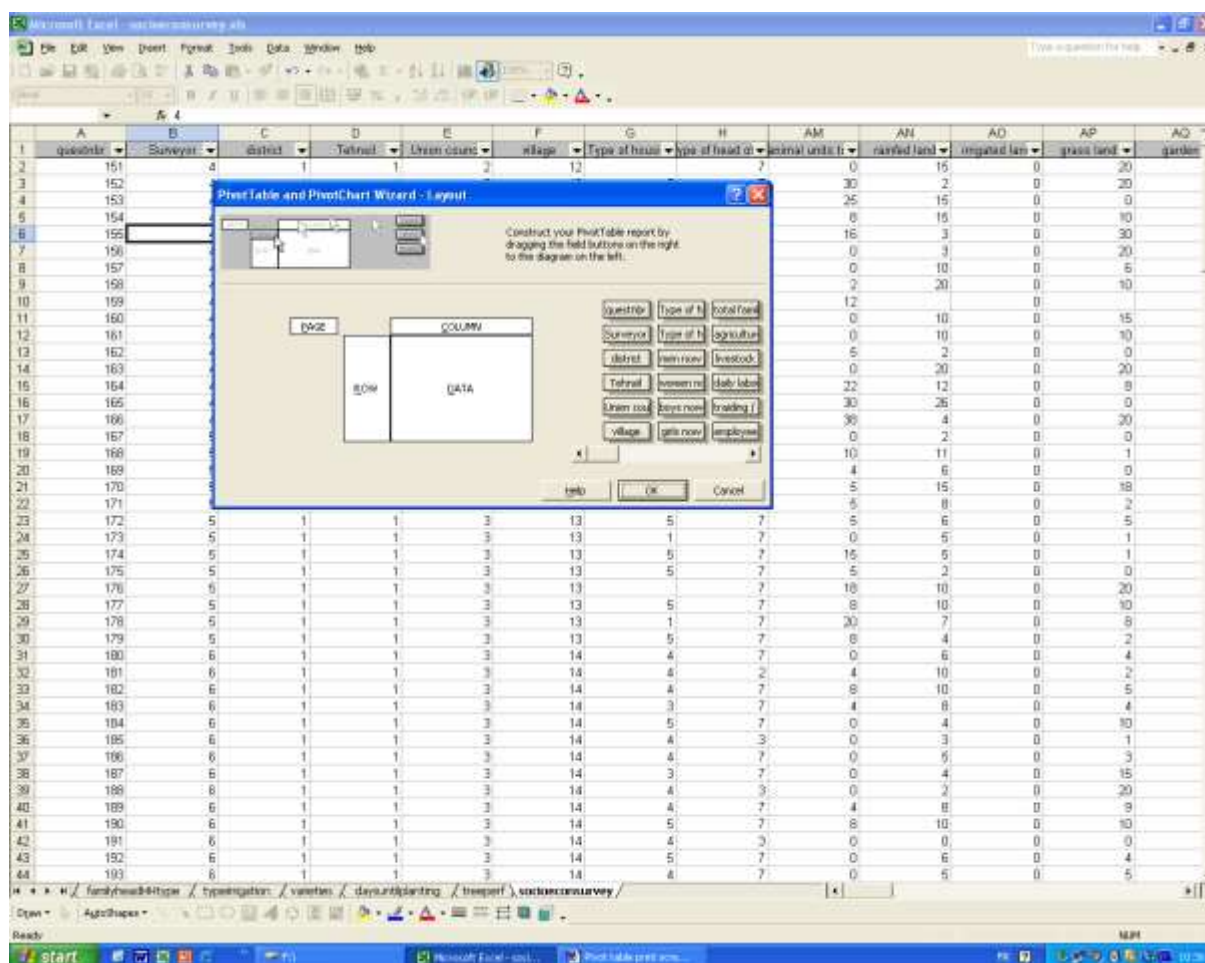
Now select 'layout'.

- In the new window, as shown in Window 7, the frame of a table appears with small boxes containing the headings of the columns of the database.

This is the most challenging part of the data analysis because it is necessary to remember what type of data was entered under each header and the type of information required from them. It is possible to obtain the information directly for averages, sums, maximum, and minimum. It is possible to obtain the information indirectly for percentages by comparing the frequencies with the overall number of entries. The frequency can be obtained by counting numbers for specific entries or calculating the sum from Yes/No questions. Here it is necessary to remember which type of calculations the various types of questions allow.

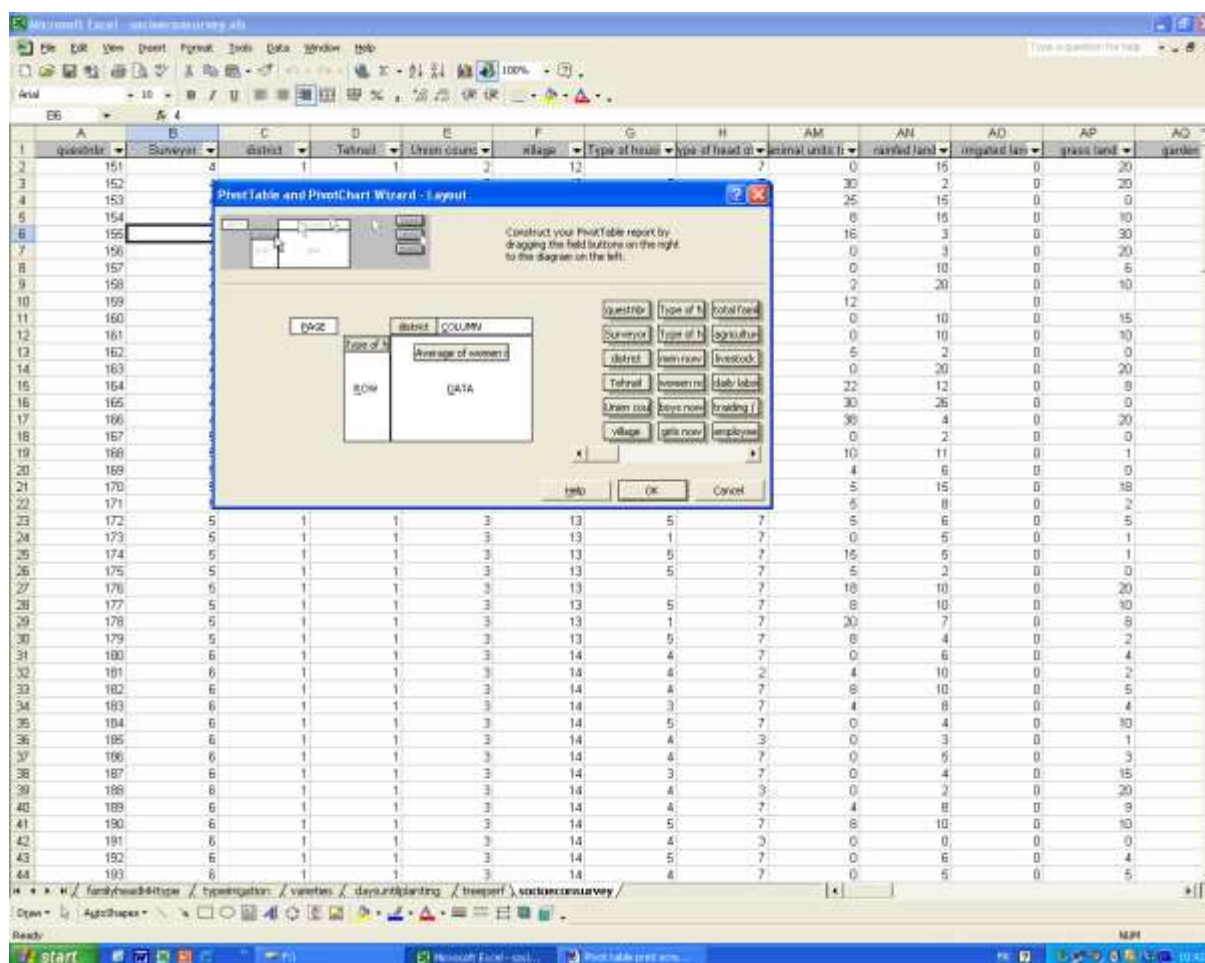
On the right side are all the parameters represented (heading of the columns of your datasheet), and on the left side there is the table that is being created.

Window 7



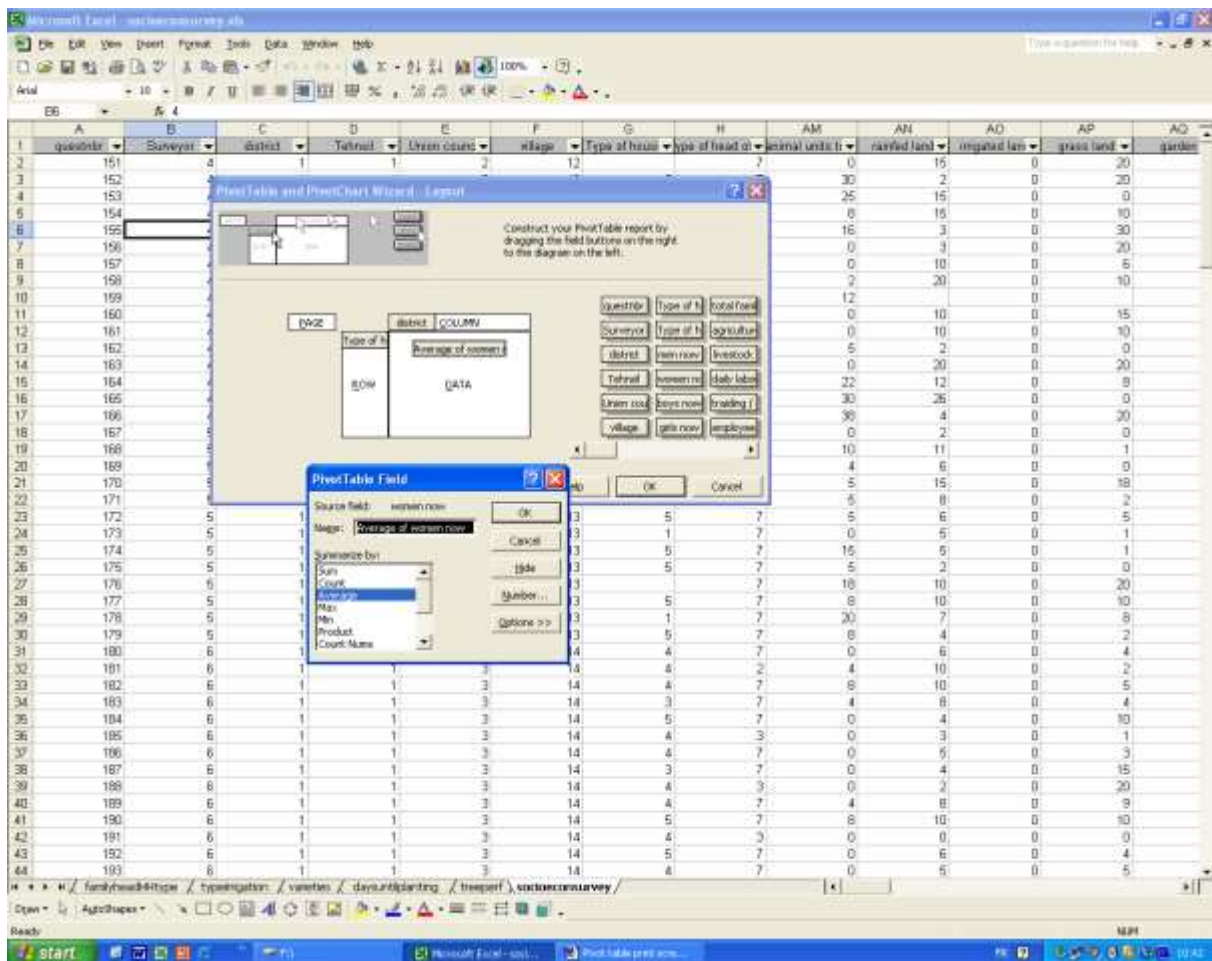
- There are three spaces to where the parameter boxes can be transferred: 1. heading of a column, 2. heading of a row, or 3. as data to be analysed in the central part of the table frame. In the space of columns or rows, the headings with two types of datasets can be transferred: 1. the differentiating parameters (one choice or selection out of a given list) which will split the analysed data in the centre into different categories of the selected parameters, or 2. Ranking parameters (where four categories are possible: poor, fair, good, excellent) in order to calculate the frequency of those categories. It is recommended to transfer only one of these parameters each time, otherwise the tables will become complicated for data interpretation. Therefore, for each of the differentiating parameters it is best to create a new table. Looking into the data within the various columns, there should be a significant difference compared to the overall results (last column or row in the table), to ensure that the selected differentiating parameter has an influence on the analysed data. Aside from transferring parameters into columns or rows, it is also necessary to transfer data into the central part as shown in Window 8. The parameters to be transferred will be mainly quantitative data, but also yes/no responses, or when the number of entries need to be counted, such data can be transferred as well.

Window 8



- Once a parameter has been transferred into the data section by double clicking on the same box, a small window pops up, as shown in Window 9, where the different possibilities of functions that data can be subject to or what statistical analysis could be done with the entries can be seen. Select one of the following options: sum, count (counts all types of entries and not only numeric once), average, maximum, minimum, product, count numbers (counts only numeric entries), and lastly four statistical options (two types of standard deviation or variance). These last four options are not really useful for the type of results needed for reporting.

Window 9



Depending on the result desired, the possibility exists to choose one of the above functions shown in Window 8. In case more than one function is needed it is necessary to transfer again the same parameter into the central part of the table and double click again on the box and select this time the other needed function.

Remember the options for the data analysis depending on the type of question explained in the previous questionnaire development phase.

For a Yes/No question, where Yes was entered as 1 and No as 0, the sum will give the number of the total entries of Yes responses. By comparing it with the total number of entries (count numbers), a percentage can be calculated.

The numeric entries resulting out of questions requesting quantitative information can be subject to the following functions: Max, Min and/or Average.

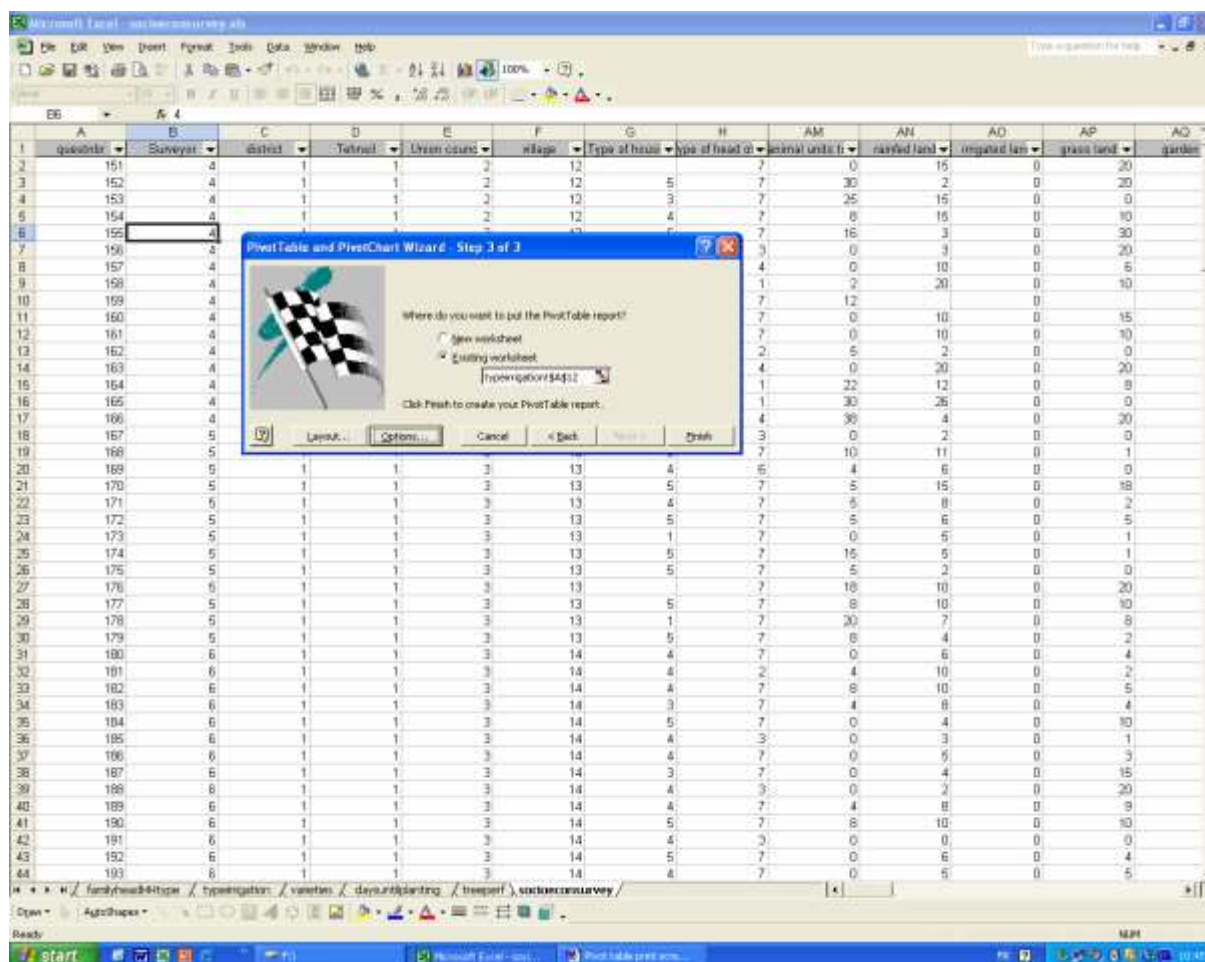
In addition, depending on the type of average which the user is expecting to calculate, some adjustments have to be made beforehand. Either calculates the overall average of a specific entry like debts (this takes into consideration also those households without debts as '0' has been entered into the dataset for those households without debts). If interested only in the average amount of debts from the households with debts all the '0' should be removed in the dataset under the debt amount column.

Finalize the part of creating the whole table with clicking on 'OK'.

It is always better to make several tables. This is easier later on for interpretation and would be more suitable for the establishment of graphs than a single table with too much information.

- Thereafter the same window reappears, shown in Window 10, from which the layout was selected. Check here as to where the results should be placed, either in a new or in an existing work sheet, if not already done. The best option is to choose each time a new worksheet to eliminate risk of overlapping or erasing previously created tables. Now click on the box 'finish'.

Window 10



- See in the following window the table of results shown in a simple Pivot Table, see Window 11.

Window 11

[illegible]

Based on these various tables created, it is now possible to make particular tables and graphs required for reporting purposes.

ANNEX 10: SEED BASICS

Introduction

A more technical understanding of seed parameters is useful background for SSA practitioners. This involves seeking answers to key questions such as: What are varieties of the crops that farmers are growing? What is meant by quality seed of adapted varieties? What are the components of National Seed systems? What is the difference between the formal and informal seed sector? What are the different sources of seed used by farmers and how is quality seed produced by farmers and seed enterprises? These are among the technical topics that will be explored in this section.

Preferred Crop Varieties

Key questions in a seed security assessment are: What are the crops and varieties that vulnerable households use and what are their essential characteristics? Are there seed quality problems associated with these crops/varieties? Are these traditional or improved varieties? What is the comparative view of farmers regarding improved and traditional varieties and how does this influence variety adoption? What are the crops and varieties that are available from the various seed sources? Are there improved crop varieties in the country that could be useful for vulnerable farmers or are these already used by the farmers? This section provides the technical background for practitioners to explore these questions.

Within crops species such as maize, rice or groundnut, there are thousands of distinct kinds of each crop, which are referred to as “varieties” or “cultivars”. Plants produced by seeds of a variety present the same characteristics, which are reproducible from one generation to another. The definition of a cultivar is a population of cultivated plants that can be clearly distinguished by any characteristic (morphological, physiological, cytological, chemical or others) and which, when reproduced (sexually or asexually), retains its distinguishing character.

“**Improved**” or “**modern**” varieties are the result of plant breeding and varietal development programmes, multi-location trials, national variety release systems and formal seed production systems. Other kinds of crop varieties are **traditional** varieties (also known as **landraces**) that are produced and conserved by farmers. They can be a local population of plants selected by farmers during many years. Sometimes traditional varieties are improved varieties that were released many years ago and are being maintained by farmers. *Normally a seed security assessment will reveal that farmers depend on traditional varieties and they often don’t have access to improved varieties.* Seed of different varieties of the same crop are often difficult or impossible to distinguish just by looking at the seed once harvested. This means that the mixing of different varieties of the same crop or species can occur when the grain/seed is sold and enters the formal and informal marketing system. *However some grain marketers or local seed sellers try to keep crop varieties separate to sell as seed at planting time and this is important to determine during a seed security assessment.* Plots that are planted with a mixture of varieties may have plants of different height and mature at different times, which may be a problem in harvesting and post-harvest handling, and results in lower yields. However, it must be pointed out that traditional varieties or landraces, particularly of cross-pollinated varieties used by subsistence farmers, are often populations of plants that are not very uniform. This heterogeneous character can be an advantage in some circumstances, such as low rainfall, low fertility, and pest and disease pressure.

For example, in Burundi, farmers prefer to plant bean seeds that are a mixture of bean varieties in order to cope with pest and disease problems or drought since each variety has different characteristics.

Characteristics that are important to farmers and need to be documented during the SSA

Preferred varieties must be adapted to the local agro-ecological conditions. The length (days) of the growth cycle is a critical characteristic in particular for rainfed crops to enable them to mature while there is sufficient moisture for grain filling. Adaptation to soil, soil fertility, diseases, pests, day length and moisture regimes are all important characteristics of a crop variety that farmers need. It is difficult to anticipate how a variety will respond to a different agro-ecological zone until it is actually grown there. Therefore, variety trials are important since they establish the recommended zones of adaptability for varieties. In drought conditions, although farmers may be interested in earlier maturing varieties, this is not always the best option. For example, bird attacks on the maturing grain of these varieties (rather than the conventional, longer duration variety) can be severe and discourage farmers from planting them. However, when early maturing varieties must be grown, there are varieties of some crops that are tolerant to bird damage which minimizes the effect of this pest, e.g. in rice and sorghum. For these varieties, it is also possible to delay the planting so that the maturity of the crops corresponds with later maturing varieties in order to diffuse bird damage over the entire crops of the area. It is also important to note that crop adaptation has a limit; it is wrong to believe that a variety can do well under all growing conditions. This should be kept in mind as we propose new varieties to farmers during emergency operations.

Farmer in Uganda have found their landraces of maize are not producing well because of the shorter rainy season and they require four months to mature. There are new maize varieties that mature in 100 days and they are interested in trying these varieties

A crop variety must have the right organoleptic properties. These properties refer to the processing, cooking, color and taste characteristics that are compatible preferences. Farmers have rejected many improved varieties because of poor taste or cooking and processing characteristics. Variety trials are often accompanied by cooking and tasting by women and men. In addition, aspects other than the edible grain may be important as the plant may be used for other purposes after harvest, such as the stalks for building material or fodder. Also, the choice of variety should take into consideration the crop architecture suited to local agronomic practices, particularly harvesting. For example, otherwise good dwarf varieties have been rejected because of the back-breaking nature of harvesting these, especially when the farmer's holding is large and there is no machine power available.

Farmers in the Oromia region of Ethiopia have adapted traditional sorghum varieties with long stems that are used for building material and animal feed but require six months to mature. When the early rains fail they look for short stature early maturing sorghum varieties to plant for the short rains.

Tolerance to pests and diseases (biotic factors) means that a plant can live with these organisms without significant loss of yield and quality. Obviously, tolerance to important diseases and pests is extremely important and a major objective of plant breeders. Tolerance and resistance can break down with time owing to mutations in the parasites or hosts. New sources of resistance and tolerance are always being sought by plant breeders. It is important to obtain precise information on disease and pest tolerance of a variety when considering the introduction of new crops and varieties.

In South Sudan groundnut is an important crop in many areas, however the rosette virus affects groundnut varieties and limits their yield. An improved rosette tolerant variety has been introduced that is very popular with farmers.

High yielding ability. This is linked to a range of plant characteristics, including plant architecture, nutrient-use efficiency, and factors mentioned above, i.e. adaptation to local conditions and pest and disease tolerance. Higher yields mean more food and income for farmers. With resource-poor farmers,

it is important that high yields be achieved under low input conditions (minimal or no fertilizer and pesticides), or with the use of organic or mineral soil amendments. However, emergency operations should not be used for providing untested new crop varieties to farmers. Observing good farming practices in terms of land preparation, sowing time, weeding, soil fertility management and water management, and avoiding post-harvest loss are important contributing factors for high yields.

In the Casamance region of Senegal traditional rice varieties are often tall and late maturing. Locally bred rice varieties that are earlier maturing and have more tiller per plant have been introduced that have increased yields under low input conditions.

Variety type

A significant technical aspect of seed relates to the way a particular crop is pollinated and whether it is self-pollinated or cross-pollinated. Basically, in self-pollinated crops, the male (stamen) and female (stigma) parts of the flower are very close together in the same flower, and due to physiological factors, such as the timing of the release of the pollen in relation to the receptiveness of the stigma, the plant will be self-pollinated. The result is that varieties of these crops are often more homogenous, they are not likely to be pollinated by pollen from other plants of the same variety or even from other varieties of the same crop in the next field or hundreds of meters away. This also implies that seed production by farmers of these crops is easier and requires less isolation from other cultivars of the same species to ensure that the seed will be homogenous. Examples of self-pollinated crops are rice, wheat, beans and tomatoes.

Cross-pollinated crops are characterized by plants in which the self-pollination is prevented by either mechanical, biological or other obstructions. Sometimes there are separate male and female flowers. In other crops, the pollen is released before or after the stigma becomes receptive on that plant. In this case, wind and insects are often important for pollination. It also means that there can be considerable cross-pollination between among different fields of the same crop, even up to a distance of half a kilometer or more. Insects can even cross-pollinate crops at even greater distances. As a result, these crops have the potential to be more heterogeneous and require large isolation distances from other crops of the same species to produce seed that is genetically homogenous. Through selection of plants for seed at harvest, farmers can maintain a degree of control over the next generation of seed. Examples of cross-pollinated crops are maize and cucumbers. Some crop species can have both types of pollination simultaneously; for example, millet and sorghum, which are mainly self-pollinated, have an out-crossing (cross-pollination) rate ranging of between 5–20 percent.

Hybrids are produced by the cross-pollination of unlike parents of the same crop. In very simple terms, parent plants are selected for certain traits and are self-pollinated for several generations to produce “inbred lines”. These inbred lines are then cross-pollinated to produce the F1 generation, which is known as a hybrid. Because the parents are genetically different, the F1 will have “hybrid vigour”, resulting in strong, vigorous plants and greater yield under good agronomic conditions. F1 plants are uniform. However, when an F1 plant is cross-pollinated with another F1 plant to produce an F2, it will not have the same characteristics as its parent plants; it will not have hybrid vigour, and in fact, it may grow very poorly and have poor low levels of vigour and yield. In addition, hybrids generally require higher levels of inputs, especially fertilizers, in order to have perform well in the field. Traditional farming practices often rely on farmers producing and saving seed for planting in the next season. Seeds produced from a hybrid seed should not be used as seed for the next season.

Open-pollinated varieties (OPVs) are varieties that have been generated from populations where all plants have had an equal chance of pollinating each other and themselves. The main characteristic of

these varieties is that they maintain a high degree of stability for several generations. This means that seed of OPVs can be saved by farmers for use over the next following seasons and the characteristics of the varieties will remain stable. Seed production of OPVs mainly requires to respect isolation distances, but it does not require the use of sophisticated pollination control methodologies and is therefore much simpler than hybrid seed production. Seed of hybrid varieties is generally much more expensive than seed of OPVs.

Variety types

Characteristic	Open pollinated	Self-Pollinated	Hybrids
Crop	Varieties or landraces of maize, sorghum, millet	Rice, groundnuts, wheat, beans, soybeans	Hybrid maize, some commercial vegetables
Production of high quality seed by farmers	Difficult: Needs isolation from pollen of other fields. Selection of best performing plants is possible but needs training on special seed production techniques (progeny test).	Easy: Minimum isolation necessary between fields. Easy to produce and to select best performing plants.	Difficult for farmers to produce since it requires isolation, inbred lines and controlled pollination.
Uniformity	Heterogeneous	Homogenous	Homogenous
Yield potential	Low	Medium`	High

As information on crop varieties is gather and seed security interventions proposed, consideration of the **variety types** needs to be included in order to assess the feasibility of the proposed action. For example, farmers can easily produce self-pollinated crop varieties but with hybrids they will have to buy the seed every year.

Seed quality attributes

An aspect of seed that is often overlooked is seed quality. Seed of low quality can have a negative effect on crop production and food security. The effectiveness of seed security interventions have sometimes been diminished by the provision of low quality seed to farmers. It is essential in seed security activities that vulnerable households receive the appropriate crop variety and good quality seed at the right time to improve their food security, rather than unknowingly contribute to food insecurity by providing poor quality seed.

There are three basic parameters for seed quality attributes:

- physical qualities of the seed;
- physiological qualities such as moisture content, germination, vigor, and varietal purity;
- seed health, which refers to the presence or absence of diseases and pests.

When seed has good physical, physiological, seed health attributes farmers have greater prospects of producing a healthy crop with improved yields. High quality seed is a major factor in obtaining a good crop stand and rapid plant development even under adverse conditions, although other factors such as rainfall, agronomic practices, soil fertility and pest control are also crucial.

Key questions in a Seed Security Assessment regarding seed quality are: Are vulnerable farmers experiencing seed quality problems with the seed they produce and save, or receive from other sources? Does the formal sector produce quality seed and what are the views of farmers regarding

the quality of formal sector seed in comparison with their own saved seed or other informal sector seed? Are there opportunities to improve seed quality so farmer can increase their food security?

SEED QUALITY ATTRIBUTES – PHYSICAL

Physical qualities of the seed are characterized by having the following:

- **A minimum of damaged seed:** Damaged (broken, cracked or shriveled) seed may not germinate and is more likely to be attacked by insects or micro-organisms. It is possible to eliminate most of the damaged seed during seed processing either by the farmers or a seed company.
- **A minimal amount of weed seed or inert matter:** Good quality seed should be free of weed seeds (particularly noxious types), chaff, stones, dirt and seed of other crops. Almost all these impurities can be discarded during processing by the farmer or seed producer.
- **Near uniform seed size:** Mature medium and large seed will generally have higher germination and vigor than small and immature seed. In the conditioning (processing) of seed, undersized and light seeds are normally eliminated and this can also be done by farmers through winnowing or hand selecting of seed.

Physical quality parameters such as seed uniformity, extent of inert material content and discolored seed can be detected by visually examining seed samples. Closely examining handfuls of seed is the first step to better understanding the quality of seed provided to farmers; it gives the first but not the only opportunity to decide on seed cleaning needs.

There are many ways that farmers can improve the physical quality of the seed through winnowing, use of screens and hand selection of seed.

SEED QUALITY ATTRIBUTES – PHYSIOLOGICAL

- **High germination and vigor:** The germination percentage is an indicator of the seed's ability to emerge from the soil to produce a plant in the field under normal conditions. Seed vigor is its capacity to emerge from the soil and survive under potentially stressful field conditions. The loss of a seed's ability to germinate is the last step (not the first step) in a long process of deterioration (gradual loss of viability). Decrease in seed vigor and other physiological changes occur before loss of germination. Therefore, seed with acceptable germination can be low in vigor.

The importance of physiological quality cannot be overemphasized. Seed can only fulfil its biological role if it is viable. Therefore, physically uniform seed of an adapted variety will be useless if it is low in germination and vigor, or if it fails to germinate when planted. The difference between grain and seed is that the former may or may not germinate, while the latter must germinate. This is why germination, particularly a high percentage of it, is such an important technical specification for seed.

Legumes such as groundnuts, beans or cowpeas are prone to rapid deterioration in germination and vigor during storage. Proper drying and storage conduction can help minimize deterioration in germination.

SEED QUALITY ATTRIBUTES – SEED HEALTH

Seed health refers to the presence or absence of disease-causing organisms, such as fungi, bacteria and viruses, as well as animal pests, including nematodes and insects. Ensuring seed health is

important because the diseases initially present in the seed may give rise to progressive disease development in the field and reduce the commercial value of the crop and diseased seed may introduce and spread diseases or pest into new regions. Seed health issues are particularly important for the vegetatively propagated planting materials because it is much easier for diseases to be spread through live planting material.

- Discolored or stained seed are symptoms of seed that may carry micro-organisms that have already attacked the seed or will attack it when it starts to grow. The plant may live and spread the disease to other plants.
- Seed health testing can be carried out in seed laboratories in order to assess seed sanitary quality.

The best way to avoid seed contamination by pests and diseases is to use proper seed production practices, i.e. to control pests and diseases during the seed production process. However, if a seed becomes infested with insects, then it can be fumigated. Some seed-borne diseases can be controlled or suppressed by the seed treatment during seed processing or just prior to planting. The use of seed treatment products is highly regulated at national and international levels and must be managed carefully. Special precautions need to be taken when treated seed is distributed to farmers.

The significance of seed quality makes it an essential element of seed security. It is necessary to understand if there are seed quality issues that are negatively affecting the seed security of vulnerable farmers and how the seed quality issues can be addressed.

What is the National Seed system?⁸

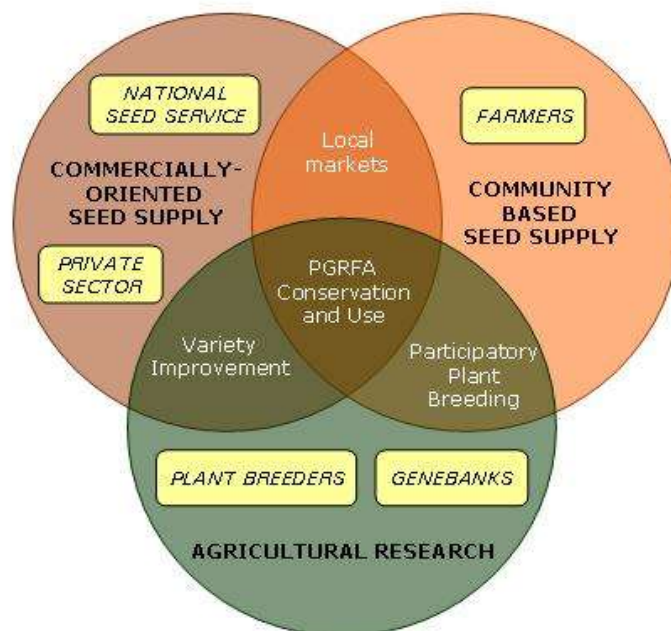
A seed security assessment includes the national seed system because this is the overall national context for seed security and interventions to improve seed security of vulnerable populations. National seed systems vary greatly among countries: some countries have strong formal seed systems with well-developed agricultural research, national seed service and local seed enterprises; others have weak formal seed systems with the informal seed system providing most of the seed used by farmers. Documenting the national seed system is an essential element in conducting a seed security assessment.

Key questions related to the national seed system are: What are the different components of the national seed system, their respective roles and relative importance? What are the source of seed of both traditional and improved varieties? How can seed sources of farmer preferred crops and varieties be improved for vulnerable households?

⁸ Seed In Emergencies: A technical handbook (FAO, 2010)

Figure 12: the national seed system

National Seed System



The national seed system can be conceptualized as three intersecting circles representing its main components: agricultural research as the source of improved varieties, the commercially-oriented seed supply (formal seed sector) for the production of certified seed by the government and seed enterprises and the community-based seed supply (informal sector) where farmers and communities produce, save and exchange seed.

Commercially-oriented seed supply (formal seed system): in Figure 12 above, the intersection of the upper left circle and the lower circle (“**Variety Improvement**”) represents the plant breeders in the private sector and/or in public research institutes or international institutions developing new crop varieties with desired characteristics, such as high yield, tolerance to pests and diseases, appropriate organoleptic (taste and cooking) characteristics for personal consumption and sale in the market. **Variety improvement** is essentially the output of agricultural research to the national seed system. After rigorous testing, the best new varieties are released through a national variety release system. The early generations of these released varieties are then multiplied by government seed services or the private sector with appropriate quality control by the **national seed service and or private seed sector** (in the upper left circle).

Later generations of the released varieties are multiplied by the seed enterprises under a quality assurance programme to become certified seed (in the formal sector seed or FSS) that meets specific quality standards. The seed is sold as certified seed to farmers through agriculture input supply stores, seed traders, government programmes, NGOs and in **local markets** (intersection of the commercial sector and farmer sector, top centre of Figure 12). Local market refers to all types of market linkages between producer and consumer/user. Therefore, it is in the local market where commercial seed and the farmer-produced seed may be present and this is local market seed (LoMS). In some countries, commercial seed is only available in input supply stores in the capital and major towns. In more remote

regions, the only seed available may be from weekly markets or from small traders. In local markets there may not be a clear distinction between food grain and seed for planting.

Community-based seed supply sector (informal/farmer seed system): this refers to the upper right circle in the figure, in which farmers use traditional methods to produce, process, store and exchange seed through social networks and save their own seeds for the following planting season. For most farmers, this is their primary source of seeds, also called own saved seed (OSS). In the farmer seed system, farmers have various sources besides what they produce and include social networks, local markets, seed enterprises, government, and NGOs. Farmers value their seed, which has been passed down through generations. This system includes the selection of plants at harvest time or during storage. Selected grain to be used as seed is often stored separately from other food-grain and cleaned before planting. Seeds that farmers plant are usually from varieties that are well adapted to their agro-ecological zones and have the desired characteristics for consumption and/or sale as seed or food-grain. However, the increasing incidence of drought, flood, pest and disease attack means that farmers often seek new varieties to address these problems.

Conservation and use of Plant Genetic Resources for Food and Agriculture (PGRFA) (intersection of all three circles in the centre of the figure) refers to the commercial sector, agricultural research and the farmer, and the means by which local landraces are conserved in gene banks and by farmers in their fields, and are used for developing new crop varieties. The local landraces can be the basis for development of new varieties through crossing them with exotic germplasm. Farm families plant a diversity of crops and often several different varieties of each crop in a wide range of agro-ecologies. Farmer seed production systems are often specific to each crop. Farmer seed systems also include the introduction of new materials that come from social networks, communities, markets, seed companies, extension workers and NGOs. Therefore, **PGRFA conservation and use** is extremely important for vulnerable farmers as well as the commercial sector. PGRFA include both the local and introduced crop diversity that are so important to a country's agriculture sector.

When farmers are involved in variety development by providing feedback on new varieties to plant breeders, this is referred to as **participatory plant breeding (PPB)** (intersection of the lower circle and upper right circle). In PPB, improved varieties developed by agricultural research are tested both in research plots and on farmers' fields at an early stage in the process of selecting new varieties.

Relationship of the formal (commercially oriented) and informal (community based) seed systems

The roles of the commercially-oriented seed supply and the community-based seed supply can vary by crop, region of the country, importance of the crop for food and for cash, as well as other factors. For example, in many countries in eastern and southern Africa, there is a commercially-oriented seed supply for important cash crops such as maize. However, for other important food crops such as sorghum, millet or beans the commercial seed sector in the same countries may not be well developed. The **commercially-oriented seed supply component** of the national seed system operates with the seed policy and national seed legislation, and phytosanitary regulations of the government.

In developing countries, the formal seed system (commercially-oriented seed supply sector) may not reach the small-scale farmers, and new, improved varieties are often not adapted to their needs owing to low input production practices and diverse agro-ecologies. In addition, these varieties are often more vulnerable to drought or environmental stresses and do not meet organoleptic requirements. Until new improved varieties of certified seeds are demonstrated in small-scale farmers' fields, it cannot be assumed that they are adapted to farmers' needs. However, improved varieties that have undergone testing by small-scale farmers can prove to be a welcome addition to their diverse crops and varieties.

Characteristic	Formal Sector Seed Certified or truth in label seed	Informal Sector Seed or farmers seed sector
Origins of crop variety	Public research institutes or private breeding, National or Foreign.	Traditional Landraces. Varieties from formal seed sector multiplied with no genealogy or varietal purity control (attention to multiplication of F1 hybrids)
Source of Seed	Input dealers/seed sellers often not in local markets. Emergency interventions with direct distribution of seed.	Farmers, Social networks, local markets
Seed Quality	Seed lot has passed a Quality control system. However it depends on the reliability of the system and/or the storage conditions.	Variable, depends on seed production and saving practices
Cost of Seed	High cost	Low cost, barter or gift

In the context of a seed security assessment it is important to analyze both the formal and informal seed sectors in order to understand their current status and their roles in providing seed for vulnerable farmers in the affected area. The impact of the crisis on the seed systems and the availability of seed for farmers need to be understood. For example when there is a crisis farmer/community-based seed systems can be impacted and vulnerable farmers turn to other sources of seed such as social networks, local markets, NGOs, seed traders and the government to replace their seed stocks. It is the changing seed supply situation and the means of the vulnerable households to obtain the seed that must be examined in a seed security assessment in order to determine the best strategy to address the seed insecurity in a way that will strengthen and not weaken the seed system.

ANNEX 11: LINKING DISASTER TYPE TO SPECIFIC SEED SECURITY PROBLEMS: INSIGHTS FROM AFRICA

Disaster or other stress	Features with the potential to undermine seed security	Seed security constraints most often uncovered	Insights from field experience
Drought	<ul style="list-style-type: none"> Harvest may be lower than usual but only in rare cases will there be a total failure. Seed sharing may decrease due to seed scarcity. There may be asset losses due to reduced harvest. 	Access problem: some depletion of farmer assets.	Droughts are by far the most common trigger justifying DSD, particularly in southern Africa. However, evidence from the field shows that even with sharp declines in harvests, enough seed for planting is usually available from both home production and markets. This is typical of drought-prone areas where small-seeded crops such as sorghum or pearl millet predominate.
Plant disease	<ul style="list-style-type: none"> Harvest may be reduced or a total failure. Local crops and varieties may not be adapted to the disease. Local seed production channels may not be able to immediately provide adapted varieties. Seed sharing may decrease due to seed scarcity. There may be asset losses due to low or no harvest. 	Varietal suitability problem: Varieties no longer adapted to local conditions.	<p>The challenge with plant disease is to identify something that will grow under changed production conditions (in contrast to drought, where production conditions are stable). Also, finding enough resistant material may demand widespread seed multiplication efforts.</p> <p>Example: parts of eastern and central Africa have been confronting crises and related seed-quality problems since the late 1990s with waves of CMD in cassava and a build-up of root rots in bean crops.</p>
Plant pest	<ul style="list-style-type: none"> There may be total crop failure, even across crops. Seed sharing may decrease due to seed scarcity. There may be asset losses due to low or no harvest 	Varietal suitability: Variety no longer adapted to local conditions	<p>Seed security issues will vary by type of pest and extent of pest damage. Locust damage, which is not crop-specific, may be extreme, affecting various crops, and even trees, bushes, and grass (possibly affecting livestock forage supplies). Locust, however, do not have lingering effects. They strike, destroy, and then disappear.</p> <p>Example: West Africa, for instance, has had waves of locusts: Northern Mali, attacked in 2004, resumed relatively normal crop production by 2005 (although it suffered droughts in between).</p>
Flood	<ul style="list-style-type: none"> Harvest failure may be total (crops wiped out). Fields might be significantly damaged or destroyed. There is the possibility of population displacement. Local seed production channels may not be functioning. 	<p>Availability problem likely; also, the required conditions for planting (arable fields) may not be in place.</p> <p>Prime problem might be extensive asset loss.</p>	<p>Problem of seed availability would normally be associated with floods.</p> <p>Example: however, in Mozambique, a highly flood-prone country, the government promoted seed vouchers and input trade fairs shortly after 2000, moving seed from one agro-ecological</p>

Disaster or other stress	Features with the potential to undermine seed security	Seed security constraints most often uncovered	Insights from field experience
	<ul style="list-style-type: none"> • Social relations generally remain the same but could change if families end up in camps for internally displaced persons (IDPs). • Markets, roads, and other infrastructure could be significantly disturbed. • There may be significant losses of assets (seed, livestock, and houses). 		<p>zone to another. That response puts the focus on 'access' constraints.</p> <p>Depending on the source of the flood water, soil issues (i.e. leaching, erosion) may need to be addressed before planting.</p>
War (quick onset, short and intense, staggered over zones)	<ul style="list-style-type: none"> • Harvest are lower than usual, but only rarely a total failure. • Perhaps no forced population displacement, although massive fleeing by some portions of the population. • Seed sharing may decrease due to ruptured social relations and seed scarcity. • Local seed production channels may (or may not) be functioning. • Security might be compromised, restricting agricultural work or use of public resources such as markets. • Assets losses due to small or no harvest (as when fields are abandoned). 	<p>Depends on nature of war:</p> <p>Could be problems of availability and access, or neither.</p> <p>Issues of protection could be key. Does one provide inputs to households if this might put them in danger?</p>	<p>Seed security problems encountered greatly depend on the specifics of conflict (onset, duration, extent, intensity).</p> <p>Example: before war and genocide in Rwanda in the 1990s, many farmers had come to rely on formal sector channels for clean potato seed and new varieties. These arrangements broke down early in the conflict as government services retrenched and development projects pulled out. In contrast, local markets, the main source of beans, continued to diffuse bean seed during some of the worst events. So while potato production virtually collapsed, relying as it did on the formal sector, bean seed channels, which were based on local farmers' systems, continued on course for the most part.</p> <p>In the case of potatoes, there was a seed availability problem. For bean seed, the constraint was solely access. Note also the ruptures in social networks of 'seed sharing' were not a key factor. This is because the giving of seed was not part of Rwandan farm culture even before the crisis.</p>
War (Chronic conflict)	<ul style="list-style-type: none"> • Fields may not be planted, particularly if farmers are in IDP camps or if an area is insecure. So there may be total failure of production. • People may become displaced. • Social relations may change in IDP camps or, depending on root causes of the conflict, but may remain the same. 	<p>Depends on nature of war:</p> <p>Could be problems of availability and access, or neither.</p> <p>Quality, particularly variety quality, could be a problem should population move to</p>	<p>It is difficult to generalize about longer-term conflict.</p> <p>A 'war' is rarely homogeneous, with conditions often in flux.</p> <p>Example: Darfur in 2008 is a good example. There are areas that move into and out of use over time, and different issues must be addressed in different places.</p>

Disaster or other stress	Features with the potential to undermine seed security	Seed security constraints most often uncovered	Insights from field experience
	<ul style="list-style-type: none"> Local seed production channels may (or may not) be functioning Infrastructure may be disturbed or may remain intact. Markets function in secure areas only. Asset loss is likely to be severe. 	<p>new agro-ecological zones.</p> <p>Issues of protection could be key. Does one provide inputs to households if this might put them in danger?</p>	

Source: Sperling (2008)

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