

# Rapid Seed System Security Assessment in the *Belg* Growing Areas of Amhara, Oromia, SNNPR and Tigray Regions of Ethiopia



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## ACRONYMS

ASE	Amhara Seed Enterprise
ATA	Agricultural Transformation Agency
BoA	Bureau of Agriculture
CRS	Catholic Relief Services
DRMFSS	Disaster Risk Management and Food Security Sector
EIAR	Ethiopian Institute of Agricultural Research
ESE	Ethiopian Seed Enterprise
FAO	Food and Agricultural Organization of the United Nations
FCU	Farmers' Cooperative Unions
FGD	Focus Group Discussion
FSS	Formal Seed Sector
ISSD	Integrated Seed Sector Development
KII	Key Informants Interview
LM	Local Market
MARC	Melkassa Agricultural Research Centre
MLND	Maize Lethal Necrosis Disease
MoANR	Ministry of Agriculture and Natural Resources
NARS	National Agricultural Research System
OSE	Oromia Seed Enterprise
PHE	Pioneer Hybrid Ethiopia
QDS	Quality Declared Seed
REST	Relief Society of Tigray
RFB	Regional Finance Bureau
SSCF	Seed Security Conceptual Framework
SSE	Southern Seed Enterprise
SSSA	Seed System Security Assessment

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## SUMMARY

Seeds and/or planting materials are the basic inputs in agricultural production, and are a central part of farmers' life in Ethiopia. Seed security provides the opportunity for increasing productivity and the production of crops, and subsequently contributes to improving food security. The 2015 government-led multiagency mid-year Humanitarian Requirement Document<sup>2</sup> revealed that inadequate rainfall was received in almost all *belg* crop producing areas of the country, and this contributed to a rapid deterioration of the overall food security situation. With a significant reduction in production across the most recent two consecutive seasons, an estimated 10.2 million people have been affected and are in need of emergency assistance.<sup>3</sup> There is, however, insufficient information on the impact of the 2015 drought on seed security situation in the affected areas.

CRS has conducted this Rapid Seed System Security Assessment (SSSA) with the overall objective of understanding the seed systems, constraints and opportunities in the *belg* growing areas. The assessment specifically focused at assessing the seed security situation, establishing seed requirements for the major crops produced in the drought affected *belg* growing zones and woredas, and providing information that helps in developing and/or redesigning seed intervention plans, projects or programs.

Participatory methods were used to collect qualitative and quantitative (minimal amount) data from the Federal Ministry of Agriculture and Natural Resources (MoANR) and Regional Agricultural Bureaus, National Agricultural Research System (NARS), public and private seed enterprises and their agents, agro-input dealers and local grain market traders, Farmers' Cooperative Unions (FCUs) and primary cooperatives and drought affected community members. Primary data was collected from across four regions (Amhara, Oromia, SNNPR and Tigray) covering 10 zones and 17 *belg* growing woredas. The most affected woredas and kebeles were purposely selected. Overall, discussions were held with 125 key informants and 17 Focus Group Discussions (FGDs) were conducted consisting of 363 community members, of which 29% were female. Data was triangulated from different sources and qualitative and quantitative techniques of data analysis were used.

Data analysis showed that the major crops grown by households in the assessed zones during the *belg* season include maize, barley, wheat and tef, haricot beans, potato and sweet potato. Maize and haricot beans are widely grown across the assessed woredas of Oromia, SNNPR and Tigray regions, while barley is predominant in the highlands of Amhara and some parts of Oromia regions. The other crops are either zone or woreda specific. Planting of *belg* crops is done from mid-January through March, with significant variations in cropping practices, average land area and seed rates across zones.

The *belg* crop performance was considered poor in 2015 compared to normal years, with production losses ranging from about 45% to 99%. Similarly, the *meher* season production loss was estimated at 25% - 96% across the zones visited. These were attributed to the late start, poor distribution, insufficient amount and early cessation of rains experienced in the affected areas of the four regions. Other factors such as floods, hailstorms, pest and diseases, and frost in the highland areas aggravated the situation.

The assessment revealed that in 2015, about 72.2% of the farmers in the areas studied sourced seed from the informal sector, with the majority of them sourcing from local markets (31.4%), followed by "own-saved" seed (28.4%), and seed obtained through social networks (9.7%). About 77.5% of farmers sourced their haricot bean

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<sup>2</sup> Ethiopia Humanitarian Requirements Document [HRD] Mid-Year Review 2015

<sup>3</sup> Ethiopia Humanitarian Requirement [HRD] - December, 2015

seed from the local market, while some 56% and 38.6% respectively bought wheat and barley from the local market. Own-saved seed was the major source of barley and tef seed in 2015 for many households, with up to 40% and 30% of the farmers respectively depending on this source. About 27.2% of the farmers sourced seed from the Farmers' Cooperative Union (formal sector) which was an important source of wheat and maize, for about 44.0% and 53.2% of the farmers respectively. In 2016, smaller proportions of the farmers are expecting to use seed from informal sources due to the loss of *belg* production and the significant reduction of *meher* production in 2015. As a result, up to 33.3% of the farmers are expecting seed assistance. The informal sector is expected to serve less than half (35.6%) of the number of farmers it served in 2015, thus leading to a significant reduction in the proportion of farmers who will use own-saved seed (-23.0%) and local markets (-11.6%) as a source of seed. This change in seed source signifies the limited availability of own-saved seed, and a possible reduction in the supply or increase in grain/seed prices on the local market in the assessed woredas.

In terms of seed availability, over 140,051 tons of major cereals, 6,000 tons of major pulses, 884 tons of potato and 29.5 million cuttings of sweet potato will be potentially<sup>4</sup> available from the intermediate and formal sectors nationwide. This could potentially contribute up to 21.5% of the national seed required. The available seed would enable planting an area of maize that is 61.2% of that planted in 2014, wheat at 35.7%, tef at 19.5%, while haricot beans (7.4%), barley (4.5%) and the other major *belg* can be covered in even smaller proportions. This implies that with the limitations of the formal sector, farmers and seed emergency response organizations will have to rely on informal sources for many crops including tef, haricot beans, barley, potato and sweet potato. For the 2016 *belg* and *meher* seasons, access to seeds could be the major limiting factor for farmers due to the poor harvests in 2015, limited disposable assets, constrained social capital, and a lack of credit and financial services among the affected households. Some people contacted perceive that seed coming from the *meher* harvest could be of poor quality as a result of poor grain filling, which could result in poor germination. Field observations revealed mixed results, with some fields having poorly filled grains while pockets of fields could produce grains that could be used as seed. The seeds from different existing sources vary in quality. Formal seed sources are considered to be of good quality, followed by farmer-saved seed in terms of quality, while seed obtained from social networks is generally considered to be of medium to good quality. Seed from local markets is of the lowest quality due to a mixing of varieties, sometimes including weed seed. Some farmers expressed concerns regarding the adaptability of a few of the improved varieties (for example, Kobo Girana Sorghum variety).

The proportion of seed insecure households in the areas studied is high, which leads to high seed requirements. Triangulating data from multiple sources, the assessment team concluded that the overall requirement for the emergency seed response in the 21 assessed woredas is estimated at 6,316 tons of seeds for major cereals, 1,941 tons of haricot beans seed, 8,087 tons of potato tubers, and about 231 million cuttings of sweet potato. Participants in the FDGs reported that 55% - 90% of farmers are seed insecure. Woreda level officials and experts reported a range of 28% - 86% of the households in the affected *belg* growing areas are seed insecure, meaning they have no access to seeds. The major drivers of this high level of seed insecurity include: the severe impact of the drought on production during the two consecutive seasons negatively impacted seed availability from the informal sector; several re-plantings during the *belg* and *meher* seasons resulted in exhaustion of farmer-owned seed stock; and low levels of disposable capital assets and progressive increases in the prices of seed have limited households' ability to access to seed. Critical challenges in addressing seed insecurity include the inadequate supply of seeds of some crops from the formal sector, weather related changes such as erratic rainfall, pests and disease, restrictive guidelines on seed sourcing from the informal sector for emergency response, and untimely seeds delivery by governments and other emergency seed actors.

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<sup>4</sup> Potential availability recognizes quantity, but consider that the available quantity is not yet in close proximity to the farm households, and need to be there in time for planting

These findings and challenges require that action be taken. Given the poor performance of crops in the last two consecutive seasons, the expected reduction in the amount of seed that will come from the informal sector, and the limited capacity of farm households in the drought affected woredas and kebeles, emergency seed support is inevitable.

The immediate actions involved in a seed response need to target the most affected woredas, kebeles and farmers. There is a need to provide short maturing varieties of the major crops grown in the *belg* season by considering their adaptability to the given agro-ecology zone. For emergency responses, it is recommended to source seed from both the formal and informal sectors based on availability and depending on the local situation, number of crops and choice options, and to use either a voucher or direct distribution method to deliver seed. It is also recommended to supply complementary inputs such as fertilizers and pesticides along with seed or to facilitate farmers' access to inputs.

In the medium to long terms, government and development partners should consider the following: promoting community based seed production; creating linkages with cooperative unions and the private sector; supporting investment in small-scale irrigation facilities; promoting crop and varietal diversification; promoting seed insurance schemes; promoting climate smart agriculture; and studying, and possibly supporting, the recently created disaster risk reduction reserve fund. These suggestions will be examined in more detail later in this report.



## 1.0 INTRODUCTION

### 1.1 Background

Seeds and planting materials are the basic inputs in agricultural production, and are a central part of farmers' life in Ethiopia. Seed security provides the opportunity for increasing productivity and production of crops, and subsequently contributing to improving food security. Food and seed security are inter-related, but are not the same, as one may have enough seed to plant but no food to eat, or vice versa. Therefore, those factors that affect the food security of farming households may directly or indirectly affect seed security.

The 2015 government-led multiagency mid-year Humanitarian Requirements Document <sup>5</sup> revealed that inadequate rainfall was received in almost all *belg*<sup>6</sup> crop producing areas of the country, and this contributed to the rapid deterioration of the overall food security situation. The onset of the *belg* rains was delayed, followed by intermittent rains and unusually long dry spells. These led to repeated planting across the *belg* growing areas of the country, with significant reduction of the production and productivity of crops. The area planted in the *belg* season was significantly lower than that of the average of the last five years, with estimates ranging from 25% to 55% in the southern *belg* producing areas and 50% to 58% in the northern *belg* producing areas, with production losses reaching as high as 99% in some areas.<sup>7</sup> In these areas, the pre-harvest assessment report indicates reduced *meher*<sup>8</sup> production due to missed long-cycle high-yielding crops and below-average and delayed rains. With poor rainfall performance and subsequent poor harvest across the two seasons, an estimated 10.2 million people are affected and in need of emergency assistance.<sup>9</sup> This number is expected to increase in the near future as farmers deplete their little stock from *meher* harvest.

The pre-harvest crop production assessment normally gives emphasis to production performance and its implications on food security but does not give sufficient attention to the impact of drought on the seed security situation of farmers in the affected areas. The rapid seed system security assessment was aimed at filling the gap to complement the 2015 pre-harvest crop production assessments and other food security related assessments.

### 1.2 CRS and Partners' Preparedness

The rain for the upcoming 2016 *belg* season is likely to be near average<sup>10</sup> and CRS Ethiopia is preparing to support farmers to capitalize on the rains and recover from the effects of the two consecutive failed seasons and subsequent poor harvests. With this in mind, CRS is designing a recovery seed response program for *belg* producing woredas to be implemented through local partners. The project intends to provide agricultural recovery planting materials, primarily seed of major crops, to communities in 37 *belg* growing woredas between January and March 2016. The project targets the poorest of the poor in the affected areas.

In order to better inform seed recovery programs for the *belg* production season in 2016, this report provides insight into the current seed security situation based on the assessments carried out in selected *belg* growing

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<sup>5</sup> Ethiopia Humanitarian Requirements Document [HRD] Mid-Year Review 2015

<sup>6</sup> *Belg* planting season - January to March, depending on the crops

<sup>7</sup> Ethiopia Humanitarian Requirements Document [HRD] Mid-Year Review 2015

<sup>8</sup> *Meher* planting season - April to September, depending on the crops

<sup>9</sup> Ethiopia Humanitarian Requirement [HRD] - December, 2015

<sup>10</sup> Gideon Galu, Yakob Seid and Chris Shitote, ETHIOPIA: 2015/16 El Niño Brief, USAID Mission – Addis Ababa, December 9, 2015

areas of Amhara (North Wello, South Wello, and North Shewa Zones), Oromia (East Hararghe, West Hararghe, and West Arsi Zones), SNNPR (Wolaita Sodo, Kambata-Tembaro and Hadiya Zones) and Tigray (Southern Tigray zone) Regions.

### 1.3 Objectives of the assessment

The overall objective of the rapid SSSA was to understand the seed systems, constraints and opportunities in the *Belg* growing areas. The specific objectives of the Rapid Seed System Security Assessment were to:

- a) assess the current seed security situation (availability, access, quality and varietal suitability) among farming communities within different agro-ecological zones and determine whether there is acute seed insecurity;
- b) establish seed requirement for major crops produced in the *belg* season, and outline roles and responsibilities of key actors in the seed system;
- c) produce recommendations for addressing the acute seed insecurity and needs of the communities in question in preparation for the upcoming *belg* season; and
- d) provide information that helps in developing and/or redesigning seed intervention plans, projects or programs for the affected communities in the short and medium/long terms.

## 2.0 SEED SYSTEM IN ETHIOPIA AND SEED SECURITY CONCEPTUAL FRAMEWORK

This section discusses seed systems in Ethiopia, and the major actors and their roles in the seed supply chains. It also looks into emergency seed policy guidance and provides the conceptual framework for analyzing seed security in emergency, rehabilitation and development context.

### 2.1 Seed Systems in Ethiopia

A seed system is the sum of the physical, organizational and institutional components, their actions and interactions that determine seed supply and use in quantitative and qualitative terms, and can be loosely divided into formal and informal sectors (Thompson and Scoones, 2012). The seed system in Ethiopia represents the entire complex organizational, institutional, and individual operations and interaction associated with the development, production, processing, storage, distribution, and marketing of seed in the country. Farmers, particularly smallholders, access seed through multiple seed sources within three systems in Ethiopia: formal, intermediate and informal seed systems.<sup>11</sup> These systems operate simultaneously and interact at different levels. The formal system is the origin of improved seed varieties in both the intermediate and informal systems. The intermediate system (community based seed production, processing and distribution through cooperative unions and seed grower groups) is a blend of formal and informal systems. Though not well developed, a few commercial private seed producers are also operating in the country as part of the formal system.

#### 2.1.1 The formal seed system

The formal seed system is regulated, from breeding through production, processing and marketing, with emphasis on quality assurance of traceable varieties. The major actors within the formal system are: the National Agricultural Research System (NARS) which includes the Ethiopian Institute of Agricultural Research (EIAR), Regional Agricultural Research Institutes (RARIs) and Universities responsible for variety development and supply of initial seed (breeder, pre-basic and basic seeds); and seed enterprises such as the Ethiopian Seed Enterprise (ESE), Oromia Seed Enterprise (OSE), Amhara Seed Enterprise (ASE) and South Seed Enterprise (SSE). The formal seed system also includes private seed companies such as Pioneer Hybrid Ethiopia (PHE), which specializes in hybrid maize seeds, and private firms producing hybrid maize seed and other crop varieties. The seed enterprises play major roles in the production of basic and certified seeds of improved varieties targeting various agro-ecologies in Ethiopia. All actors have inter-dependent roles within the system and the inefficiency of one actor can negatively affect the performances of the rest of the actors.

The formal seed system is supported by government institutions which are involved in regulatory and inspection processes. The Ministry of Agriculture and Natural Resources (MoANR) is the major regulatory body while crop protection and seeds laboratories undertake the seed inspection and certification services. The MoANR provides the legal and regulatory frame work for variety release procedures. The MoANR and regional Bureau of Agriculture also oversee multiplication, certification, inspection, estimation of seed demand, and allocation and distribution of seeds to regions, zones and woredas. Institutions such as Intellectual Property Rights and Standards Agency and law enforcement are also important institutions for effective functioning of the formal seed system.

*Seed demand estimation:* In Ethiopia, seed demand estimation is done by Regional Bureau of Agriculture (BoA), through the zonal and woreda offices. The estimation is normally based on the area under cultivation by crop and

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<sup>11</sup> Ayana, *et al.* (2014)

seed rates that Development Agents (DAs) collect from farmers. Once this is done, the estimate is submitted to the regional BoA that reviews and makes final allocation of seed to zones and woredas.

*Seed distribution:* This is done mainly by the seed enterprises, Farmers' Cooperative Unions (FCUs), and to a limited extent by the agents of the seed enterprises across the country and a few agro-input dealers in some locations. The seed allocated to FCUs is distributed or sold to farmers through the primary cooperatives and/or woreda agricultural office.

### 2.1.2 Intermediate (semi-formal) seed system

This system includes a nascent intermediate system centered on community-based seed production (CBSP). The system receives support from the NARS, Universities, Non-Governmental Organizations (NGOs), and seed development programs such as the Integrated Seed System Development (ISSD) Programme, and regulatory oversight from the BoA<sup>12</sup>. The new guideline for quality-declared seed enables community based seed producers to channel the seed into the formal system. The seed distribution channel of this system includes community based seed production by organized farmers in the form of cooperatives, model farmers, and/or individual entrepreneurs.

### 2.1.3 Informal seed system

The informal seed system is called so because it is non-regulated. It covers methods of seed selection, production, and diffusion by farmers. Seed is usually produced and selected from normal grain production activities; selected and saved/stored for next planting; exchanged/bartered or given as gifts between farmers and/or sold/bought in the local market.

In Ethiopia, the informal system accounts for about 90% of the seed used by smallholder farmers<sup>13</sup>, though significant proportion of maize seed (40% - 50%) used by the farmers comes from the formal sector. Millions of Ethiopian farmers still depend on the informal system due to its relatively cheaper price and ready availability, within reach at the time the seed is needed.

## 2.2 Seed Regulation and Guideline

The MoANR's seed regulatory directorate has developed guidelines/manual for emergency seed responses. The emergency seed response guideline requires that seeds should be procured from identifiable or traceable sources and be inspected and approved by an authorized body in the region. The guidelines outline sources of seeds and quality requirements. As per the guidelines, grains harvested from fields planted with the objective of producing seeds, but rejected during inspection, should be re-evaluated and could be used as seeds for the coming *belg* season.

The seeds guideline also requires that seeds for emergency responses should be from a registered and known variety, free of disease, not mixed with other varieties, and should be of known origin and year of production. In terms of quality, it should meet the minimum standards established for emergency seed response outlined in Table 1 below.

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<sup>12</sup> MoANR and ATA (2013)

<sup>13</sup> Asnake et al. (2012)

Table 1: Minimum requirement for the following emergency crop seed certification

Crop type	Purity (%)	Infection/infestation (Max %)	Germination (%)	Moisture content (max %)
Haricot bean	93	0.4	85	12
Chickpea	-	0.4	85	12
Mung bean*	93	0.4	85	12
Wheat	95	0.1		13
Soya bean	93	0.2	70	12
Sesame	97		85	8
Lentil	93	0.4	85	12
Maize**	95	0.1	85	13
Barley	95	0.1	80	12.5
Sorghum**	97	1	75	12
Tef	-	1	80	11

\* Lentil standard is used for mung bean; \*\* Open pollinated maize and sorghum; Sources: MOANR

When grain produced for food is used for seed, it should be from known sources and be free from pests and diseases and be of a pure variety that is not mixed. Possible sources are state farms, cooperatives, large commercial farms and individual farmers.

Procurement of seed from different sources require fulfillment of a set of minimum criteria. These include physical appearance of the seeds (fully filled, non-shriveled, unbroken, and not mixed with inert material and/or other varieties), cleanness (or will be cleaned if not clean), and acceptable germination percentage (through testing to establish germination levels). The seeds to be procured should be properly labeled, indicating the origin and source (vendor) of seed. Practical application of the guidelines under an emergency situation may be challenging when the farmers' production has failed and limited seed is available from the formal seed system.

## 2.3 Seed Security Conceptual Framework

According to FAO (2013), household seed security is 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. According to Sperling (2008)<sup>14</sup>, farm families are 'seed secure' when they have access to seed of adequate quantity, of acceptable quality, and in time for planting. Here, seed is broadly defined to include not just grains that are sown, but also cuttings, tubers, and other agricultural planting materials.

The Seed Security Conceptual Framework (SSCF) consists of four distinct elements: Availability, Access, Quality and Varietal Suitability (Table 2). Therefore, seed insecurity exists when any of the above aspects is significantly constrained. Knowing which particular elements of seed insecurity are present is critical for designing appropriate interventions.

<sup>14</sup> L. Sperling (2008), "When Disaster Strikes"

Table 2: Seed security conceptual framework: elements, definitions and indicators

Elements	Definition	Indicators
Availability	Seed supply from one or more sources (formal, intermediate and/or informal) that is sufficient enough to meet seed needs of farming households within a defined geographic area at planting time.	a) <i>Quantity</i> – Seed should be sufficient (enough) to meet the planting need of all farmers. b) <i>Proximity</i> – Seed should be within reach of all farmers. c) <i>Timeliness</i> – Seed should be available in time for planting.
Access	The ability and willingness to acquire seed through cash purchase, exchange, loan, barter or use of power in social networks.  Whilst seed may be available from alternative sources, it may not be easily accessible by all farm families, especially when they have no or limited resources and poor access to credit.	a) <i>Seed prices</i> – high price could limit farm family from accessing quality and quantity of seed they need. b) <i>Disposable assets</i> – this may include livestock, harvest from annual and perennial crops that the farmers may derive income from. c) <i>Social capital</i> – ability to borrow; receive gift and remittances from other members of the society. d) <i>Access to credit</i> – presence of financial services could enable farm households access credit.
Seed quality	Capacity of the seed to establish good crop under normal growing conditions. Seed quality includes a number of seed attributes or indicators.	a) <i>Germination</i> – ability of seed to sprout and grow into a normal seedling within a specified duration. b) <i>Analytical purity</i> – the extent to which a given seed lot has other crop seed, weed seed, broken seed, and the in heart matters. c) <i>Varietal purity</i> – the extent to which a given variety is mixed with other varieties of the same crop. This may or may not be of concern to farmers. d) <i>Seed health (Phytopathological)</i> – the extent to which a given seed lot or source has pests and/or seed borne diseases.
Varietal suitability	The extent to which crop varieties are adapted to local farming conditions (soils, rainfall condition) and practices (intercropping), as well as social acceptability (having traits preferred by the farmers).	a) <i>Adaptability</i> – performance (growth & yields) of given variety within a range of agro - ecological zones. b) <i>Preference</i> – meeting end users' needs (e.g. food, fodder, feed, value addition, market, etc.) of the farmers

Source: FAO (2015)

*Seed system resilience:* 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.



### 3.0 ASSESSMENT METHODOLOGY

The rapid SSSA entailed collecting and analyzing data that provides a better understanding of the seed security situation, as well as provides possible options for seed interventions in support to the seed insecure households/communities in the drought affected areas. A participatory rapid data collection methodology was used, and the strategic approach included triangulation of information from various sources in order to ascertain the validity of the data and information collected. Rigorous data analysis and interpretation of the findings was employed in order to provide practical recommendations for short, medium and long term interventions by key stakeholders.

#### 3.1 Sources of Data

With the help of CRS and its partners' technical staff, and federal, regional, zonal and woreda level organizations and institutions that are involved in seed related activities or that have interest in supporting seed security were identified for interview and consultation. The identified sources, discussed below, provided secondary and primary data necessary for the assessment.

At the federal level, the Disaster Risk Management and Food Security Sector (DRMFSS) of the MoANR, the Agricultural Transformation Agency (ATA), the Ethiopian Seed Enterprise (ESE), Pioneer Hybrid Ethiopia (PHE) and other private seed producing companies, agricultural research centers, Haramaya University and the Integrated Seed Sector Development (ISSD) project were the major sources of information. Zonal and Woreda Agriculture Offices, Regional Seed Enterprises (ASE, OSE, SSE) and their agents, agro-input dealers, local grain market traders, FCUs and private seed producers were important sources of information. At the kebele level, Development Agents (DAs), primary cooperatives and community were the major sources of information.

In preparation for data collection, the assessment team members held a one day<sup>15</sup> meeting to discuss and review a list of sources of data, develop guides and checklists (tools) for data collection, and agree on the data collection fieldwork plan. The guide and checklists were designed to enable collection of qualitative information with some minimum quantitative data.

#### 3.2 The SSSA Tools

The tools developed for the rapid SSSA data collection were grouped into four broad categories: a) key informant guide, b) local market and agro-input dealer checklist, c) seed producer checklist, and d) Focus Group Discussion (FGD) guide (Annex 1).

- a) *Key Informants Interview (KII) guide*: This targeted officials/experts in selected organizations/institutions individually or in small groups of 2 - 3 individuals. It provided contextual information – mostly qualitative but with some limited quantitative primary data. At the federal level, the major focus was on a general overview of the impact of the drought, emergency seed policy and guideline issues, and measures to address seed related problems. At zonal and woreda levels, the major focus was on: the farming and seed system; agricultural input demand estimation and planning, supply and distribution; crop production and the extent the zone or woreda was affected by drought in the failed 2015 *belg* and *meher* seasons; the implication of the

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<sup>15</sup> 9<sup>th</sup> November 2015

poor harvest in the context of seed security of the affected population; and possible ways of addressing any acute and/or chronic seed insecurity. In addition, where applicable, secondary data relevant to the scope of the assessment were collected after the interview.

- b) *Local Market (LM) and Agro-dealer guide*: Local markets and agro-input dealers are possible sources of seed to farm households/communities across Africa. The LM tool was used to gather information on the various aspects of seed security: seed availability by crop and variety and sources, seed prices, quality and suitability of varieties available from these sources. It also looked at some of the practices carried out by grain traders in regards to grain/seed quality.
- c) *Seed producers guide*: this guide helped understanding of production activities, types and volume of seed being produced by the various individuals, groups and cooperatives. It also examined challenges and opportunities for improving seed production.
- d) *Focus Group Discussion guide*: This guide was used at the kebele level with the affected community. In each of the FGDs, between 7 to 35 farmers (males & females) participated (Photo 1) in discussing seed security related issues such as the major crops and varieties grown in their area, average area cultivated per household, seed rates, and yield in normal and bad years, seed sources and channels, seed availability, access, quality and varietal suitability for the major crops.



Photo 1: FGD in Shashamene

The participants also discussed seed security related challenges and suggested ways for how the community can address acute seed insecurity. This provided useful insights into the seed security situation at the community level.

- e) *Field observations*: in order to validate some of the information on poor performance, and more specifically to check if the harvest can be used as seed, the assessment team members made some impromptu field visits to a number of crop fields within and outside the sampled woredas.

### 3.3 Data Collection

Primary data collection was carried out across the four regions covering 10 zones and 17 *belg* growing woredas. Two teams of two experts each carried out the field assessment, in parallel, from the 10<sup>th</sup> to the 27<sup>th</sup> November 2015. Additional support was provided by CRS' implementing partners in facilitating contacts for the teams with various institutions and organizations and offices at zonal, woreda and kebele levels (sources of information).

In each of the selected zones, 1-2 woredas were purposely selected in consultation with the zonal agriculture office. In each of the sampled woredas, 1 to 2 severely drought affected kebeles were selected with the assistance of the woreda agriculture office. Both the zonal and woreda offices assigned relevant experts that accompanied the assessment team to the woreda and kebeles, respectively. Data was also collected from men and women farmers through individual interviews and Focus Groups Discussions (FGD).

Overall, a total of 94 key informants were interviewed from the MoANR at the federal level and zonal, and woreda agriculture offices at the regional level. 31 other key informants from seed enterprises/companies, farmers' cooperative unions, primary cooperatives, local grain traders, agro-input dealers and community-based seed producers at zonal and woreda levels were interviewed, and 17 FGDs were held with 363 (29% female) members of various farming communities across the zones assessed (Table 3). The assessment team also collected secondary data at various levels for further review and triangulation with the primary data. This included seed related regulations and guidelines, past and recent pre-harvest assessment reports, and information on seed stocks, carryover seeds, numbers of affected households by kebele and woreda, seed distribution channels and challenges within the seed systems.

Table 3: Assessment zones, sources of information and number of persons contacted

Region	Zone	Altitude	Key Informant group		FGD		
			MoANR/BoA /NGO/FAO	Other KII	Male	Female	Total
Federal			6	8			
Amhara	North Shewa	H	9	1	18	6	24
	North Wello	H	12	1	20	12	32
	South Wello	H	8	3	47	28	75
	<i>Sub-total</i>		29	5	85	46	131
Oromia	East Hararghe	H/M	9	2	31	11	42
	West Arsi	L/M	6	4	51	13	64
	West Hararghe	H/M	11	3	20	1	21
	<i>Sub-total</i>		26	9	102	25	127
SNNPR	Hadiya	M	8	2	22	13	32
	Kembata-Tembaro	M	4	2	14	2	16
	Wolaita	L/M	11	2	20	8	28
	<i>Sub-total</i>		23	6	56	23	76
Tigray	South Tigray	L/M	10	3	17	12	29
<b>Overall</b>			<b>94</b>	<b>31</b>	<b>260</b>	<b>106</b>	<b>363</b>

Note: H = high altitude areas; M=Mid altitude areas; L=Low altitude area

### 3.4 Data Analysis

Qualitative data analysis: The processes in qualitative data analysis included identifying recurrent or common observations, concepts, ideas, and issues relating to the cropping and seed system as well as the elements and indicators of seed security. The information was then triangulated from various sources to validate the consistency of the data. The findings and observations were then discussed and logical interpretations provided by assessment team members.

Quantitative data analysis: for the minimum level of quantitative data that was collected from the primary and/or secondary sources, statistical summaries such as percentages, sums, averages and standard deviations were used to provide insight into the qualitative data.

### **3.5 Limitations of the Assessment**

Primary data was collected mainly in the worst affected zones, woredas, and kebeles; hence the assessment could have missed opportunities to critically examine the potential availability of seed from the informal sector in the less affected zones and woredas.

The assessment team used mostly qualitative methods in assessing the situation and some quantitative data provided by the key informants. These quantitative data were based on the personal judgment of the key informants which may be influenced by factors such as a personal bias and the psychological effect of the devastating drought.

Some of the seed producers' groups and cooperatives could not be visited as a number of them were located in different woredas or in distant kebeles, hence making it difficult to ascertain the volume of seed from some of these intermediate producers, specifically those who do not have contracts with seed enterprises or have no intention of selling to the seed enterprises.

## 4.0 FINDINGS

### 4.1 Crop Production System

Crop production is one of the major livelihood activities of most households in the areas that were visited. The predominant cropping practice in the assessed zones of Amhara, Oromia and Tigray region is sole cropping, while in East and West Hararghe Zones of Oromia, as well as some woredas of SNNPR, intercropping and relay cropping are common. The production practices across the *belg* growing areas of Ethiopia vary. In most areas, farmers plant (January and March) *belg* crops, harvest the crops and plant (July – Sept) in the same field in the *meher* season with short maturing crops. For example, in Shashemene and Shalla woredas, fields planted with maize in the *belg* season (February) will be planted with tef or haricot bean in the *meher* season.

In Menz Mama Midir woreda of North Shewa zone and Desie Zuria woreda of South Wello Zone, fields are designated for planting either in *meher* or *belg* seasons only. Thus, in a year, farmers produce a single production (mostly sole cropping) on a piece of land either during the *belg* or *meher*. These woredas in the highlands have relatively lower mean temperature (10°C to 18°C). This means the crop growth is slower for highland woredas than in the warmer low and midland woredas. In the highland areas, local barley and wheat varieties are known to have relatively long growing periods. Across the *belg* growing areas of the highlands, barley is planted mid-January and harvested in mid-July, meaning the crop stays in the field for 6 to 7 months, hence not allowing enough time to grow a second crop in the same field.

#### 4.1.1 Major crops for the *belg* season

The major crops grown by households in the assessed zones during the *belg* season include maize, barley, wheat and tef, haricot beans, potato and sweet potato. The proportion of households growing these crops varies between 25% and 100% depending on the location (Table 4). Maize and haricot beans are major crops across the woredas assessed in the lowland and midlands of Oromia, SNNPR and Tigray Regions, while barley is predominant in the highlands of Amhara and some parts of Oromia regions. The other crops are either zonal or woreda specific. The time of planting *belg* crops varies from place to place, with most planting done between mid-January through March depending on the start of rains in a given location. It was reported that the trend of the *belg* rain onset has been shifting towards *meher* season perhaps due to the effect of climate change.

Table 4: Percent of households growing major crops and associated planting times in the assessed zones and woredas

Region	Zone	Woreda	Major crops							Planting
			Barley	Maize	Tef	Wheat	H. Beans	Potato	S. Potato	
Amhara	S. Wello	DesseZuria	100							Mid-Jan
		Kutaba	100			50				Mid-Jan
	N. Wello	Gubalfto	100					75		Mid-Jan – Feb
		Wadla	100							Mid-Jan – Feb
	N. Shewa	Menz Mama Midir	100							Mid-Jan – Feb
Oromia	West Hararghe	Tulo	80	100			100			Feb – Mar
		Gemechis	25	100		50				Feb – Mar
	East Hararghe	Karsa		40				33		March
		Meta	65			25		45		March
	W. Arsi	Shalla		100	45		70			Feb
		Shashemene		75	90		80			Feb
SNNPR	Wolayita Sodo	Dugna Fango		100			30		75	
		Humbo		100			100		80	
	Hadiya	Gombora		73			63	84		
	Kembata-Tembaro	Kadida Gemila		95			90	75		
Tigray	S. Tigray	Raya Alamata		90	80					Feb
		Raya Azebo			75					Feb



#### 4.1.2 Area cultivated and seed rates for major crops

The average land area cultivated per crop and seed rates used by given farmers varies from location to location. Land area cultivated per crop depends on the average land holding, priority a farmer attaches to a crop and the number of crops cultivated per household. Seed rates on the other hand depend mostly on the sowing methods (broadcast vs. row), grain size, the cropping practices (sole, mixed/intercrop or relay cropping), the purpose for which the crop is being cultivated (food, cash or both), and the general soil fertility levels. Because of the high variations in the size of land cultivated across the 10 zones (17 woredas), understanding the household seed requirements needs careful examination of the area and seed rates used per crop in these locations.

**Maize:** The average area planted with maize per household varies across the woredas, with Tulo and Karsa being significantly lower, while Shalla is significantly higher than the overall average (Figure 1a). This significant variation in the areas allocated to maize partly affects the amount of maize seed required by the household. With the exception of the farmers in Raya Alamata (Southern Tigray zone) and Tulo (West Hararghe Zone) woredas (Figure 1b), most locations use seed rates within the acceptable range of the recommended rate (25 kg/ha). In the FGDs, farmers in Raya Alamata and Tulo indicated that they use significantly higher seed rate because the maize crop is partly used for livestock feed. As the crop continues to grow, they keep on thinning the weakling plants and stripping lower leaves to feed their livestock until the right plant density is achieved.

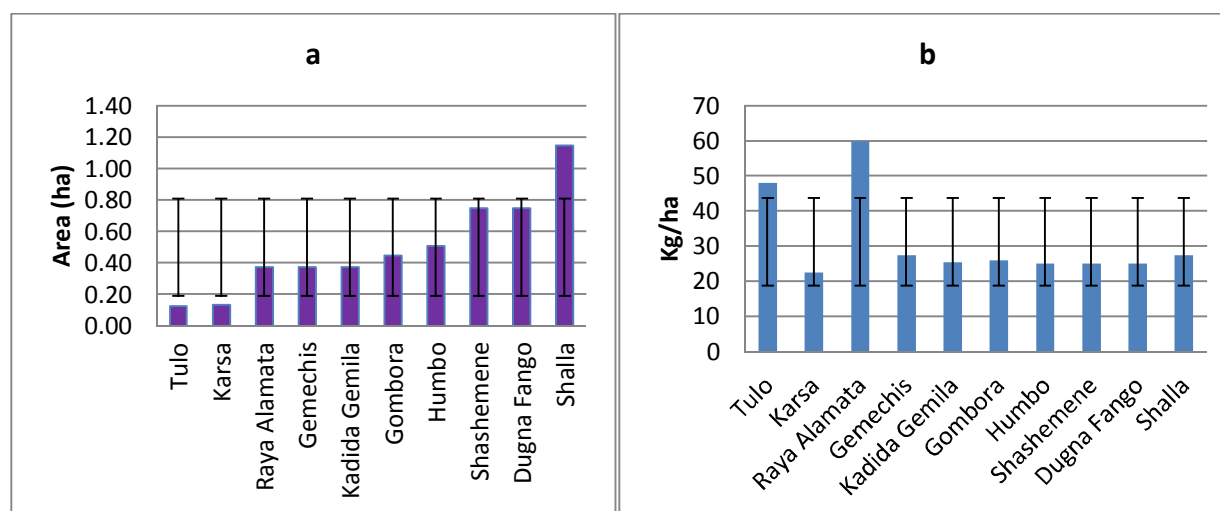


Figure 1: Maize a) average area per household, and b) seed rates (kg/ha).

**Haricot beans:** The area under cultivation for haricot beans varies from location to location, with significantly lower and higher areas per household in Tulo and Shalla, respectively (Figure 2a). In Shashemene, Gombora and Shalla, farmers reported that because of the delayed rains this year they shifted more of their maize fields to short maturing crops such as haricot beans.

Seed rates for haricot beans range from 53 kg/ha to 100 kg/ha across the woredas assessed. Though the seed rates across a number of locations are within acceptable recommended rates (100 kg/ha), the seed rate (53 kg/ha) in Kadida Gamila (Figure 2b) was, however, significantly lower than the recommended rate. This could partly be attributed to the practice of intercropping haricot beans with maize.

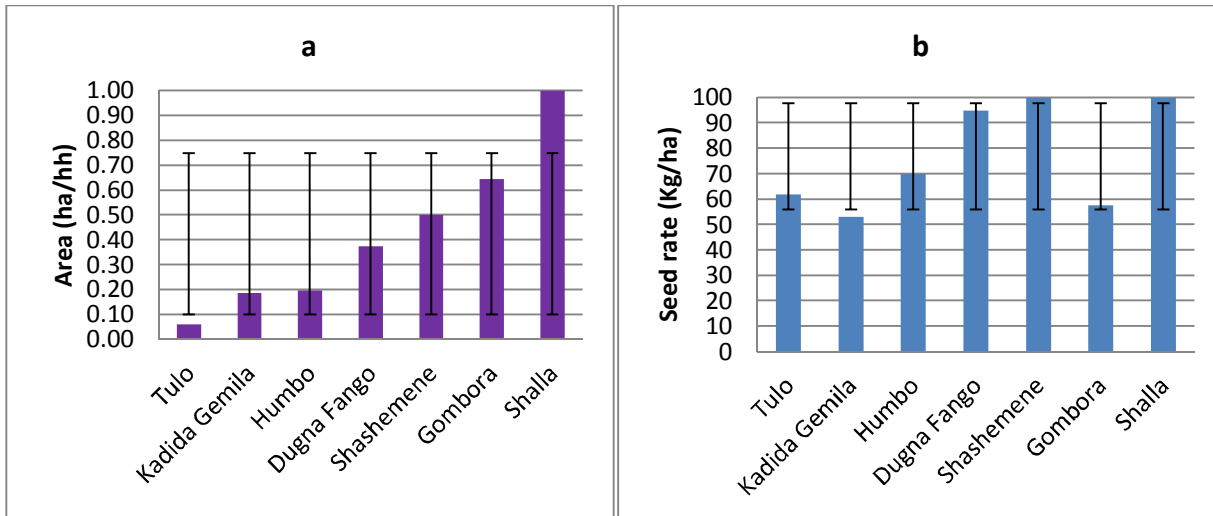


Figure 2: Haricot beans a) average area per household and b) seed rates.

**Barley:** Similarly, the area cultivated per household under barley varies from place to place, ranging from about 0.13 ha in Gemechis to 1.0 ha in Wadla (Figure 3a). In Menze Mama Madir and Wadla woredas (with altitudes about 3400-3500 meters above sea level), farmers allocate nearly all their cultivated land to Barley in the *belg* season. Seed rates for barley across most locations visited are within the acceptable range though significantly lower than the average was reported in Gemechis (Fig. 3b).

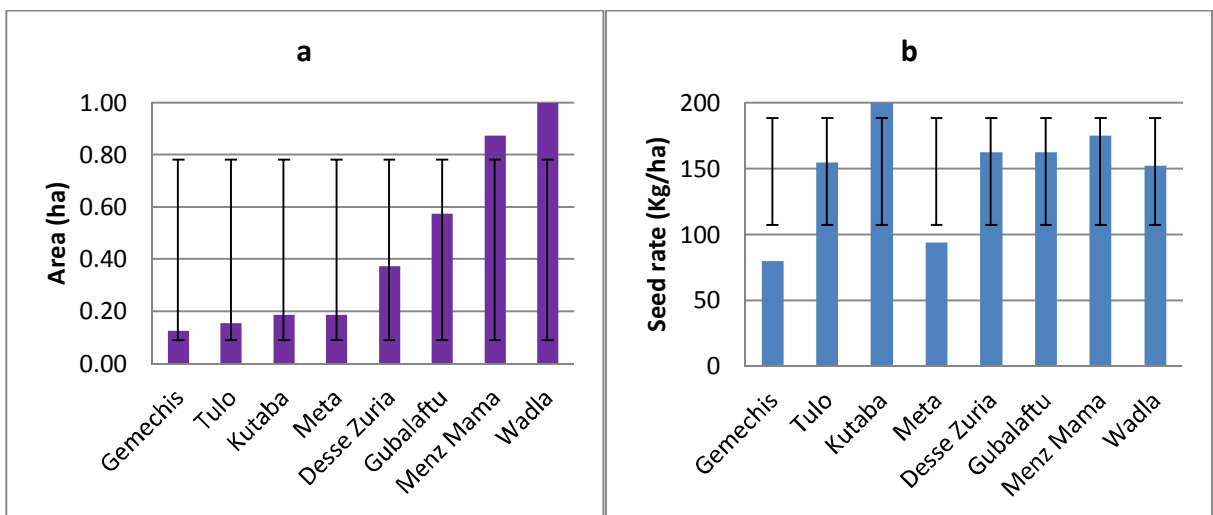


Figure 3: a)

Barley area per household and b) seed rates

**Tef:** The area cultivated per household varies across the tef growing woredas, and this ranges from 0.5 ha/HH in Raya Alamata to 1.5 ha/HH in Raya Azebo, which is significantly higher than the average across the four woredas (Fig. 4a). The area in Raya Azebo is significantly higher because most of the households allocate nearly all their cultivated land to tef during *belg* season, while in the other locations, other crops such as maize and/or haricot beans are cultivated alongside tef during the *belg* season. Significantly higher seed rates (60 kg/ha) is reported at Raya Alamata compared to the normal seed rates of 25-35 kg/ha (Figure 4b), and no clear explanation could be given by the farming population. This could partly be attributed to a lack of proper agronomic knowledge on the best seed rate among farming households.

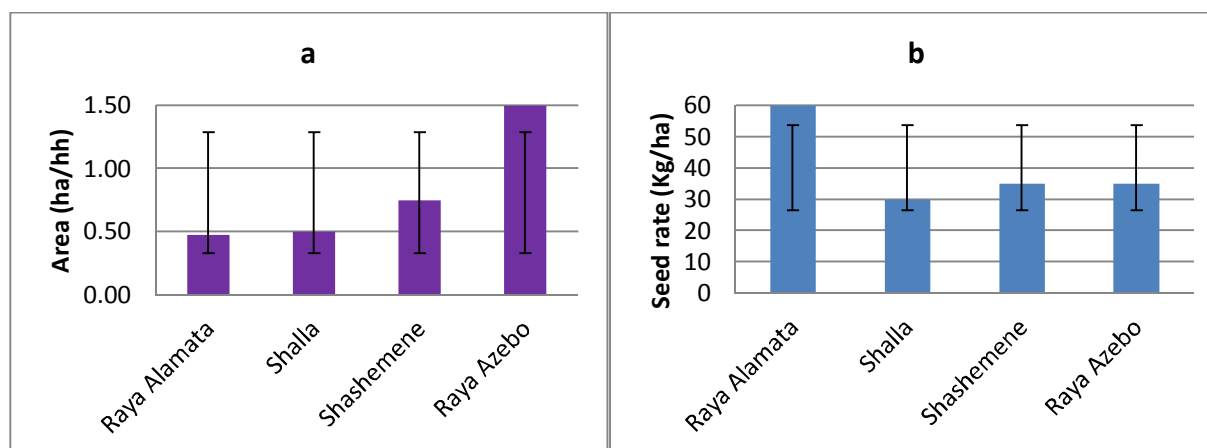


Figure 4: Tef a) average area per household, and b) seed rates

**Potato:** With the exception of Gombora (0.4 ha/hh), the area under potato cultivation is relatively small compared to all other crops, rarely exceeding 0.125 ha per household. The seed rate was only significantly higher in Karsa as compared to the overall average.

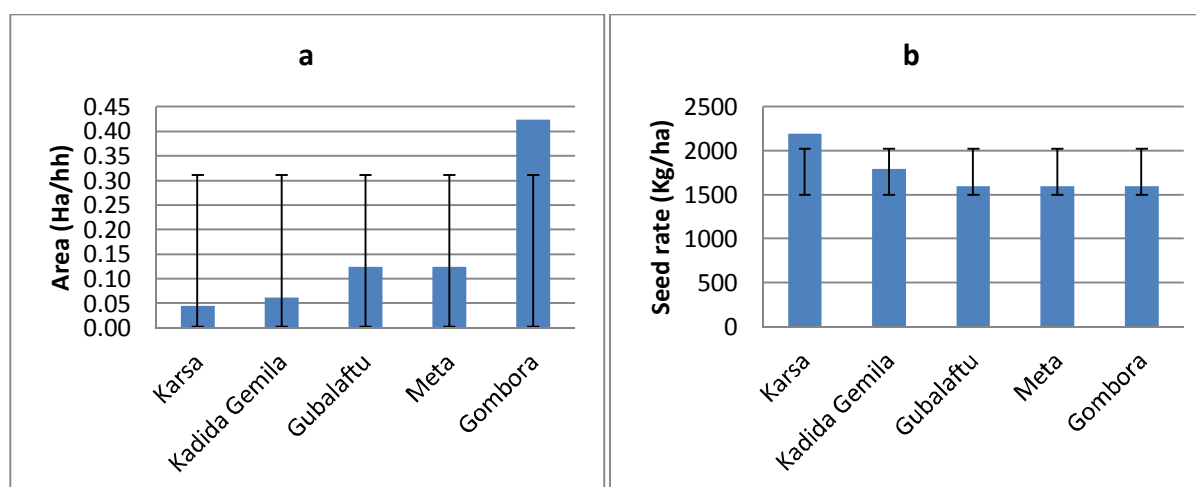


Figure 5: Potato a) average area per household, and b) seed rates and requirements per household.

#### 4.1.3 General crop performance in 2015

Overall, *belg* crop performance was poor in 2015 compared to normal years, with production losses ranging from about 49% to 99% in the *belg* season. Similarly, the available pre-harvest assessment data showed that the production loss for the *meher* season could be between 25% and 96% across the locations visited (Table 5, Photo 2). These high losses were mainly attributed to the late start, poor distribution, insufficient amount and early cessations of rains culminating in drought conditions experienced across the four regions.

Table 5: *Belg* and *meher* production and losses<sup>16</sup> in 2015

Zone	Woreda	<i>Belg</i> production			<i>Meher</i> production		
		Expected (tons)	Actual (tons)	Loss (%)	Expected (tons)	Actual (tons)	Loss (%)
West Arsi	Shashemene	-	-	70	-	-	25
N. Shewa	Menz Mama Midir	-	-	86	-	-	47
South Wello	Desire Zuria	46,360	2,318	95	75,495	55,111	27
	Kutaba	6,116	2,324	62	29,703	11,287	62
	<b>Zonal total</b>	<b>148,421</b>	<b>20,779</b>	<b>86</b>	<b>1,029,003</b>	<b>679,142</b>	<b>34</b>
N. Wello	Gubalfto	-	-	95	-	-	-
	Wadla	-	-	89	-	-	-
	<b>Zonal total</b>	-	-	-	<b>1024,284</b>	<b>327,771</b>	<b>68</b>
S. Tigray	Raya Alamata	73,400	4,404	94	-	936	97
	Raya Azebo	88,300	883	99	66,444	5,980	91
	Ofla	8,380	4,274	49	59877	17963	70
	<b>Zonal total</b>	<b>142,490</b>	<b>14,249</b>	<b>90</b>	<b>290,554</b>	<b>101,694</b>	<b>65</b>
Hadiya	<b>Zonal total</b>	<b>1,101,761</b>	<b>418,669</b>	<b>62</b>	-	-	-
West Haraghe	<b>Zonal total</b>	-	-	-	<b>8,555,000</b>	<b>2,418,271</b>	<b>72</b>
East Haraghe	<b>Zonal total</b>	-	-	-	<b>10,896,293</b>	<b>3,280,379</b>	<b>70</b>

Sources: Extracted from *Belg* and *Meher* seasons harvest and pre-harvest assessment reports



Photo 2: Assesment team member checking a sorghum field with zero harvest in Shashemene

<sup>16</sup> Production losses were either compared to 2014/2015 production or planned figures. Losses were attributed to both reduction in the area cultivated and poor yields due to the drought

Besides the drought conditions, other factors such as floods (in Raya Azebo and Weri), hailstorms, pests and diseases across a number of locations, and frost mostly in the highland areas aggravated the situation. In the areas visited, there is a high level of soil degradation either due to demographic pressure (midland/highland) or livestock population (lowland), impacting negatively on the environment and the eco-system productivity in general. These crop losses could have had significant impact on the informal seed sources, particularly on the availability and quality of seed from own-saving, social networks and local markets.

## 4.2 Seed Security Situation

Seed security in the assessed zones for the 2016 seasons will depend on the overall seed demand of the farming population, seed sources used by the farmers, availability of quality seed and suitability of varieties from these sources, and the capacity of the farmers to access the seed from these sources. The overall requirement or seed demand of a farming community depends on two critical factors, a) the total land area under each of the major crops, and b) the seed rates. Regarding availability, seed could come from different sources, but this has to be in close proximity to the farmers and should be available at the right time for planting. Seed quality and suitability of varieties are two other important aspects of seed security that need attention, as poor quality seeds do not ensure good crop establishment and productivity while unsuitable varieties may not be adapted to the local agro-ecological conditions or do not meet the general needs of the farming community. One critical element of seed security is access to seed, which depends on the capacity of farmers to acquire available seed from optional sources. The assessment here examined these factors in order to determine the seed security outlook for the upcoming *belg* season.

### 4.2.1 Seed demand

The seed demand (requirement) for *belg* and *meher* seasons is normally estimated by the woreda and zonal agricultural offices and submitted to the regional BoA. In some zones, the seed demand for the upcoming *seasons* has been estimated while other zones are in the process of doing so. Using available data on the average land area per household for major crops, seed rates, household numbers and percentages of household growing the major crops during the *belg* season, an estimated 9,779 tons of major cereals, 2,864 tons of haricot beans, 13,435 tons of potato and 304 million cuttings of sweet potato will be required to meet the overall planting need of the farming community in the assessed *belg* growing woredas.

Based on the percentage of seed insecure households estimated by woreda agricultural experts and that obtained during a number of participatory FDGs, the overall requirement for the emergency seed response in the assessed woredas is estimated at 6,316 tons of seeds for major cereals, 1,941 tons of haricot beans seeds, 8,087 tons of potato tubers and about 231 million cuttings of sweet potato. The major crops and quantity of seed required for an emergency response varies from woreda to woreda (Table 6). This amount is significantly high and requires a concerted response from a number of key stakeholders interested in intervening with seed and planting materials.

Table 6: Seed and cuttings requirements for emergency response in 2016 *belg* season for sampled woredas

Woreda	Major Cereals					Pulse	Roots & Tubers	
	Barley (tons)	Tef (tons)	Wheat (tons)	Maize (tons)	Total (tons)	H. Beans (tons)	Potato (tons)	S. Potato (#cuttings)
DesseZuria	974				974			
DugnaFango				190	190	108		113
Gemechis	20		40	83	143			
Gombora				287	287	168	4114	
Gubalfto	156				156		250	
Humbo				317	317	343		118
KadidaGemila				78	78	77	725	
Karsa				21	21		557	
Kutaba	86		21		107			
Menz Mama Midir	966				966			
Meta	311		126		436		2443	
Raya Alamata		230		145	375			
Raya Azebo		485			485			
Shalla		43		202	245	447		
Shashemene		451		269	720	764		
Tulo	169			57	226	33		
Wadla	591				591			
<b>Grand Total</b>	<b>3,272</b>	<b>1,209</b>	<b>187</b>	<b>1,648</b>	<b>6,316</b>	<b>1,941</b>	<b>8,087</b>	<b>231</b>

Note: Sweet potato unit is in million cuttings.

#### 4.2.2 Seed sources

Farmers in the *belg* growing areas access seed from different sources within the formal and informal sectors. According to the focus group discussions, about 72.2% of the farmers sourced seed in 2015 from the informal sector, with the majority of them sourcing from local markets (31.4%), followed by own-saved seed (28.4%) and social networks (9.7%). For farmers who planted haricot beans in 2015, 77.5% of them sourced seeds from the local market, while for wheat and barley, 56% and 38.6%, respectively, bought seed from the local market. Farmers in Shashemene and Shalla woredas bought seeds of haricot bean and tef from local grain traders. This is also true for tef growers in Raya Alamata woreda. Own-saved seed was the major source of barley and tef seed in 2015, with up to 40% and 30% of the farmers, respectively, depending on this source.

In the assessment about 27.2% of the farmers sourced seed from the FCU (formal sector) in 2015. The formal sector was an important source of wheat and maize, with about 44.0% and 53.2% of the farmers acquiring seed from this source, respectively (Fig. 6). Only about 5.0% of the farmers sourced seed from the agro-input dealers, and this was mainly in Shashemene and Shalla woredas, in West Arsi zone. The formal sector played a very limited role as main source of seed for crops such as haricot bean, barley and tef in 2015.



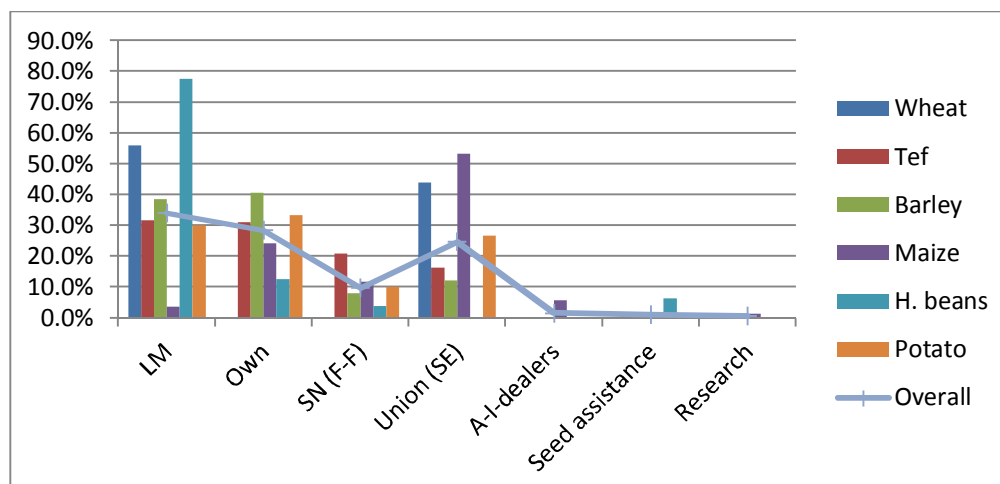


Figure 6: Proportion of farmers getting seed from various sources in 2015 planting seasons

For the upcoming seasons in 2016, seed sourcing by the farmers might change significantly. A smaller proportion of the farmers are expecting to use seed from the informal sources such as farmer own-saved seed and local markets due to the near total production loss of *belg* and significant yield reduction in the *meher* season of 2015. There are high expectations among the farming population in the assessed areas for seed assistance in 2016. Up to 33.3% of the farmers are expecting seed assistance. Many of them expect that unions will be the major source of wheat (50%), barley (50%) and haricot bean seed (37.7%) for the 2016 seasons (Figure 7). A higher proportion of the farmers expect to get more tef seed (56.7%) and maize (50%) from unions, while those in Shashemene and Shalla expect to get maize seed (25%) from the agro-input dealers. The expectation of seed assistance is similarly to the findings of long term seed aid study in Ethiopia.<sup>17</sup>

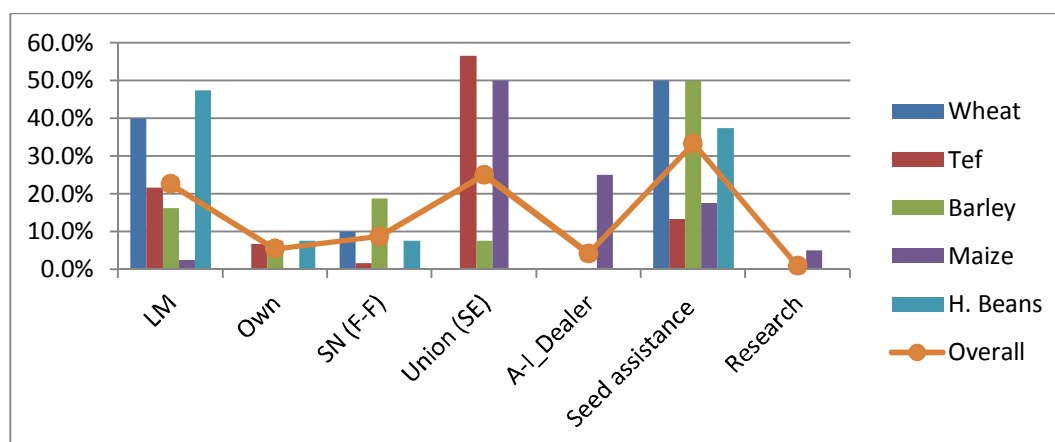


Figure 7: Proportion of farmers expecting seed from different sources for the upcoming seasons in 2016.

The local market will probably remain an important source of haricot bean seed, whereby up to 47.5% of the haricot bean growers hoped to get seed from this source in 2016 season. Similarly, about 40% of the farmers who grow wheat expect to source seeds from the local market and 50% of farmers expect to get seed from emergency seed from NGOs and government. The high expectations for the emergency seed support signify acute seed insecurity in the assessed zones.

<sup>17</sup> Sperling *et al.*, (2007)

Though the market will still make some contribution as expressed by those who hope to get seed from this source, there are, however, concerns on the quality and prices of seed from this source. The agricultural experts at zonal and woreda levels reported that the rains stopped at flowering and grain filling stages in most areas, and this most likely affected the physiological development of the grains resulting in poor seed quality that may lead to poor germination, growth, productivity and production. Again, since there was poor production, the supply of grain is expected to progressively decrease in the local markets. Therefore, the forces of demand and supply are expected to push the prices of the grains that could be used as seed upward.

### Change in seed sourcing between 2015 and 2016:

Given the poor performance of crops in the last two consecutive seasons, the assessment revealed a reduced proportion of farmers depending on the informal sector. The percentage of farmers to use this source is expected to drop by nearly half (35.6%) of the percentage of farmers that used informal sector in 2015. The proportion of farmers who will use own-saved seed (-23.0%) and the local market (-11.6%) is expected to significantly decline, though use of social networks will remain roughly the same in the following season (Figure 8). This signifies a limited availability of own-saved seed, which can be primarily attributed to the impact of the drought. The reduction in seed access from the local market could signify either limited availability or stressed access, which could be linked to limited supply and possible increases in prices of grain that could be used as seed for planting in the upcoming seasons.

Overall, seed availability through the formal channels (the unions and seed enterprises) appeared stable as one possible source of seed for 2016 seasons, but expectation is high for seed assistance (32.4%), possibly because of the very limited seed availability from the informal sector (local market and own-saved seed) and/or limited access from the local market. In West Arsi zone, particularly in Shashemene and Shalla woredas, where few agro-input dealers operate, farmers expect an increase in supply from this source to contribute to the overall pool of seed sources, especially for hybrid maize seed. The significant increase in the percentage of farmers hoping (from 5% to 25%) to acquire seed from agro-input dealers in these two locations demonstrates their willingness to acquire seed from this source. However, their ability to do so may be lacking.

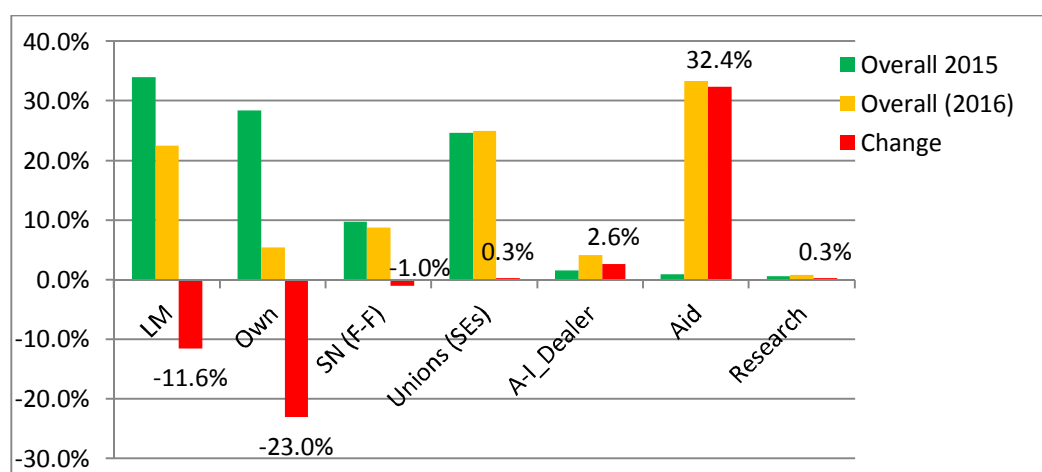


Figure8: Changes in proportion of farmers sourcing seed in 2016 compared to 2015

#### 4.2.3 Seed channels

Seed from the formal sector is highly controlled, and channeled mostly through the primary cooperatives and/or the woreda agricultural offices. Some limited quantities pass through the agro-input dealers and agents of the

seed companies (Figure9). Though the policy directive from the government requires that “the poorest of the poor” are provided seed on a loan basis, the assessment team learnt that in some locations, relatively “better off” farmers who buy fertilizers from the cooperative could be granted access to seed on loan as well.

The major channels of the informal system are the farmer’s own saved seed. Seeds flow from farmer to farmer and from grain trader to farmers through the market, and the origin of the seed in the informal channel is primarily the farmer’s production.

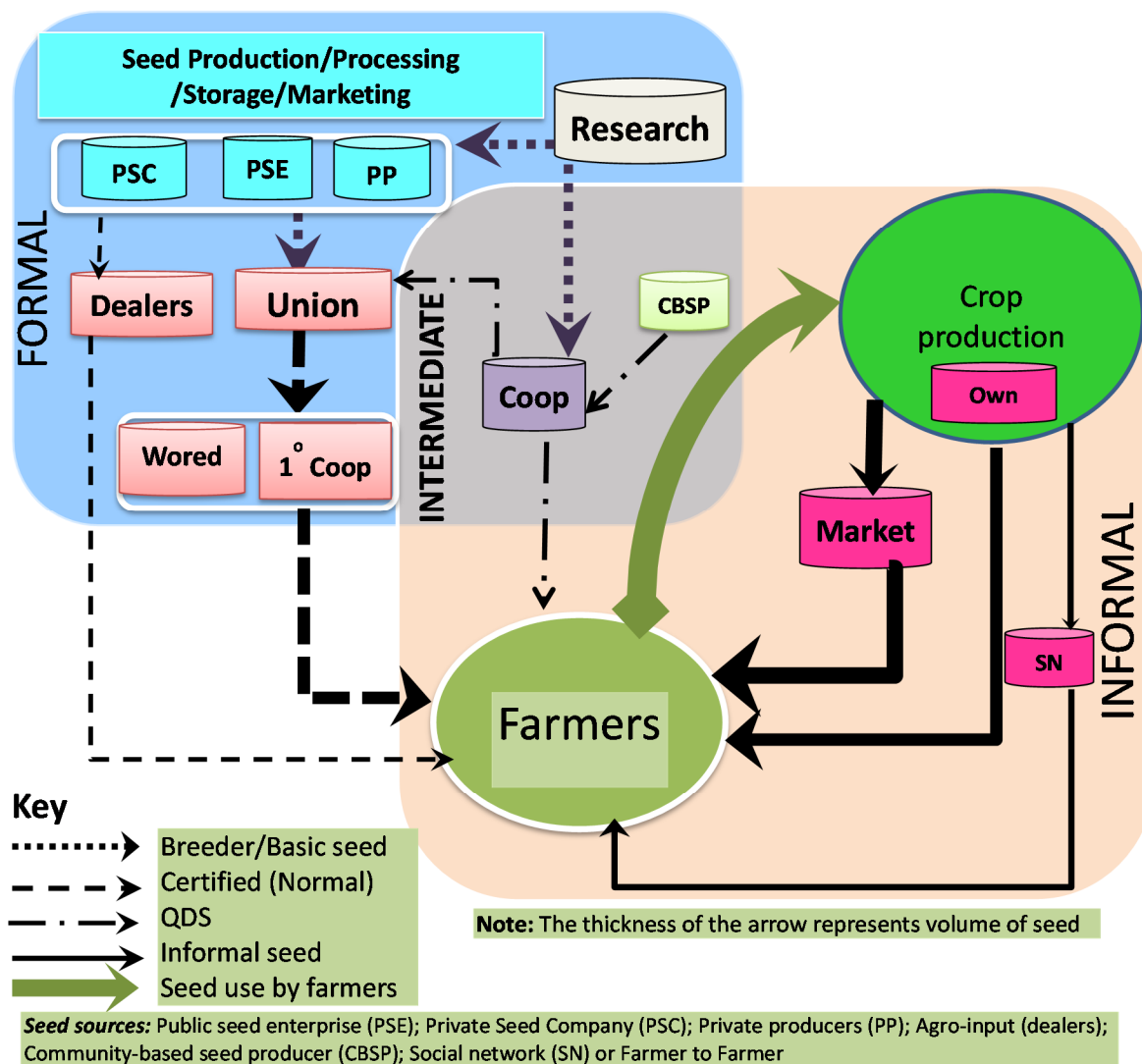


Figure 9: Seed sources and channels in Ethiopia

#### 4.2.4 Seed availability

For any agricultural production to take place, seed must be available in the required amount, within close proximity to the farming households and at the right time for planting, irrespective of the source and variety. Seed availability, therefore, defines the entry point in crop production and this needs critical examination especially when disaster occurs. This report examined and analyzed seed availability from both the formal and informal sectors, putting into perspective the major indicators of seed availability (Box 1).

*Box 1: Indicators of seed availability*

- a) *Quantity* – should be sufficient to meet the planting needs of all famers in a given location
- b) *Proximity* – seeds should be within reach of the famers in a given location
- c) *Timeliness* – seed should be available in time for planting in a given location

##### *i) Availability from formal seed sources*

From the formal sector, over 140,051 tons of major cereals; 6,000 tons of major pulses; 884 tons of potato and 29.5 million cutting of sweet potato will be potentially available<sup>18</sup> (Table 7) for use by farmers nationwide. This potentially available seed includes carryover from previous harvest and forecasted seeds from the 2015 harvest. Overall, the seed available from formal and intermediate sources could contribute up to 21.5% of the national seed requirements<sup>19</sup> (Figure 10). By crop, the formal sector will be able to provide seed that can cover about 61.2% of the area planted with maize, 35.7% of wheat area, 19.5% of tef area, 7.4% of haricot beans area, and 4.5% of barley area. Similar contributions by the formal sector in Ethiopia have been reported in other assessment reports.<sup>20</sup> The quantity of other seeds, including food barley seeds, that are supplied from the formal sources is very limited. The fact that large volumes of these seeds are still with the different seed enterprises, making them available in proximity to the farm households requires immediate attention, particularly for the upcoming *belg* season, and this need to be done in a timely manner.

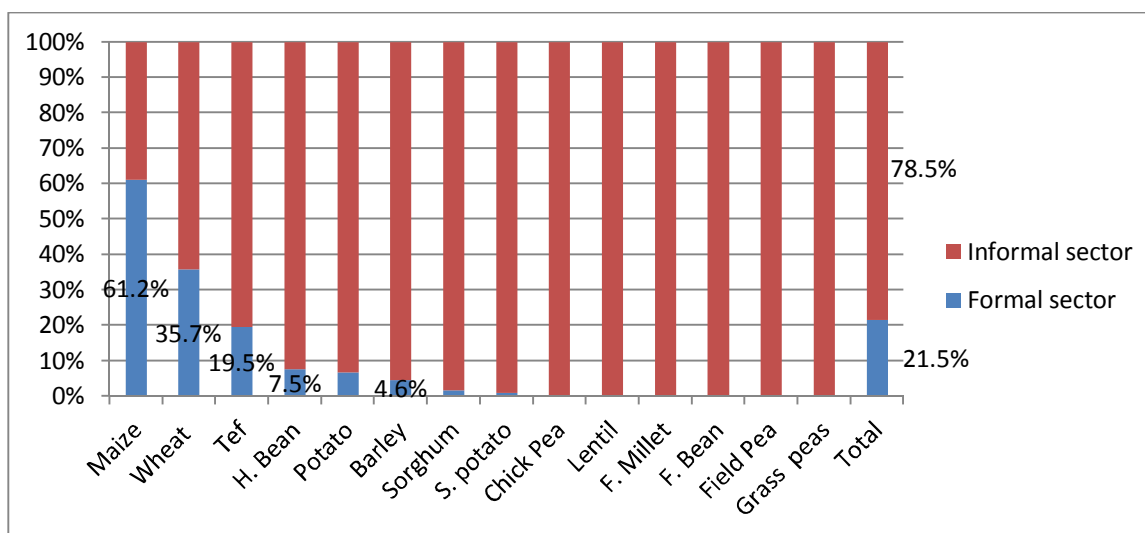
<sup>18</sup> Potential availability recognizes quantity, but consider that the available quantity is not yet in close proximity to the farm households, and need to be there in time for planting

<sup>19</sup> Based on the area planted with crops in 2014.

<sup>20</sup> CRS, 2007; and CRS; 2012

Table 7: Crop seed estimated to be available with the formal seed producers

	Crop	Seed Source – quantity in tons							Total
		ESE	OSE	ASE	SSE	PHE	Private	Cooperatives	
Cereals	Maize (H)	4,818	6,704	1,471	2,865	9,000	3,979		28,837
	Maize {C}	909			23			730	1,662
	Wheat	17,410	31,529	12,858	4,146		745	19,384	86,071
	Barley (M)	649	3,437	1,377				1,650	71,13
	Barley (F)	259	71	10				714	1,054
	Tef <sup>21</sup>	2,813	148	5,822	920		414	4,555	14,671
	Sorghum	79		667				394	539
	F. Millet	49						53	102
Pulses	<b>Sub-total</b>	<b>26,986</b>	<b>41,888</b>	<b>21,605</b>	<b>7,953</b>	<b>9,000</b>	<b>5138</b>	<b>27,480</b>	<b>140,051</b>
	H. Bean	817	155	8	600		106	777	2,462
	F. Bean	82		23				394	497
	Field Pea	33						104	135
	Lentil	347						451.1	798
	Chick Pea	1002		56				1,049.0	2,106
	<b>Sub-total</b>	<b>2,279</b>	<b>155</b>	<b>87</b>	<b>600</b>	<b>0</b>	<b>106</b>	<b>2,773.4</b>	<b>6,000</b>
Root and tuber	Potato						1,425	7,416.2	8,841
	S. potato						9.2	20.0	29



<sup>21</sup> There could be some double counting for tef as seed enterprises source raw seeds from cooperatives and data are collected from the two sources

Figure 10: Proportion of crop area that could be covered by seed from the formal sector in 2016<sup>22</sup>

Analysis of the seed supplied through the formal channel in Amhara and Tigray in 2015 showed that, despite the supply being less than the planned amount, about 17% to 42% of the seed supplied was not utilized at zonal levels (Box 2), and this scenario may cut across a number of zones and regions. The carryover is not limited to the zonal and woreda levels. The seed enterprises also have stock of carryover from previous seasons. For example, about 1,140 tons of carryover was reported by Amhara Seed Enterprise, and about 4,890 tons reported by Oromia Seed Enterprise. There are, however, a lot of challenges with the formal channels which are highly controlled by the government. Apart from the carryover, there were complaints regarding late delivery of seed, and some quality concerns reported, with a lack of accountability from the supply side. Assessments of performance and experiences of the Integrated Seed Sector Development (ISSD) project's direct seed marketing in Amhara and SNNPR revealed similar findings.<sup>23</sup>

Box 2: Seed carryover in some zones in 2015

Zone	Quantity (tons)				% Carry over
	Plan	Supplied	Utilized	Carry over	
South Wello*	-	1,734	1,379	355	20
North Wello*	3,868	1,426	1,149	282	20
Southern Tigray*	3,142	1,560	1,289	270	17
S. Eastern Tigray	1,450	417	323	93	22
Eastern Tigray	1,223	1,223	711	512	42
Central Tigray	673	501	397	104	21

\* Most drought affected zones.

The seed carryover by the union/zone/woreda in 2015 was attributed to a combination of factors including:

- Mismatch between demand for seed and allocation made:* this was also noted to increase the operational costs of the unions, and cause excess supply in one area and deficiency in other areas.
- Late delivery attributed to limited financing of the union:* Procurement of seed by the union depends on the financing supplied by the Regional Finance Bureau (RFB), which provides limited finance by installment (for example, Yewol Union in South Wello received funding in April, May and June) which limits timely delivery of seed to the farmers. The procurement of the last lot may be effected late, and by the time seeds are transported to the distribution centers, the planting window may have passed.
- Farmers change their demand and use local seed:* Though the demand for the seed at woreda level is provided well in advance of the start of the planting season, change (delay) in the start of the rains sometimes forces farmers to change their priority crops, which leads to change in seed demand, and hence carryover.

<sup>22</sup> Reference area (Ha) is for 2013/14, on the assumption that the area will not change significantly

<sup>23</sup> Getahun *et al.*, 2014; Nefo *et al.*, 2014



- d) *Relatively high prices of seed from the union:* Analysis of prices of seed from the formal and informal sources shows that the prices from the formal sources are 1.5 to 2 times higher than the prices of grain and seed from the informal sources (local market and social networks), and farmers make choices based on their purchasing power, and this may partly contribute to carryover.

**ii) Seed availability from the informal sources**

Major sources of seed from the informal sector include own-saved seed, local markets, and social networks or farmer to farmer seed transfer. Although there was almost total loss in the *belg* season, and poor harvest from *meher* in general, pockets of fair harvest have been observed across areas visited, and some farmers have not lost hope in using seed from their little harvest (Photo 3). In a number of FGDs, farmers recognized that despite the poor harvest in 2015, the informal sector will still continue to play some role (Figure 7), with seed coming from relatively better off production areas through trade, particularly social networks and local markets (Photo 3), and specifically to those who can afford to buy.

Seed that could still be sourced by the farmers through the informal channel will include barley, haricot beans, tef and wheat, and to some limited extent potato. In some of the woredas visited in North Shewa, North and South Wello zones, farmers still practice traditional seeds selection, cleaning and selling barley and wheat seed during planting time. This implies that the informal system could still provide windows of opportunities to source of seed of these crops for emergency support. As observed in these locations, some primary cooperatives, with support of NGOs, are already buying and storing potato seed for the next planting. In Shashemene and Shalla, where farmers tend to depend more on local markets, grain traders/markets remain potential sources that will probably make some seed available to the farmers who can afford.

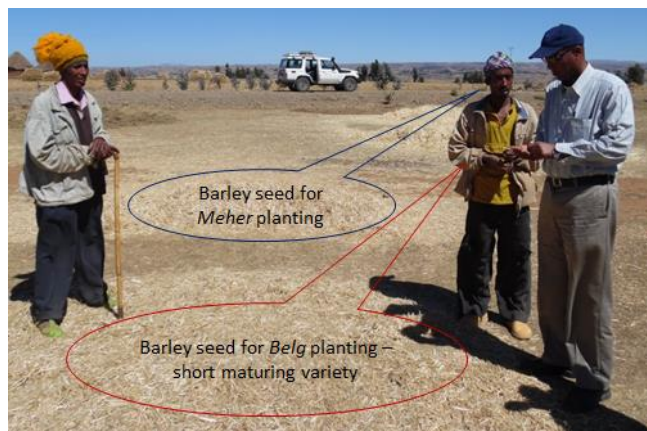


Photo 3: Assessment team member (left) discussing with a farmer threshing barley seeds in Wadla and checking (right) quality of bean (Nasir variety) in Shashemene grain market

Grain traders in Shashemene market consider cleanliness and freshness (recent harvest) of the crop/variety as well as the origin of the crop/variety. In addition, where the grains are not clean enough, they pay women to do additional cleaning to meet minimum analytical purity, and sometimes grade grain and seed differently. Though the local grain traders may move grains from areas with relatively good production to areas with poor harvest, the supply and demand effect may push the prices of grain higher as the limited harvest becomes depleted, limiting access to seed for the most vulnerable households in the hard hit areas.

#### 4.2.5 Seed access

Seed access denotes ability and willingness of the farm family to acquire seed through cash purchase, exchange, loan, barter or use of power in social networks. Major indicators of seed access are indicated in Box 3. While seed may be available from alternative sources, it may not be accessible to all farm families due to lack of capacity, power, status or influence, and/or price deterrence. Where availability from own seed and social networks is highly constrained, farmers may access seed from the local market and/or the formal sector (seed enterprises) if they have the capacity to do so.

##### Box 3: Indicators of access

- a) *Seed prices* – prices of seed from different sources or changes in price affect access to seeds
- b) *Disposable assets* – (grain, small ruminants, perennial crops e.g. Coffee, Khat). Access could be limited as there is significant production loss, livestock loss, change in prices of livestock and grains or perennial crops.
- c) *Social capital* (social network) – receiving seed with less financial capital, remittances. With wider effect of disaster social capital may not hold.
- d) *Credit and financial services* – where farmers have no or limited access to financial services, access to seed may be constrained.

*Prices of seed from various sources:* From discussions with the farmers, the price of the seed from the union, even under normal conditions, is relatively higher when compared to prices of grain/seed in the local market (Table 8). The prices of the seed (e.g. tef and haricot beans) collected and sold locally by the union are relatively cheaper than those coming from the seed enterprises. It should, however, be noted that the variation in seed prices from different sources is due to seed quality, and transportation and overhead cost, depending on how far the kebeles are from the seed stores. The complaints by farmers on the prices of seed from the unions (seed enterprises) are well recognized by agricultural experts at zonal and woreda levels. This in many cases leads to poor access to seed from the union as farmers with limited resources tend to resort to meeting their seed need from local markets and social networks, but mostly with lower quality seed. In North Shewa, North and South Wello Zones of Amhara Region, farmers produce, select, clean and keep stock of local seeds for their own use and to sell as seed on the local market or through social networks. In these locations, the price of seed is higher than the price of grain (barley) for food. In areas where grain is sold as seed in local markets, relatively higher prices are charged for the seed because of the difference in quality.

Though the prices of seed from the formal sector are relatively high, these are expected to remain stable since they are regulated by the government, which is involved in setting prices by considering the seed production costs and farmers' ability to buy the seed. However, the prices of both grain and seed in the local market or those from the social networks are expected to rise due to limited supply from the poor harvest experienced in 2015.

Table 8: Seed prices (Birr/kg) from cooperative Unions and local markets in the 2015 *meher* season

Crop	ESE price	Union Price	Local Market Price (Birr/kg)		Price difference between Union & LM
			Grain for	Seed	
Wheat	13.80	13.8 – 18.2	9.0		
Tef	22.58	16.0 – 24.0	10.0 – 12.0	14.0 – 16.0	2.0 – 8.0
Barley	13.57	15.0 – 23.6	11	13.0 – 20.0	2.0 – 3.6
Sorghum	14.53	16.5	7		
H. Beans	17.39	12.0 – 18.0	6 – 8	8.0 – 11	3.0 – 6.0
Maize (Hybrid)	18.3 – 22.6	22.0 – 28.8			
Maize (Hybrid) – Pioneer		42.8 – 48.8			
Maize (Composite)	11.5	11.5 – 21.6			

From the key informants' interview and FGD, possible seed access mechanisms for the farmers include, among others:

- a) *Sales of livestock – mainly small ruminants*: It was noted that about 80% of the farming households own livestock, with those in the highlands having 3-7 sheep, those in the midland having 1-4 small ruminants, while those in the lowland areas have larger herd sizes. In a number of FGDs, farmers indicated that livestock were being priced between 500 to 700 birr per animal, perhaps due to poor animal body conditions resulting from a reduced feed supply. With the declining feedstock, livestock body conditions are expected to deteriorate further, and this will push the livestock prices downwards affecting the food and seed purchasing ability of the farmers.
- b) *Seed loans from cooperative unions*: The guidelines on input distribution allow cooperative unions, through the primary cooperative societies at kebele level, to provide seed loans to the most vulnerable households. However, any default in repayment of the seed or fertilizer loan automatically prevents access to the subsequent distribution program, hence aggravating the seed insecurity status of those who failed to produce and repay the loan. It should also be noted that cooperative unions provide seed mostly for the *meher* season, and therefore this option is most likely not going to be available to the affected households in the *belg* season.
- c) *Remittances*: Some members of the FGDs indicated that a few relatives in towns and beyond sometimes send financial support to the farmers. It was, however, noted that a very few number of households normally benefit from remittances. As it is not a common option, it may not as such contribute to most farmers in the affected areas as far as seed access is concerned.
- d) *Sales of pulses, potato and grains (malt barley)*: Some crops such as pulses, potato, haricot beans, and tef are mainly produced as cash crops to generate income. In the severely affected areas, this income is expected to significantly decline due to total production loss or poor harvest. Thus, accessing seed through income generated from the sales of crops will decline.

- e) *Cash for work/manual labor work*: Though some farmers mentioned this as one of the coping strategies to earn a living, these are not always available and the earnings are only sufficient to meet daily requirements. The earnings are rarely saved and it is unlikely that a considerable number of households will access seed through this income source.

Overall, because of the poor harvest, limited disposable assets, constrained social capital due to the impact of the drought, and a lack of credit and financial services among the affected households, access to seed by resource poor households is considerably limited.

#### 4.2.6 Seed quality issues

Seed quality is an important element of seed security as it defines the success or failure of crop establishment, and contributes to productivity of the crop planted. Indicators of good seed quality are indicated in Box 4. A number of agricultural experts at the zonal and woreda levels expressed fear that the seed from the *meher* harvest could be of poor quality in terms of grain filling and could be reflected in poor germination when used as seed by the farmers. Poor grain filling could be attributed to a number of factors, key among which are low amount of rainfall during the flowering and grain filling stages, and frost and hailstone in some locations.

##### **Box 4: Seed Quality Indicators**

- a) *Germination* – ability of seed to sprout and grow into a normal seedling within a specified duration.
- b) *Analytical purity* – the extent to which a given seed lot has other crop seeds, weed seeds, broken seed, and the inert matter.
- c) *Varietal purity* – the extent to which a given variety is mixed with other varieties of the same crop. This may or may not be of concern to farmers.
- d) *Seed health (Phytosanitary)* – the extent to which a given seed lot or source has pests or seed borne diseases.

The assessment team carried out spot checks in a number of crop fields across the assessed areas (Photo 4). There are mixed observations in that a significant number of observed fields have completely failed (no harvest), others with very little harvest and poorly filled grains, while some pockets of fields have production that could possibly serve as seed sources for farmers if they meet the minimum levels of acceptability. Experienced farmers in the highland areas of North Wello reported that barley and wheat seed are normally obtained from fields located in the bottom of the valleys, as the seeds harvested there are considered less susceptible to frost than those in open fields.



Photo 4: Assessment team member a) carrying out quality spot check in fields; and b) tef grain that could be used as seed in the local market in North Wello Zone, Amhara region.

Seed sources present mixed seed quality issues. From a number of FGDs, farmers rated the quality of seed received from the seed enterprises through agriculture office or unions as very good, followed by farmer retained seed (often the second generation of improved seed varieties received through the formal channel), which was rated as good quality. The seeds accessed through social networks were in most cases rated as medium to good quality, while the seed accessed from local markets were considered to be of the least quality due to seed impurity where a mixture of varieties (sometimes with weed seed) commonly occurs. Farmers have complained about the quality of some seeds sourced locally by unions and distributed to the farmers. For example, farmers in Raya Azebo complained that the mixed tef variety distributed by the cooperative union for the 2015 *meher* season had poor germination rates.

In the maize and wheat growing areas, there were concerns about the possible spread of Maize Lethal Necrosis Disease (MLND) and yellow rust which could be transmitted through seed. As the formal sector is the major source of maize seed, care need to be taken in regards to the potential danger of MLND from this source.

#### 4.2.7 Varietal suitability

Varietal suitability was assessed in terms of ecological suitability of the varieties to produce high yield in a reasonably short period, resistance to pests and disease, economic suitability (attracting higher demand and price) and social acceptability including taste for consumption. Generally, farmers appreciate the performance of some of the varieties being distributed through the formal channels, particular in terms of yields, and earliness in maturity that enable them to escape mild dry conditions. A few concerns were raised by farmers in regards to the suitability of varieties currently cultivated by the community. For example, there were some concerns, in North Wello, by farmers who reported that the wheat variety called *kakaba* does not do well in colder areas such as Borena.

##### *Box 5: Indicators of varietal suitability*

- a) *Adaptability* – performance (growth & yields) of given variety within a range of agro - ecological zones.
- b) *Preference* – meeting end users' needs (e.g. food, fodder, feed, value addition, market, etc.) of the famers



Discussions with Alamata Agricultural researchers indicated that there was stem rust epidemic which has led to the complete loss of wheat crop in three kebeles. Different varieties of the major crops selected for the emergency interventions have been disseminated and are in use by the farmers. These varieties are adaptable under specific agro-ecologies. Some of the popular crop varieties being cultivated across the assessed woredas are given in Annex 2.

#### 4.2.8 Overall seed security situation

The proportion of seed insecure households in the areas studied is high. The team triangulated information obtained from different sources. Participants of the FDGs reported 55% - 90% of farmers as seed insecure. Woreda level officials and experts reported a range of 28% - 86% seed insecure households in the affected *belg* growing areas. The proportion of seed insecure households at zonal level was lower in general when compared to the woreda and community level figures on seed insecurity (Table 9). The zonal level figure considers non-affected woredas as well, while the woreda level data includes non-affected kebeles, which may push the proportion numbers down. The community level data reflects conditions in a single area only, though expectations may pull the figure up to a certain degree, as only the most affected kebeles were visited.

Table 9: Proportion of seed insecure households in the affected areas

Zone	Proportion of seed insecure households as reported at --- level (%)		
	Zonal	Woreda	Community
East Hararghe	38.0	38.4	82.5
West Hararghe	34.4	33.7	65.0
Hadiya	15.7	86.0	80.0
Kembata-Tembaro	46.2	28.0	90.0
Wolaita Sodo		69.0	83.0
West Arsi		80.0	55.0
North Shewa	75.0	70.0	60.0
South Wello	50.0	85.0	80.0
North Wello	50.0	53.0	58.0
Southern Tigray		30.0	90.0

In general, the near total production loss in the *belg* and poor performance of the *meher* season significantly reduced overall availability of seed from the informal sources. Though a significant volume of certified seed is available from the formal sector, this can only be considered potentially available until the seeds are brought in close proximity to the farming communities at the right time for planting. With the significant reduction of availability of seed from the informal sector, and with limited disposable assets, constrained social capital, possible increases in grain/seed prices, and a lack of credit and financial services, access to seed will be the major limiting element even if the seed is made available from the formal sector.

### 4.3 Drivers of Seed Insecurity

There are a number of factors that directly or indirectly contribute to seed insecurity in the areas assessed. The major ones are:

- a) *The severe impact of the drought on production in two consecutive seasons:* The *belg* season failed by about 90% in some zones (e.g. Southern Tigray), and in some woredas the loss is as high as 99% (Raya Alamata). The pre-harvest assessment also showed that the production in the *meher* season was poor. In areas where the main source of livelihoods is agriculture, such a severe drought impacts negatively on income, and therefore all other livelihood aspects.
- b) *Several re-plantings during the belg and meher seasons:* Farmers in the areas visited reported that they replanted two to three times and exhausted their seed stock and capacity to buy from alternative sources.
- c) *Low level of disposable assets:* The average asset base in terms of livestock is small. About 20% of the households have no livestock, and a substantial number of farming households have less than two small ruminants. Thus, the resource base to finance seed purchase from their meager productive assets (livestock) is low. In addition, there are already poor terms of trade for livestock, and declining livestock prices as their body condition deteriorates due to feed shortage.
- d) *Increase in prices of seed and other food items:* As the year progresses, the small harvest stock of crop will be further depleted, demand for grains in the local market will continue to rise, and by the planting time, the prices of grain that could be used as seed will increase. This will further limit many poor households from accessing seed from this source, while seed from the unions are considered too expensive even under normal conditions.

#### 4.4 Seed Security Challenges

The followings were identified as major seed security challenges in Ethiopia:

- a) *Inadequate seed supply by the formal sector:* The problem is more severe for some crops such as barley, tef, haricot beans and sorghum. The impact of the drought and repeated planting significantly affected availability of seeds of local varieties in a number of places. For example, *Muhira* sorghum is commonly grown in East and West Hararghe Zones and serves as the sorghum basket of the country. The crop is hard hit by the drought, considerably reducing the yield. Thus, experts in the zonal agriculture offices and Fedis Agricultural Research Center are concerned that accessing adequate sorghum seed supply may be challenging.
- b) *Unpredictability of weather (climate change):* This renders farming households vulnerable to weather related disasters. There is a reported shifting of the *belg* season into the *meher* season, with the *belg* considered more unreliable as compared to *meher*. This affects the livelihood of the farming communities and their capacity to access seed.
- c) *Restrictive guidelines on seed sourcing from the informal sector for emergency response:* The current emergency seeds response guideline requires that seeds should be procured from identifiable sources, be known varieties, inspected and approved by an authorized body in the region. The guidelines also require that grains harvested from fields planted with the objective of producing seeds, but rejected during inspection, be evaluated and used as seeds for the coming *belg* season. In the *belg* growing areas, the number of seed grower cooperatives and groups are very limited or non-existent in some woredas. Thus, the guidelines appear to be restrictive of accessing seed from informal sources.
- d) *Pests and diseases:* Stem yellow rust on wheat, MLND and smut in maize; blight and spider mites on potato, stem maggots and leaf blight on beans, and cut worms on cereals are all exacerbated by the effect of drought. This constrains the supply of seeds from a number of sources.



- e) *Agricultural water and soil conservation challenges in some areas:* Seed from the informal sector has been negatively impacted by a reduction in the productivity of the land as a result of soil erosion and a continuous cultivation on the same piece of land due to a limit on the amount of land available for cultivation.
- f) *Untimely seeds delivery:* When farmers compared the effectiveness of seed supply through different channels, they reported that cooperative unions and NGOs do not supply seeds on time. As per the farmers view, the local market channel is more effective in timely delivery of seed. However, the latter may provide low quality seeds (mixed varieties and inclusion of weed seeds, which result in the harvest having different heights and different maturity dates, which cause inconveniences when harvesting).

## 5.0 CONCLUSION AND RECOMMENDATIONS

### 5.1 Conclusions

The major crops grown across the *belg* growing areas include maize, barley, wheat, tef, haricot beans, potato and sweet potato, with significant variation in household land holding and area under these crops. Overall, *belg* crop performance was poor in 2015 compared to normal years. Given the poor performance of crops in the last two consecutive seasons, the proportion of farmers who will depend on own-saved seed, local markets and social networks for seed and planting materials in 2016 is expected to significantly reduce as compared to 2015.

The proportion of seed insecure households in the areas studied is high, ranging from 55% - 90% in the assessed zones. This is strongly attributed to the significant reduction of *belg* and *meher* production, limited disposable assets, constrained social capital, progressive increases in grain/seed prices and lack of credit and financial services. As a result, the overall requirement for the emergency seed response for the *belg* growers in the assessed zones is estimated at 6,316 tons of major cereals, 1,941 tons of haricot beans, 8,087 tons of potato and about 231 million cuttings of sweet potato.

The formal sector is expected to supply about 140,051 tons of major cereals, 6,000 tons of major pulses, 884 tons of potato and 29.5 million cutting of sweet potato for the next production seasons. A portion of these seeds could be used for emergency response. There are, however, very limited quantities of seed of the major crops such as beans, tef and barley from this source. Therefore, farmers and any emergency seed response will have to largely rely on the informal sector for these crops.

### 5.2 Recommendations

From the high proportion of seed insecure households as a result of drought in the target region, zones and woredas, there is a need for a concerted action by all the key stakeholders (government, donors and humanitarian organizations) to provide emergency seed assistance to the most affected households. Medium to long term solutions to address seed insecurity problems and challenges should be equally considered.

#### 5.2.1 Immediate actions

- a) *Emergency seed support*: given the magnitude of the drought affected households in the woredas visited, emergency seed support is inevitable. This, however, should be directed to the most affected, seed insecure households in target locations. Given the resource limitations, beneficiaries in the target locations should be selected in a participatory manner in order to identify the neediest households for this response.
- b) *Seed allocation by the regional government*: Considering that the regional government plays an important role in seed allocation even in a normal year, careful consideration need to be taken by the regional government in making such allocations to ensure that a) adequate attention is given to the most affected, b) the right variety and quantity is transported to a particular locality, and c) NGOs work with the Regional BoA and zonal and woreda agriculture in responding to needs for emergency seed response in the affected woredas. Moreover, this should be done in consultation with other key stakeholders interested in emergency seed response. The regional seed inspection and quality assurance section should be consulted.

- c) *Varieties for distribution:* The fact that the *belg* is less reliable due to the erratic and short duration of the rainfall, it is recommended that organizations responding with emergency seed provide mostly short maturing and drought tolerant crop varieties.
- d) *Seed for emergency response from the formal sources:* Seed of adaptable certified varieties, particularly maize, wheat, tef and haricot beans could potentially be sourced from the formal sector (public seeds enterprise, private seed companies, state farms). However, care should be taken when sourcing seed for different agro-ecologies taking into consideration adaptability of varieties and susceptibility of varieties to pests and diseases.
- e) *Informal sector source:* Given the limitation of the formal seed sector in providing seed of crops such as barley and sorghum, procurement of seed from the informal sector is inevitable. This could be done by the unions with technical support from zonal/woreda agricultural offices and seeds inspection and quality assurance body. The fact that there are few seed inspectors in the country or at regional and zonal levels, it would be advisable that the few inspectors train the agronomists at the zonal and woreda levels on procedures for seed inspection and rapid seed quality testing to enable them to support local seed procurement from the informal sources. This will, however, require flexibility in the emergency seed guidelines to ensure quality and adequate supply of seed for emergency response by delegating woreda level agronomists to inspect quality of grain to be purchased for seeds.
- f) The distribution of emergency seed should follow the existing distribution channels: from the cooperative union to primary cooperatives or where this structure is weak, the agricultural office should work closely with NGO partners on the ground.
  - i) *Voucher based seed distribution – empowering the beneficiaries in making choice of input:* Where possible, in order to minimize the logistical challenges that come with direct seed distribution, beneficiaries should be issued with seed vouchers to enable them access the type of seed they need. This could be materialized when seeds are procured and distributed by cooperatives located in the affected kebeles.
  - ii) *Direct seed distribution:* Where only one crop is to be distributed or time doesn't allow for voucher based distribution, direct seed distribution could be applied.
- g) *Complementary input supply and distribution:* Where resources allows, the emergency support should consider providing access to complementary inputs such as fertilizers and pesticides to enhance productivity of the crop. If resources do not allow, alternative mechanisms for creating access to complementary inputs are necessary for optimum benefit from the accessed seed.

#### 5.2.2 Medium/Long-term recommendations

- a) *Promote community based seeds production:* To overcome seed shortages, establish/strengthen existing seed grower groups and/or seed producing cooperatives at the woreda level, and link them with cooperative unions and the private sector (i.e. grain traders that serve as seed distributors or agro dealers) and invest in small-scale irrigation facilities to guard against the risk of crop failure from drought.
- b) *Strengthening the reserve fund:* The communities contacted in Shashemene reported that they contribute to the Disaster Risk Reduction (DRR) fund. This is a government initiative and it is in the right direction in view of DRR with the involvement of the community. However, the initiative is in its infancy stage. The

experiences and challenges need to be documented and shared or scaled up in areas where such initiatives have not yet started.

- c) *Crop and varietal diversification:* In some locations farming households depend on very few crops and/or varieties, hence making them much more vulnerable to climate variability and pending risk from droughts, floods, pests and diseases. Research and extension should put more efforts in developing and promoting new varieties suitable for diverse agro-ecologies.
- d) *Seed insurance:* When possible, along with community based seeds production, the government and NGOs like CRS need to promote seed insurance schemes among seed grower groups in the near future.
- e) *Promoting climate smart agriculture.* A number of *woreda* officials suggested shifting from *belg* production to *meher* production as the *belg* is becoming less reliable. This, however, might not be a long term solution due to the unpredictable climate variability. A longer term option is to promote climate smart agriculture for sustainable seed, food and livelihood security.

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## ANNEXES

Annex 1: Data collection instruments (to reduce report size, tools are not included and will be provided upon request)

Annex 2. Popular improved and local varieties grown by farmers in different locations

Belg Crop	Varieties	Woredas
Barley	Ferke (for belg), Mawugie (for meher); Holker (Malt barley)	Menz Mama Midir
	Sene (for belg), Ginbote (for meher)	Desie Zuria
	Enat-Gebs, Gendit, Wagrie, Tegadime	Kutaber
	Bardo Aifere (for belg), Ehilzer (meher)	Gubalafto
	Tikur Ehilzer, Holker, Tegadime Ehilzer	Wadla
	Locals	Karsa, Meta
H. Beans	Nasir, Dinkenesh, Awash 1	Shashemene/Shalla
	Awash1, Mexcan	Meta
Maize	BH540, BH546, BH660, Jabi (2358), Limu Shomne	Shashemene
	PHP3253 hybrid	Karsa
	Pioneer (shone, jabi)	Gemechis, Tulo
	BH660, BH661	Karsa, Meta, Gemechis, Tulo
	BH540, Melkasa 2, Limu, BH543	Shalla
	Melkassa 1,2,4, 6	Meta, Gemechis,
Potato	White, red	Gubalfto
Tef	Buniye, Adillo, Karaket	Shashemene
	Adillo, CR-37, Kuncho,	Shashemene, Meta, Gemechis
	Kuncho	Meta
Wheat	Digalo	Menz Mama Midir, Kutaba
	Gundip (Danfi), Kakaba	Kutaba
	ET13	Karsa,
	HAR1685	Karsa, Meta
	Pavon 76	Karsa, Meta, Gemechis, Tulo
	Kaqaba	Meta, Gemechis, Tulo
Sorghum	Hamdiye	Karsa, Gemechis
	Muhira	Karsa, Meta
	Abshir	Karsa, Meta, Gemechis
	Gubiye	Karsa, Meta
Potato	Ciro, Gudane	Karsa, Meta

Annex 2– Sampled Woreda Belg Population, Average area, seed rates and emergency seed requirements

Belg Crop	Woredas	Belg HH	% growing the crop	Av. Area (ha/hh)	Av. Seed Rates (Kg/ha)	% Seed Insecure HH	Emergency seed requirements (Tons)
Barley	Menz Mama Midir	9,709	100%	0.88	175	65%	966
Barley	Desse Zuria	19,366	100%	0.38	163	83%	974
Barley	Kutaba	2,772	100%	0.19	200	83%	86
Barley	Gubalfto	3,000	100%	0.58	163	56%	156
Barley	Wadla	6,981	100%	1.00	153	56%	591
Barley	Meta	44,858	65%	0.19	94	61%	311
Barley	Gemechis	16,200	25%	0.13	80	49%	20
Barley	Tulo	17,800	80%	0.16	155	49%	169
H. Beans	Shasemene	28,306	80%	0.50	100	68%	764
H. Beans	Shalla	9,468	70%	1.00	100	68%	447
H. Beans	Tulo	17,800	100%	0.06	62	49%	33
H. Beans	Gombora	11,904	63%	0.65	58	61%	168
H. Beans	Kadida Gemila	14,554	90%	0.19	53	59%	77
H. Beans	Humbo	32,682	100%	0.20	70	76%	343
H. Beans	Dugna Fango	13,335	30%	0.38	95	76%	108
Maize	Raya Alamata	16,817	90%	0.38	43	60%	145
Maize	Shasemene	28,306	75%	0.75	25	68%	269
Maize	Shalla	9,468	100%	1.15	28	68%	202
Maize	Karsa	28,172	40%	0.14	23	61%	21
Maize	Gemechis	16,200	100%	0.38	28	49%	83
Maize	Tulo	17,800	100%	0.09	52	49%	42
Maize	Gombora	11,904	73%	2.10	26	61%	287
Maize	Kadida Gemila	14,554	95%	0.38	26	59%	78
Maize	Humbo	32,682	100%	0.51	25	76%	317
Maize	Dugna Fango	13,335	100%	0.75	25	76%	190
Potato	Gubalfto	3,000	75%	0.13	1600	56%	250
Potato	Karsa	28,172	33%	0.05	2200	61%	557



Potato	Meta	44,858	45%	0.13	1600	61%	2,443
Potato	Gombora	11,904	84%	0.43	1600	61%	4,114
Potato	Kadida Gemila	14,554	75%	0.06	1800	59%	725
Tef	Raya Azebo	21,074	73%	1.50	35	60%	485
Tef	Raya Alamata	16,817	80%	0.48	60	60%	230
Tef	Shasemene	28,306	90%	0.75	35	68%	451
Tef	Shalla	9,468	45%	0.50	30	68%	43
Wheat	Kutaba	2,772	50%	0.13	150	83%	21
Wheat	Meta	44,858	25%	0.13	148	61%	126
Wheat	Gemechis	16,200	50%	0.13	80	49%	40

Belg Crop	Sample Woredas	Belg HH	% growing the crop	Average Area (ha/hh)	Average Seed Rates (Kg/ha)	% Seed Insecure HH	Emergency seed requirements (Million cuttings)
S. Potato <sup>24</sup>	Humbo	32,682	80%	0.09	68000	76%	118
	Dugna Fango	13,335	75%	0.31	47500	76%	112

#### Annex 3a. Seed sources in 2015

Sample Woredas	Belg Crop	Own	SN (F-F)	Union (SE)	Assistance	A-I-dealers	Research	Private	Total
Raya Azebo	Teff	48%	42%	9%	0%	0%	0%	0%	100%
Raya Alamata	Teff	40%	20%	40%	0%	0%	0%	0%	100%
Kutaba	Barley	45%	5%	0%	0%	0%	0%	0%	100%
Kutaba	Barley	75%	0%	0%	0%	0%	0%	0%	100%
Kutaba	Wheat	0%	0%	44%	0%	0%	0%	0%	100%
Gubalfto	Barley	55%	20%	0%	0%	0%	5%	0%	100%
Gubalfto	Barley	15%	10%	15%	0%	0%	0%	0%	100%
Gubalfto	Barley	0%	0%	0%	0%	0%	0%	0%	100%
Wadla	Barley	65%	5%	0%	0%	0%	0%	0%	100%

<sup>24</sup> Cuttings in millions

Wadla	Barley	70%	15%	0%	0%	0%	0%	0%	100%
Shasemene	H. Beans	15%	0%	0%	25%	0%	0%	0%	100%
Shasemene	H. Beans	0%	0%	0%	0%	0%	0%	0%	100%
Shasemene	Teff	5%	0%	0%	0%	0%	0%	0%	100%
Shasemene	Maize	0%	0%	75%	0%	20%	0%	0%	100%
Shalla	Maize	0%	0%	70%	0%	20%	10%	0%	100%
Shalla	H. Beans	35%	15%	0%	0%	0%	0%	0%	100%
Karsa	Maize	67%	13%	21%	0%	0%	0%	0%	100%
Karsa	Potato	75%	10%	0%	0%	0%	0%	0%	100%
Meta	Barley	0	9%	82%	0%	0%	0%	0%	100%
Meta	Potato	0	20%	80%	0%	0%	0%	0%	100%
Gemechis	Maize	54%	18%	28%	0%	0%	0%	0%	100%
Tulo	Maize	17%	21%	42%	0%	0%	0%	0%	100%
Tulo	H. Beans	0%	0%	0%	0%	0%	0%	0%	100%
Gombora	Maize	32%	21%	47%	0%	0%	0%	0%	100%
Kadida Gemila	Maize	0%	10%	90%	0	0%	0%	0%	100%
Kadida Gemila	Potato	25%	0%	0%	0	0%	0%	0%	100%

Annex 3b. Seed sources in 2016

Sample Woredas	Belg Crop	Own	SN (F-F)	Union (SE)	Assistance	A-I_Dealer	Research	LM	Total
Menz Mama Midir	Barley	10%	5%	10%	70%	0%	0%	5%	100%
Desse Zuria	Barley	20%	10%	20%	30%	0%	0%	20%	100%
Kutaba	Barley	0%	50%	0%	50%	0%	0%	0%	100%
Kutaba	Barley	0%	10%	0%	50%	0%	0%	40%	100%
Shashemene	H. Beans	0%	0%	0%	25%	0%	0%	75%	100%
Shalla	H. Beans	15%	15%	0%	50%	0%	0%	20%	100%
Shashemene	Maize	0%	0%	50%	35%	10%	0%	5%	100%
Shalla	Maize	0%	0%	50%	0%	40%	10%	0%	100%
Raya Azebo	Teff	0%	0%	100%	0%	0%	0%	0	100%

Raya Alamata	Teff	20%	5%	70%	0%	0%	0%	5%	100%
Shashemene	Teff	0%	0%	0%	40%	0%	0%	60%	100%
Kutaba	Wheat	0%	10%	0%	50%	0%	0%	40%	100%