SEED SYSTEM SECURITY ASSESSMENT

ETHIOPIA 2016

An assessment funded by:

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Acronyms

CBSP	Community-based seed producer
CoC	Certificate of Competence
CRS	Catholic Relief Services
DSD	Direct Seed Distribution
ETB	Ethiopian Birr
HH	Household
ISSD	Integrated Seed Sector Development
FAO	Food and Agriculture Organization of the United Nations(also UN-FAO)
G	grams
GoE	Government of Ethiopia
Kg	Kilogram
MT	Metric Tons
NARS	National Agricultural Research System
NGO	Non-governmental organization
OFDA	Office of Foreign Disaster Assistance (US Office of Foreign Disaster Assistance. USAID/OFDA
SSSA	Seed System Security Assessment
SVF	Seed Vouchers and Fairs
USD	United States Dollar

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Citation: Catholic Relief Services (CRS), Ethio-Wetlands and Natural Resources Association, Integrated Seed Sector Development (ISSD), Organization for Rehabilitation and Development in Amhara (ORDA), Relief Society of Tigray (REST), and the Ethiopian Catholic Church - Social and Development Coordinating Offices of Meki, Hossana, and Sodo. Seed System Security Assessment in Ethiopia, 2016. Addis Ababa.

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SUMMARY OF KEY SSSA FINDINGS

OVERVIEW : The Seed System Security Assessment (SSSA)

A Seed System Security Assessment (SSSA) was carried out in Ethiopia from September 28 through October 14 2016. The SSSA reviewed the functioning of the seed systems farmers use, both formal and informal, and assessed whether farmers could access seed of adequate quantity and quality in the short and medium term. Specifically, the work reviewed farmers' actual seed sourcing for the Belg 2016 and Meher 2016, and farmers' projected seed sourcing for the Belg 2017.

The work was conducted in four regions, Tigray, Oromiya, Amhara and SNNPR, with woredas chosen to include a range of agro-ecologies, embrace Meher and Belg seasons, examine areas likely affected by El Nino stress, and link to partners' zones of action. While the SSSA assessment was rapid, multiple methods were triangulated and the sample sizes relatively large: 486 household interviews, 46 seed trader/agro-dealer interviews, and community meetings in each selected region. Background papers were also commissioned on: a) the formal breeding sector's structures and processes; b) the formal seed sector; and c) current decentralized seed multiplication and distribution initiatives.

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

- Ethiopian farmers and systems were said to be experiencing the worst drought in 50 years, (comparable to the 1983-5 drought)--- in large part due to El Niño.

- The Government of Ethiopia (GoE) and other implementers had swiftly responded to the crisis, distributing 31,000 MT seed aid during the Belg 2016, and Meher 2016 seasons and with plans for the Belg 2017 still being weighed. The SSSA aimed to help managers and field staff assess whether immediate seed system interventions were on track.

- The field work aimed to build seed system security assessment capacity. Seed security issues are linked to food security issues but also have quite distinct features. *The Seed System Security Assessment (SSSA)* was designed to give honed technical insight and to shape targeted intervention design (Learn more about SSSAs. seedsystem.org).

Salient points—geared to action ---are presented below, across sites, and grouped into short-term issues (***Belg and Meher 2016, Belg 2017***) and medium terms ones (focusing on more chronic constraints and opportunities). Full technical findings and technical summaries appear within the report. Site-by-site data tables are appended.

SALIENT POINTS SUMMARY/REFLECTIONS:
Belg 2016, Meher 2016, Belg 2017

1. During the Belg 2016 and Meher 2016, farmers sourced seed for the two major crops largely from informal seed sources, with a focus on their own stocks and local markets channels (76% seed sourced from informal stocks for the Belg… 73% informal for the Meher.) *This figure is particularly high given that the two priority crops monitored were usually cereals, and these were also the focus of GoE aid: (wheat, maize, barley teff). (Hence, even where there was focused seed aid, farmers mainly used their own seed sources.)*

2. The overall changes in farmers' sowing for the two seasons were modest and within the range of normal: a negative 6.05% for the Belg, and a negative 1.30% for the Meher.

3. Emergency seed aid during these Belg 2016 and Meher seasons provided 20.0 % and 20.2% of the seed sown for the two seasons respectively for the two major crops (as cited by each farmer). *It is not possible to calculate the absolute degree to which this aid was crucial: farmers sometimes preferred to sow the new varieties and certified seed even when they had seed in their own home-saved stocks. Certainly the aid had some positive effect, perhaps in stabilizing sowing rates or allowing farmers to use their money for other key purchases.*

4. Focusing on the potentially vulnerable, that is, those sowing less of a given crop in either the Belg or Meher 2016, three reasons were given as paramount for the reduction. No money to buy seed, insufficient access to land/fields for the season, and simply poor weather-- which kept farmers from wanting to sow full amount of seed for the crop. Lack of seed availability (in markets, shops, with neighbors) figured insignificantly as a rationale for sowing less. A positive development was the fourth major factor cited: use of less seed due to better agronomic practice of sowing in lines. Reasons for reductions were similar across all four regions , with lack of oxen additionally being highlighted in SNNPR.

Note: While giving free seed might help with the finance constraint, such direct seed aid would not have solved the two driving problems for declined seed us-- poor weather and insufficient land/field access.

In terms of sowing less due to money constraints (which will be key for calculation cash/voucher needs), this affected 10.3% of the total population during the Belg 2016 and 6.3% of the total population during the Meher 2016.

5. For crop cases of those 'sowing more than usual', reasons were generally the same as in the Belg and Meher 2016, with slightly different emphasis: better weather for a given crop; more land access, and more seed available due to harvest (8%). Free seed aid was noted as a boost in 6% and 10% of cases for those sowing more, Belg and Meher 2016. In terms of the total population, 1.3% of 1.1% sowed 'more' due to free seed for the Belg and the Meher respectively. (So farmers expanded the area planted- due to free seed.)

6. Seed grain traders, those crucial for seed security in stress periods, assessed supplies the Meher 2016 as normal or above normal, confirmed that normal trading and supply routes were open and calculated that peak prices for potential seed overall rose 18% from Meher 2015 to Meher 2016 (perhaps not a striking rise). In multiple cases, seed/grain traders also became part of the government seed aid procurement process. For most legume and cereal crops (barring wheat and maize), local markets provided 30 to 50% of the seed farmers sowed during these two seasons. *Seed security plans might recognize the key importance of 'potential seed' traders. Such traders could usefully be identified and supported in their quest to gather, transport or identify quality seed.*

7. The amounts of seed bought for the Belg and Meher plantings and its overall costs varied greatly by region, according to land sizes and different crop profiles. For the Belg 2016, seed costs for the three major crops were (in $US) : Amhara $11.7, Tigray $7.4 and SNNPR $5.7. For the Meher , figures were : Oromiya $116, Amhara $8, Tigray $19, for SNNPR $13. *Money constraints should be one of the seed security issues to address but figures need to be tailored by region.*

8. Farmers are getting impressive access to new varieties- but mainly through free distributions with a focus on cereals. Legumes, key for nutrition, are deemed less important in emergency aid and quality seed remains difficult for farmers to access on an ongoing basis. [1]

9. The conflating of emergency and development seed aid may be having negative results: in emergency periods, farmers are not getting the technical back-up they need for use of this new seed; some farmers lament being exposed to inappropriate technology (not wanting to buy hybrids every season); and real seed markets may be disrupted (that is ongoing commercial seed markets)

10. Emergency seed aid is endemic. 1.7 times in 5 years for the general population. Also, direct seed distribution (DSD) is the dominant form. This approach gives farmers little/no ability to strategize in stress periods. Farmers routinely alter what they sow *according to the immediate weather patterns, fields available, or prevailing market prices. Such flexibility might be factored into future support to increase aid effectiveness.*

11. The SSSA did investigate farmers' projections for seed sourcing for the Belg 2017, crop by crop. As the upcoming season was four to six months away at the time of the assessment, such figures must be considered as speculative. Farmers expect to rely on informal channels for the bulk of their seed of two major crops (71% of seed sown). Farmers project overall sowing rates to show a sharp rise : +28%. (!). That said, farmers in the sample have already factored in important government/FAO/NGO assistance for 24% of seed the next season, focused especially on maize, wheat and common bean.

[1] As a concrete example, the Oromo Seed Enterprise distributed 3500 MT of seed in 2016, 96% of it as aid. While 2016 may be an exceptional case, it shows how little call there may be from 'developmental uses'. Also of the 6% allocated for non-aid use, only half of that was actually sold to farers in 2016 in Oromia. (source; Inventory preparation work for SSSA)

SALIENT POINTS SUMMARY/REFLECTIONS:
CHRONIC STRESS ISSUES AND EMERGING OPPORTUNITIES

1. Crop diversification within communities does not necessarily mean that the range of goods (including the nutritious legumes) are being managed for household consumption. Legume sale for cash (rather than consumption) is a trend to be remarked. Also, there was little agro-processing in the communities sampled, resulting in little value addition on site.

2. Seed sourcing strategies were relatively unchanged over a five year period for a range of crops. Changes in key crops such as wheat and maize were frequently linked to higher subsidy (i.e. forms of aid). Farmer Unions and Cooperatives proved important as a seed security source for a narrow range of crops. (Note, they were not effective for the large range of crops farmers routinely use.)

3. Inorganic (chemical) fertilizer was employed by 59% and 88% of farmers for the Belg 2016 and Meher 2016 respectively. Especially for the Belg, farmers noted that it can be risky to use fertilizer as it 'burns the soil if there is a lack of rain'. Fertilizer is mostly applied on maize and teff (Belg) and wheat and teff (Meher) .

4. Most farmers did not report storage losses 2015/16--- as their storage periods seem to be very short and/or little is being stored (and this is an issue that might be examined further). Crops with the highest losses (but < 30%) were reported to be wheat, haricot beans and maize.

5. New variety access within the SSSA sample has been impressive. Within the 'last five years', 78% of households said they had gotten some access to a new variety. However 89% of these new accessions have been of maize, wheat and teff. There has been negligible access to new varieties of any of the legumes, which are key for nutrition.

6. New varieties were also overwhelmingly accessed via government or FAO/NGO channels (74% of cases), rather than through commercial outlets that might serve farmers on a more continuing and sustainable basis.

7. New varieties have also been accessed mainly through emergency aid. This conflating of development with emergency aid is resulting in several concerns raised in the Belg 2016 and Meher 2016 season.

    a. Farmers receiving new varieties through one-off seed aid do not necessarily get the back-up technical support to use that aid effectively. There were multiple cases of those receiving hybrid maize (whose seed should not be resowed). There were multiple cases of farmers recounting a swift decline in 'Panar' (likely a Pioneer variety).

b. Farmer recipients of aid went well beyond those 'most vulnerable' and 'identified by the community'. It included many examples of the better off and those who sought access to new varieties and certified seed. Such certified seed, and new varieties, is hard to access in routine development channels so diverse farmers might seek to be included in the beneficiary group.
c. Select farmers refused seed aid. They refused especially maize due to the common concomitant obligation, or practical pressure, for obligatory fertilizer use and sowing in lines. Fertilizer use comes with a high price and additional economic risk for the family in the event of poor crop performance.

8. Seed aid, that is free distribution of seed as part of emergency response and development initiatives, has been conducted on a large scale, with 70% of the sample having received such aid within the last five years. Aid was received in the general population on average 1.7 times within the last five years, with a high of 7 times. Most of the aid cases were implemented by direct seed distribution (84%), with a few citing seed loans (15% of cases).

Aid methods which allow farmers choice and the ability to strategize, such as cash, vouchers or seed fairs were virtually non-existent for the full sample.

9. The decentralized seed multiplication units examined were limited, and focused on major crops. The need for a full-fledged Certificate of Competence (CoC) may be hampering farmers' access to the range of crops and varieties they need for production, and bolstering resilience and nutrition. Ethiopia has released 365 varieties in the last 10 years and most of these are *not in farmers' hands. Outlets for seed sale are relatively few and pack sizes still generally 'large' (at 50 to 100 kg, with an occasional 20 kg or 12.5 kg unit).*

RECOMMENDATIONS : For The Short-Term

Below find key recommendations that are applicable across all sites. They emerge from an analysis of the field evidence and focus on recommendations in the short-term.

1. **Direct seed aid (distribution) for 2017 should be limited**. There is little evidence of seed unavailability in home stocks and markets, and farmers do not cite seed unavailability as a reason for planting less.

    1.1 To minimize risk. any direct seed distribution might focus on crops and varieties already known and used by farmers in a given region;

    1.2 Direct seed distribution in emergency might best avoid technologies which tie poor farmers into repeated obligations of re-purchase (such as hybrid maize).

2. **Vulnerable farmers should be given means to access seed in Belg 2017 (cash, vouchers, possibly through fairs)**. The major seed-related reason for farmers' planting less had to do with money. This was true for all sites and both Belg and Meher seasons.

    2.1 The amount of any cash/voucher transfer might best to tailored by region as seed costs vary dramatically according to land size and crop profile.

    2.2 As vouchers/cash/fairs also aim to allow farmers to strategize during stress, specific efforts should be made to ensure a wide range of crops are on offer. (also legumes and minor cereals)

3. **Vulnerable farmers might also be given means to access /alleviate other constraints Belg 2017. Vouchers for oxen might be explored specifically in SNNPR. Some analysis of vouchers for field rental might also be considered.**

4. **Support for local markets in this emergency/stress should be considered.** Local markets provided 30 to 50% of the seed sown for all legumes and key minor cereals. Select Seed/grain traders are also already serving to provide emergency seed stocks in key regions.

    - Seed security traders might be usefully identified in each region;
    - Seed security traders might receive support to ensuring a quality product;
        - Training on seed sourcing and selection
        - Possible credit for better storage.

All in all, acute support should address the evidence-based constraints identified.

RECOMMENDATIONS : For The Medium-Term

There is need for more broad-based thinking on how to improve the seed security of smallholder farmers in Ethiopia. Government aid (and repeated aid) is currently the driving production and delivery mechanism for smallholders . As modest areas for wider action, suggestions below are :

1. **Decentralized seed production** needs to become a more strategic and effective force in serving farmers as the formal seed sector will never be able to handle a) the range of crops needed for stress zones; nor b) the range of varieties. At this point, the decentralized seed multiplication initiatives seem to be having modest gains. Those visited had limited crop portfolios and their expansion was hampered by the full-fledged requirement of Certificate of Competency (CoC). As a general recommendation, sustainable decentralized seed production models need to be confirmed many regions of Ethiopia (with ISSD efforts being an important stating point). Decentralized seed production and delivery ill prove particularly important for the legumes and for the vegetatively-propagated crops, especially in SNNPR.

2. **Delivery mechanisms for giving all farmers regular access to new varieties** need to be intensified. Sale through agro-dealers provides only one venue and mainly only for maize and vegetable seed. Farmer Coops and Unions handle a narrow set of crops/varieties. Sale of diverse seed in broader range of outlets, such a regular country stores or open markets might give farmers more access. Sale in smaller pack sizes (1 kg, 2kg 5 kg) may also open up opportunities for poorer farmers to access new varieties and quality seed.

3. **Given that local markets (and their traders) are important for farmers' seed supply, more attention should be given to encouraging that these open seed/grain markets supply the kinds of potential seed farmers want and need on a more consistent basis**— and not just in emergency As one point of departure, seed/grain traders could be powerful partners in helping to move *new modern varieties* widely, within and among farming communities.

4. **Finally, the focus on quality seed for increased production might usefully be broadened to include the goals of 'enhanced resilience' and 'enhanced nutrition'.** A prime focus on cereals alone (the current *de facto* strategy) may not be sufficient to help strengthen farming systems in these times of repeated climate stress and food insecurity.

INTRODUCTION

Rationale for Report

A Seed System Security Assessment (SSSA) was carried out in Ethiopia from September 28 through October 14 2016. The SSSA reviewed the functioning of the seed systems farmers use, both formal and informal, and assessed whether farmers could access seed of adequate quantity and quality in the short and medium term. Specifically, the work reviewed farmers' actual seed sourcing for the Belg 2016 and Meher 2016, and farmers' projected seed sourcing for the Belg 2017.

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Aims and Structure of Report

This summary report presents the results of the SSSA in four regions of Ethiopia September-October 2016. It presents overview findings, with site-by site tables posted as Annexes.

In terms of report structure, Chapter II reviews the SSSA methodology and describes the actual methods used in the September-October 2016 assessment, including the rationale for the choice of sites.

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

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

Annexes post the site-by site assessment locations and key data tables.

II. SEED SYSTEM SECURITY ASSESSMENT: BACKGROUND

This section presents the necessary background to interpret this SSSA. It introduces the concept of seed security and the different types of seed aid approaches that might be matched to diverse seed security problems (and opportunities) encountered on the ground. Methods used in the September/October 2016 Ethiopia SSSA are then described, along with mapping of site locations.

The Concept of Seed Security

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

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

The Dimensions of Seed Security: a Framework

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

Table 2.1: Seed security framework, basic elements

Parameter	Seed Security
Availability	Sufficient quantity of seed of adapted crops is within reasonable proximity and in time for critical sowing periods.
Access	People have adequate income or other resources to purchase or barter for appropriate seeds.
Quality	Seed is of acceptable quality: • 'healthy' (physical, physiological and sanitary quality) • adapted and farmer-acceptable varieties

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

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

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

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

Acute and Chronic Seed Insecurity

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

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

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

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

More Refined Analyses Leading to More Targeted Responses

Table 2.2 gives examples of how identification of a specific seed security constraint should lead to a targeted response, as we are aiming for in this Ethiopia SSSA. So, for example, if 'seed availability' is assessed as the problem in the short term, seed-based interventions, such as seed importation (for acute shocks) may be appropriate. (Seed availability problems rarely persist over the long term.) In contrast, identifying a problem of 'seed access' might wisely trigger a holistic analysis of livelihood strategies. In the acute phase, providing farmers with cash or vouchers to get their desired seed might be effective. However, identifying access problems on a chronic

basis should lead practitioners to look well beyond seed and seed security constraints. The inability to access certain needed goods on a repeated basis is usually equated with problems of basic poverty. Initiatives to help farmers generate income and strengthen their livelihoods would be essential. Seed quality problems, whether they relate to concerns with the varieties or with seed health *per se,* are rarely short-term. Responses usually require significant development programs, linked to plant breeding or seed quality/multiplication initiatives, depending on the specific constraint identified.

Table 2.2: Types of seed security problems and broadly appropriate responses

Parameter	**Acute**	**Chronic**
Unavailability of seed	Direct distribution of seed	(Happens rarely or never)
Farmers lack access to available seed	Vouchers and cash (some times with seed fairs)	Income generation activity Agroenterprise development
Poor seed quality ▪ poor varieties *(variety quality)*	Limited introductions of new varieties (already tested in site)	Introduce new varieties/with technical support Variety selection / plant breeding Participatory variety selection
Poor seed quality • diseased/damaged seed (*seed quality per se)*	Seed fairs with quality controls	Programs to improve seed quality in: - seed companies - on farm (CBSP) -local markets

Seed System Security Assessment

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

Methods Used

The themes and methods used in the Ethiopia SSSA are sketched out in Table 2.3. They include a range of qualitative and quantitative methods and draw on multiple stakeholder insights. Of special note is that the sample sizes were relatively big for a quick assessment: 486 household interviews, 46 seed trader/agro-dealer interviews, and community meetings in each selected region.

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

Type of Investigation	**Commentary**
Background information	Commissioning of specific documents: • formal sector breeding • formal seed sector seed supply trends • Seed production inventory
Key informant interviews	Crop specialists Humanitarian implementers
Focus group discussions --- Community-based **N=4**	Community meetings (c. 150 farmers) • Agricultural and variety use +trends • seed source strategies, by crop • community seed security assessment • crop/seed constraints/opps
Farmer interviews **N=486**	Agricultural trends – acute/chronic stresses seed source patterns/input use
Agro-pharmacists + Traders **N= 46**	• crops + input supplies available on market • pricing patterns/ sourcing areas • seed/grain flows • supply/demand trends

Household sample

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

Of note is that over 60% of households in the sample sowed 1 ha or less.

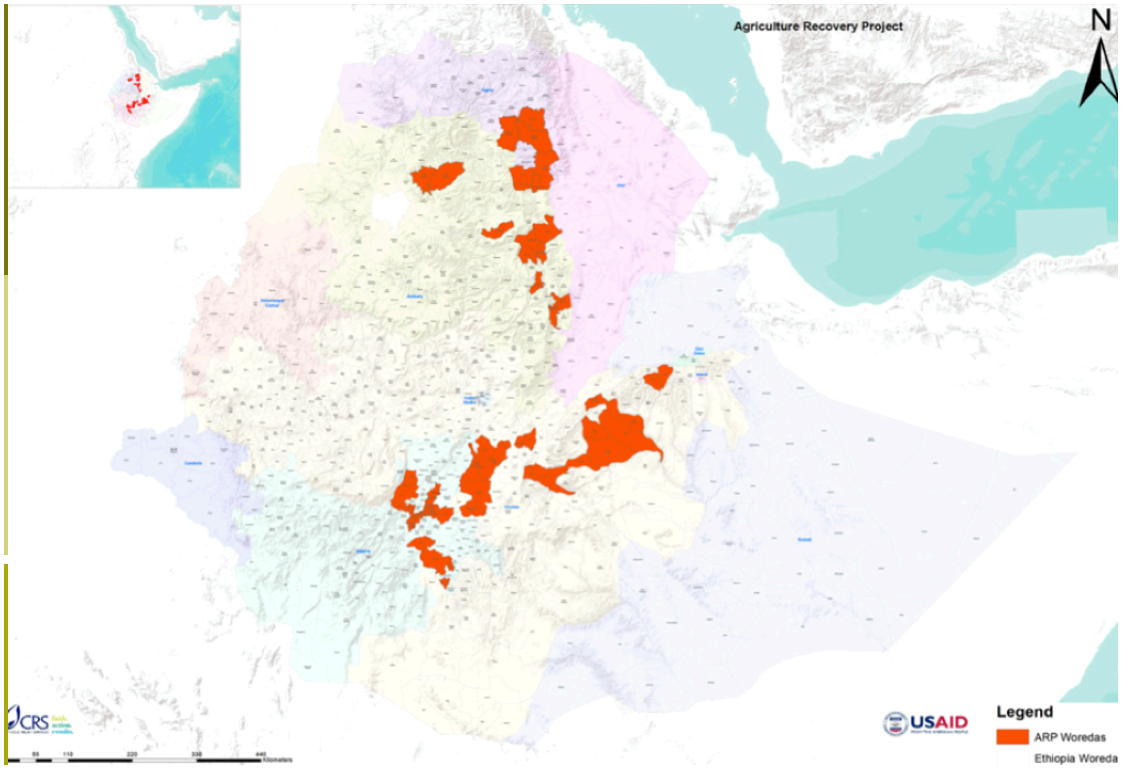
Table 2.4: Ethiopia SSSA (HH) sample characteristics (N =486)

Feature	Description	% Sample
Type of HH	Adult headed Grandparent headed Child headed	**92.5** **6.2** **1.2**
Sex of HH head	Male Female	**84.8** **15.2**
Area cultivated	<0.5 ha 0.5-1.0 ha >1-2.0 ha > 2.0 ha	**24.5** **37.2** **19.0** **19.2**

Site/Woreda Choice

The work was conducted in four regions, Tigray, Oromiya, Amhara and SNNPR, with woredas chosen to include a range of agro-ecologies, embrace Meher and Belg seasons, examine areas likely affected by El Nino stress, and link to partners' zones of action. The general zones of action were ones in which USAID/OFDA funded an Agricultural Recovery Project in 2015/16. (see Annex 1 for location of specific sites.)

Figure 2.1. General geographic location of Ethiopia SSSA zones, September 2016



Seasonal Overview

Of specific note were the seasonal patterns of crop performance around the period of the SSSA Both the Belg 2015 and Meher 2015 were described as deeply affected by El Nino events partly exhibited by one the worst droughts in decades. In fact in one Tigray community (Zala Kebelle) a community group assessed that the severity was comparable to the extreme regional drought of 1984 (Box 1).

In terms of seed security, it is key to analyze stresses crop by its crop to crop effects. Zala community plants only the Meher season and community discussions suggested that the Meher 2015 was devastating to all four key crops—with the current, 2016 season showing variable crop-specific levels of promise (Table 2.5).

Also, it is important to understand what kind of coping mechanisms might be 'routine' and what kind might signal significant stress (Box 2 highlights the issue of livestock sales, which the Zala community explained can be quite routine.)

Table 2.5: Zala community assessment of crop perormance over three Meher seasons *

Crop	Meher 2016 (in the field)	Meher 2015	Meher 2014
Wheat	XX	X	XXX
Barley	XXX	X	XXX
Teff	XX	X	XXX
Fava bean	XXX	X	XXX

* xxx= good. xx= average , x=poor

Box 1. 2015 = Comparable to 1984

In the community of Zala (Tigray), farmers noted that the recent drought was as bad as the globally recognized drought of 1984. Encouragingly, these farmers are managing to plant more in the wake of this weather disaster and have expanded the amount of crops like wheat, teff and chickpea sown during the last Meher 2016 season (Annex II: Tigray site tables). The ability to rebound is a hallmark of resilience and an encouraging trend .

Box 2. Livestock sales: not always a signal of stress.

Reports of sold assets including large and small livestock is often interpreted as a distress signal in the midst of a weather event. We must use caution though in this interpretation. Among many rural vulnerable poor, livestock are a form of capital to be drawn against in times of stress. This stress is often during the lean season when cash is needed for food and to prepare for the next planting season. Minimal levels of selling may simply indicate the need for resources at a given point in time. What is more telling is whether those assets are replenished over time or if there is a continuous erosion of the asset base.

Finally, in terms of timing, it is of considerable note that the Government of Ethiopia (with support from the humanitarian community distributed some 31,000 MT of seed aid for the Belg and Meher 2016 seasons with plants still being weighed for the Belg 2017 at the time of the assessment.

III. FIELD FINDINGS: ACROSS SITES

The fieldwork for the SSSA took place in September/October 2016 after farmers had finished sowing for the Meher 2016 planting season and in good time for them to recall the Belg 2016 sowing trends. The fieldwork also included farmers' projections for the Belg 2017 sowing trends

The SSSA considered two major themes. It assessed the short-term, acute seed security situation, focusing on the immediate Meher 2016 season and recently completed Belg 2016 season. Seed procurement strategies, quantities sown, crop profiles were all analyzed. As the second thrust, the SSSA considered medium-term trends, including possible chronic seed security problems and emerging opportunities. Issues considered included crop diversification, seed sourcing trends, access to new varieties, use of other inputs and seed aid received.

This section presents field findings on seed security across the four assessment site with select site by site data tables are posted in the Annex II . Acute seed security findings are first addressed (Belg and Meher 2016 and projecting Belg 2017- in order) and chronic stress problems and emerging opportunities are then considered. Note that the SSSA centered on the two crops each farmer considered 'most important' (across three seasons) so there may be some under-reporting of secondary crops, which are also key for nutrition and income.

Acute Seed Security Findings, 2016 Belg and Meher

Issues of seed security were first assessed in the short term: how and where did farmers obtain seed for the 2016 Belg and Meher Seasons ? Did they plant a 'normal' quantity of planting material? What do they see as their prospects for obtaining seed the next Belg 2017 planting season? Note that seed system stability and resilience are best assessed by looking at multiple seasons in a row.

Seed sources and quantities planted, 2016 Belg

Table 3.1 and Figure 3.1 show the sources and quantities of seed actually planted by farmers for the main Belg 2016. Information is given in both table and graph form so as to make highly visible the relative use of sources and the scale of seed obtain from each. Several features are of note.

Overall, over 75% of the seed farmers sowed came from local channels, including from farmers' own stocks, the local market, or through social networks of neighbours, friends and relatives. This suggests the importance of informal seed systems as the core seed sources even in times of stress.

A closer look reveals that farmers' own stocks proved key across crops and that the local markets were essential especially for the legumes.

Farmer seed producers, farmers unions and cooperatives and community-based groups most often mobilized by the government, FAO or certain development projects, provided 2.1% of the seed overall, but only for two crops : wheat and Irish potato (with the latter mainly in Amhara. sown within the sample.

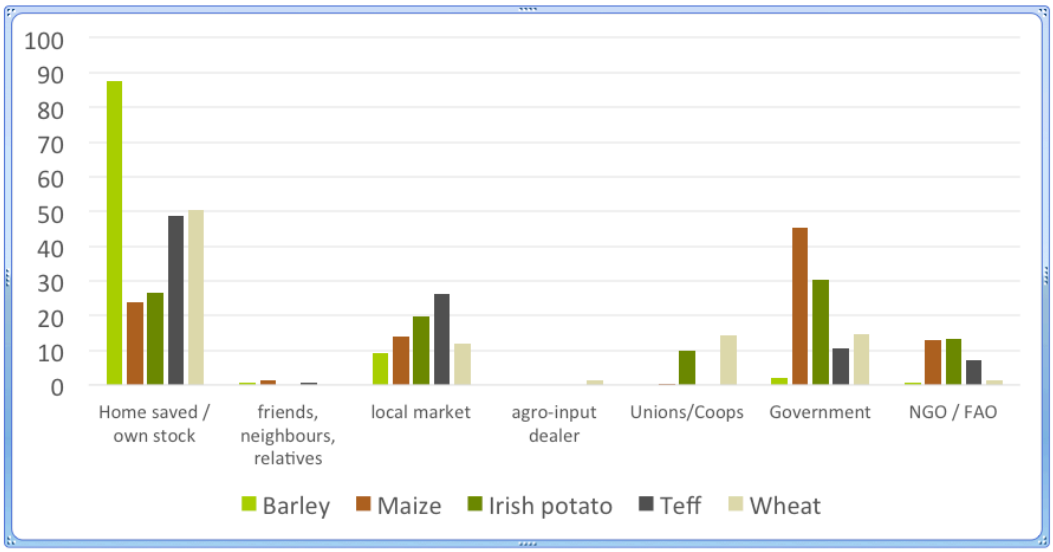
Agro-input dealers provided negligible amounts. They are barely visible in Etihiopia and those that exist focus on maize and vegetable seed.—and in only in select bigger towns. .

Seed aid, provided just over 20% of the seed sown. This figure groups together all aid sources as the Government of Ethiopia (GoE) distributed much of the aid made available from gov't, UN-FAO and NGO sources. It is not possible to determine if all this seed was needed as the assistance given was generally of modern varieties and certified seed—which farmers cannot easily access on their own. Hence, the SSSA identified farmers who had saved sufficient seed in their own stocks, yet who opted to plant the aid.

Table 3.1: Seed (%) planted and sources farmers used, Belg 2016 across three regions

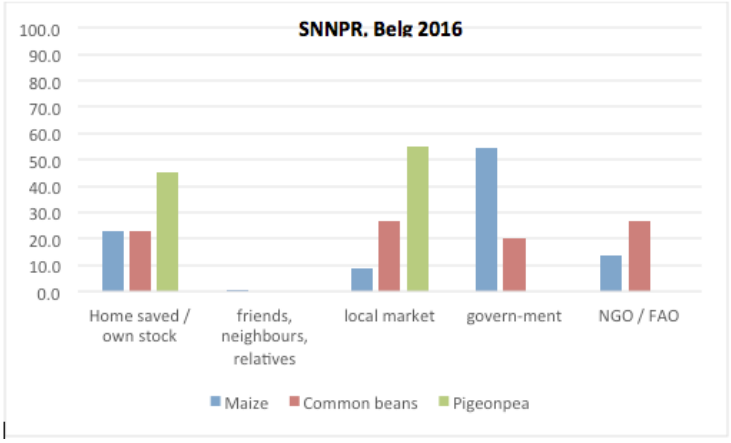
Crop	Total kg sowed	% of total						
		Home saved /own stock	friends, neighbors, relatives	local market	agro-input dealer	Unions/ Coops	Gov't	NGO / FAO
Maize	2400.1	23.7	1.3	14.0		0.2	**45.3**	13.0
Sorghum	10.0	**100.0**						
Millets	7.5	**100.0**						
Irish potato	1510.0	26.5		19.9		9.9	**30.5**	13.2
Haricot beans	583.1	18.7	4.3	**35.9**			16.6	21.8
Pigeonpea	48.8	**45.1**		**54.9**				
Chickpeas	495.6	21.0		**70.0**			2.5	6.5
Onion	5.5	18.2		**81.8**				
Pepper	30.8	**39.3**	**38.7**	22.6				
Taro	13.0	**59.7**	5.8	**33.5**				
wheat	892.5	**50.3**		12.1	1.4	14.4	14.7	1.5
barley	6494.8	**87.7**	0.7	9.0			1.9	0.6
lentil	190.5	**63.0**	5.2	**31.8**				
vetch	12.5			**100.0**				
Teff	901.1	**48.9**	0.7	26.1			10.5	7.0
field pea	192.5	**51.9**		**48.1**				
grass pea	7.5	**40.0**		**60.0**				
Forage	15.0			**100.0**				
TOTAL-all crops	13,811.5	**58.3**	1.0	**17.0**	0.1	2.1	**14.5**	**5.7**

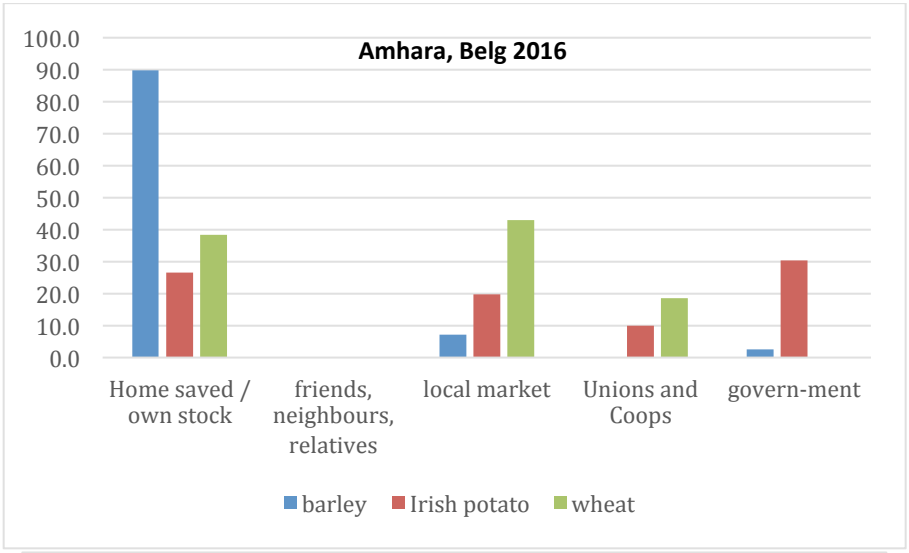
Figure 3.1. Farmers' seed sources Belg 2016 5 major crops . across all sites

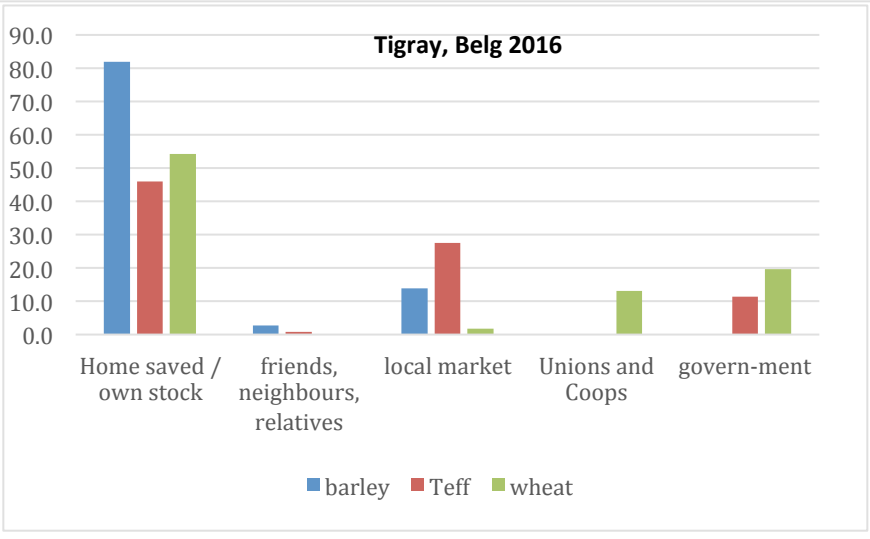


For the Belg 2016, seed sourcing patterns varied slightly across the three sites where Belg was planted. Home stocks and local markets were important across crops. Gov't/ FAO/NGO contributed for wheat and maize—and for Irish potato in Amhara.

3.2 a-c: Farmers' seed sources, Belg 2016, by site







Belg 2016 Were farmers seed-stressed ?

Given these source patterns, were farmers seed stressed? To understand this issue, farmers were asked to compare the Belg 2016 quantities of seed they sowed, by crop, with what they would normally sow during this season. Basically, the question was this: Were the Belg 2016 patterns 'normal' or 'different' from what farmers usually do.

Farmers reported that they, overall, sown quantities across crops had decreased a modest 6.04% (Table 3.2). Crop by crop, farmers planted 'the same amount' or even 'more' in over 60% of cases, with dips particularly marked for the legumes (lentil, common bean, pigeon pea) Of the major crops, Teff sowing rate was up and barley and maize within the range of normal variation. (Particularly as it was a drought year, it was not surprising that maize sowing had dipped--down given that farmers changed to other crops, or simply sowed less to avoid risk)

Table 3.2: Farmers' sowing amounts for Belg 2016 - more, less, or same?

Crop	Number of HHs	% of HHs			Change in sowing quantities for all growing th%e crop
		MORE	SAME	LESS	average % change
Maize	145	8.3	41.4	49.7	***-10.30***
Irish potato	17	23.5	29.4	47.1	***-1.27***
Common beans	64	4.7	35.9	57.8	***-19.52***
Pigeonpea	13	7.7	30.8	61.5	***-26.41***
Chickpeas	22	9.1	72.7	18.2	***-3.90***
Pepper/piment	23	21.7	39.1	34.8	***-6.06***
Taro	20	20.0	40.0	40.0	***-6.58***
wheat	33	9.1	66.7	24.2	***-6.95***
barley	93	9.7	60.2	28.0	***-4.57***
lentil	9	11.1	44.4	44.4	***-17.50***
Teff	68	25.0	50.0	25.0	**12.72**
TOTAL-all crops	**523**	**12.6**	**47.8**	**39.6**	***- 6.04***

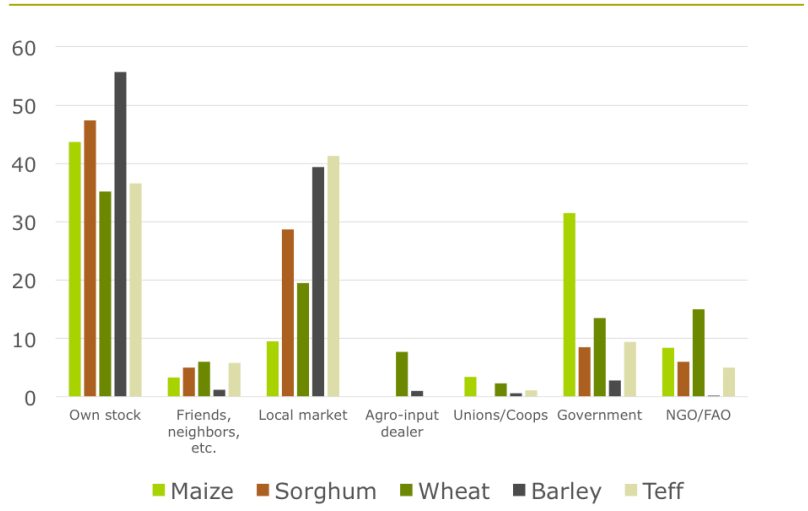
Seed sources and quantities planted, 2016 Meher

The seed sources for Meher 2016 were equally mapped. While large amounts of aid were given, farmers, accessed almost 75% of their seed from local sources (home stocks, markets and neighbors). Aid was important for 20% of the seed sown for several crops (maize, wheat , chickpea, beans). Again, it is not possible to say if all aid was essential as emergency aid was conflated with development aid—that is elite modern varieties + certified seed were distributed.

Table 3.3: Seed (%) planted and sources farmers used, Meher 2016 across four regions

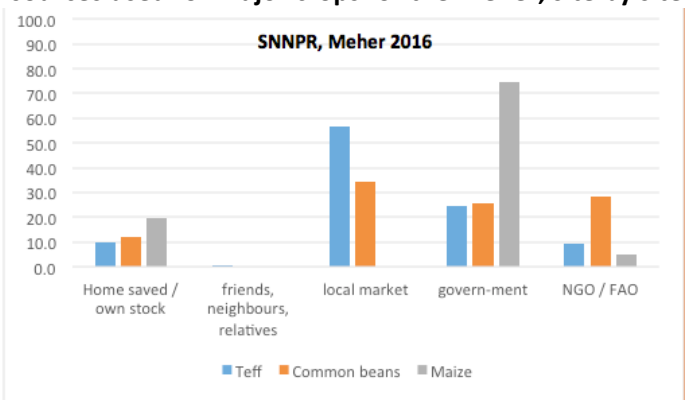
Crop	Total kg sowed	% of total						
		Home saved own stock	friends, neighbors, relatives	local market	agro-input dealer	Unions/ Coops	Gov't	NGO / FAO
Maize	1125.2	**43.7**	3.3	9.5	0.0	3.4	**31.5**	8.4
Sorghum	970.9	**47.4**	5.0	28.7	0.0	0.0	8.5	6.0
Sweet potato	8.4	4.8	**95.2**	0.0	0.0	0.0	0.0	0.0
Irish potato	840.0	**65.5**	0.0	4.8	0.0	0.0	20.8	8.9
Haricot beans	506.1	11.6	2.5	**42.8**	0.0	0.0	20.5	22.5
Chickpeas	305.0	5.2	0.3	**46.3**	0.0	0.0	25.9	22.3
Tomato	1.4	0.0	0.0	**100.0**	0.0	0.0	0.0	0.0
Onion	6.6	0.0	0.0	**57.6**	0.0	0.0	12.1	0.0
Pepper	43.4	**87.6**	1.8	11.1	0.0	0.0	0.0	0.0
Taro	1.6	**92.3**	0.0	7.7	0.0	0.0	0.0	0.0
wheat	23639.4	**35.2**	6.0	19.5	7.7	2.3	13.5	15.0
barley	10131.0	**55.7**	1.2	**39.4**	1.0	0.6	2.8	0.2
faba bean	303.5	**60.5**	6.6	**32.9**	0.0	0.0	0.0	0.0
lentil	324.5	**88.3**	0.0	11.7	0.0	0.0	0.0	0.0
Teff	8869.2	**36.6**	5.8	**41.3**	0.0	1.1	9.4	5.0
field pea	482.0	**66.2**	0.0	**33.8**	0.0	0.0	0.0	0.0
TOTAL-all crops	47558.0	**41.3**	4.6	**28.1**	4.0	1.6	**10.7**	**9.3**

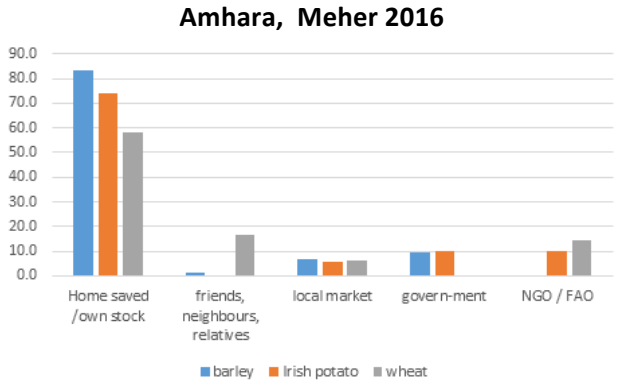
Figure 3.3 Seed sources used for major crops for Meher across four sites

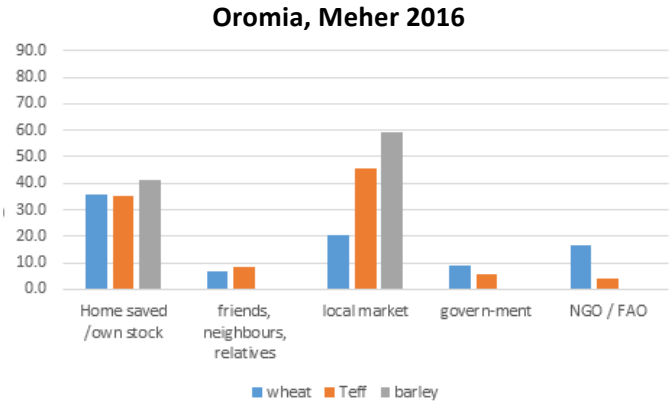


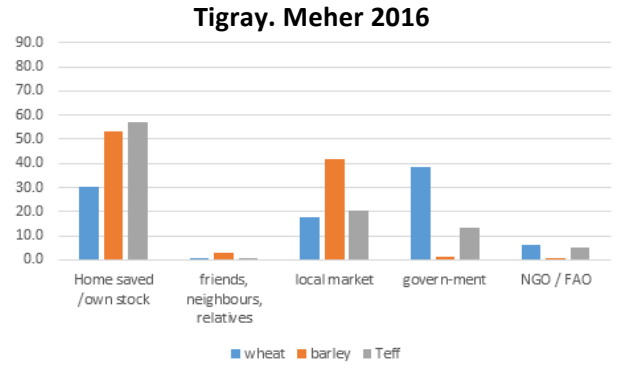
Site-by- site figures on seed sourcing appear below. Home stocks and local markets were key in all regions. Aid (gov't and NGO/FAO) contributed to select crops, especially wheat.

Figure 3.4 a-d. Seed sources used for major crops for the Meher, site by site









Meher 2016 Were farmers seed-stressed ?

To understand, possible Meher stress, farmers were again put in the center of the assessment, comparing Meher 2016 sowing rates with what they would normally sow. Table 3.4 shows that the situation is unusually stable (a modest dip of 1.3%). There is some crop dynamism as would be expected (moving away form maize to sorghum, for instance). Again, the legumes seem the most consistently stressed—and these crops get much less attention than the cereals in aid and development efforts.

Table 3.4: Farmers' sowing amounts for Meher 2016 - more, less, or same?

Crop	Number of HHs	% of HHs			Change sowing quantites for all growing the crop
		MORE	SAME	LESS	average % change
Maize	67	11.9	46.3	41.8	***-3.62***
Sorghum	68	20.6	60.3	19.1	**10.62**
Irish potato	8	25.0	37.5	37.5	**28.33**
Haricot beans	66	16.7	28.8	54.5	***-3.12***
Chickpea	37	13.5	21.6	64.9	***-21.97***
Pepper	13	30.8	46.2	23.1	**9.96**
wheat	187	14.4	43.9	41.7	***-1.21***
barley	117	17.1	47.9	35.0	**1.67**
faba bean	15	6.7	40.0	53.3	***-22.68***
lentil	10	30.0	20.0	50.0	**8.31**
Teff	283	19.1	35.3	45.6	***-3.65***
field pea	21	14.3	47.6	38.1	**23.93**
TOTAL-all crops	**905**	**17.2**	**41.0**	**42.4**	***- 1.30***

Both seasons 2016 : Belg and Meher. Seed quality and yields

Sowing amounts and sowing trends present only part of the picture and the SSSA looked at data on seed quality and yields below.

Seed quality for both Belg and Meher was overwhelmingly evaluated by farmers as good (85-90% cases) or average (10-12%). While formal specialists may lament farmers own seed quality, the Ethiopian farmers sampled shared a very different assessment, whether seed was sourced from the government, own stocks or even local market (Table 3.5).

Table 3.5: Farmers' assessment of seed quality by crop and source Belg and Meher 2016

Source	BELG 2016 %			MEHER 2016 %		
	Good	Avg	Poor	Good	Avg	Poor
Home saved /own stock	87.8%	10.6%	1.6%	82.7%	14.4%	2.9%
Friends, neighbors,	84.6%	15.4%	0.0%	100.0%	0.0%	0.0%
Local market	85.6%	14.4%	0.0%	82.0%	15.2%	0/0%
Agro-input dealer	100.0%	0.0%	0.0%	100%	15.1%	3.0%
Unions/Coops/Comm groups	100.0%	0.0%	0.0%	75.0%	0.0%	0.0%
Government	89.8%	7.1%	3.1%	91.2%	7.7%	1.0%
NGO / FAO	94.4%	5.6%	0.0%	93.4%	4.5%	2.0%
total	88.5%	10.1%	1.4%	85.4%	12.3%	2.3%

On the yields, farmers assessed their results as good or average in 70-80% of cases (recognizing that the Meher crop was still in the field during the assessment period). Crop by crop data is below. The legumes, again were those with the lowest figures.

Table 3.6: Farmers' assessment of yield, crop by crop, Belg and Meher 2016

Crop	How was yield?					
	Belg%			Meher %		
	Good	Average	Poor	Good	Average	Poor
Maize	48.2	19.9	37.7	48.7%	22.4%	**28.9%**
Sorghum	-	-	-	71.1%	27.6%	1.3%
Sweet potato	-	-	-	50.0%	50.0%	0.0%
Irish potato	89.5	10.5	0	55.6%	22.2%	**22.2%**
Haricot bean	55.6	22.2	22.2	45.3%	24.0%	**30.7%**
Chickpea	52.2	26.1	21.7	20.9%	30.2%	**48.8%**
Pepper	52.6	42.1	5.3	81.8%	18.2%	0.0%
Taro	35.0	40.0	25.0	75.0%	0.0%	**25.0%**
wheat	30.3	9.1	60.6	46.0%	31.6%	**22.4%**
barley	22.2	27.4	50.5	48.5%	33.6%	17.9%
faba bean	-	-	-	53.3%	33.3%	13.3%
lentil	25.5	37.5	37.5	66.7%	11.1%	**22.2%**
Teff	55.9	25.0	19.2	54.0%	25.5%	**20.5%**
field pea	0.0	38.3	66.7	40.9%	27.3%	**31.8%**
TOTAL-all crops	**48.0**	**23.8**	**38.3**	**50.8%**	**27.7%**	**21.5%**
TOTAL observations		**568**			**1132**	

Focusing on potential problems areas and spurring production

Potential problem areas Belg and Meher 2016

The relatively stable situation for Belg and Meher 2016 should not obscure that there have been vulnerable farmers who may need critical and tailored support. In each season, an important number of farmers were sowing less of a given crop (Tables 3.2 and 3.4). To understand more clearly the nature of this decline, farmers were asked to explain, crop by crop, why the decline in seed use.

Focusing on the potentially vulnerable, that is, those sowing less of a given crop in either the Belg or Meher 2016, three reasons were given as paramount for the reduction. No money to buy seed was the major seed-security linked reason (14.8% and 23.4% of the reasons given), (Table 3.7). Note that lack of seed availability (in markets, shops, with neighbors) figured insignificantly as a rationale for sowing less (<1% of cases). Poor quality seed or varieties were also not real deterents.

The major reasons for sowing less, in both the Belg and Meher 2016 had nothing to do with seed. Many farmers had insufficient access to land/fields for the season (as borrowing or renting land is common). Most important was the poor weather - which kept farmers from wanting to sow full amount of seed for the crop.

> *Note: While giving free seed might help with the finance constraint, such direct seed aid would not have solved the two driving problems for declined seed us-- poor weather and insufficient land/field access.*

A positive development was the fourth major factor cited: use of less seed due to the agronomic practice of sowing in lines. Such a technique allows them to economize on seed (so get the same or better yields—for less seed).

Reasons for reductions were similar across all four regions , with 'lack of oxen' additionally being highlighted in SNNPR (see Annex II for site-specific tables).

Table 3.7 Reasons farmers gave for sowing less than normal In Belg and Meher 2016

Reasons	Belg % responses	Meher % responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
No seed available in market/trader/agro-phramacy	0.5	0.8%
No seed/cuttings available from neighbors	0.5	0.5%
Seed access		
No money to buy seed/poor finances or seed too high	14.8	**23.4%**
Seed quality		
Seed available is not good quality or the variety is not liked	2.5	1.3%
Sub-total: seed-related	**18.2**	**26.0%**
NON-SEED FACTORS OF PRODUCTION (limits)		
No/insufficient labor	3.0	3.7%
Illness/health problems	2.0	3.1%
No/insufficient land or land not appropriate/sufficiently fertile	20.2	**16.0%**
Lack of tools/tractor/ other machinery to farm	4.9	2.4%
Plant pests/diseases make production not possible	1.5	0.8%
Animals/predator make production not possible	0.0	0.0%
Lack of other inputs: controlled water supply/irrigation or fertilizer	0.5	1.0%
Low quality of inputs: eg. Fertilizer, herbicides, pesticides	0.0	0.0%
Price of inputs is too high	0.5	0.5%
Poor weather/rainfall	36.9	**25.7%**
Insecurity (e.g. theft)	0.0	0.0%
Sub-total: Factors of Production	**69.0**	**53.3%**
OTHER PRIORITIES/STRATEGIES		
Markets for crop or crop products not well-developed	0.0	0.3%
Other priorities than agriculture (e.g. have shop). Changing crop priorities	2.5	4.5%
Other	9.9	14.7%*
TOTAL	**99.3**	**98.7%**

* many of these answers had to do with sowing in lines

The real seed security-linked issue: Money

In reviewing seed security constraints across the seasons (Belg and Meher 2016), it emerges that the major seed-linked reason for farmers planting less of a crop has to do with money, that is, not having the resources to buy additional seed. To give specific insight, the amount of money needed for buying seed for three key crops for the Meher 2016 appears below (Tables 3.8 a-d). The total amount proves valid only if a single household invests in all three crops. Also, these

averages mask individual variations but do give an indications of typical outlays for seed. Note that the amounts of seed bought for Meher plantings and its overall costs varied greatly by region, according to land sizes and crop profiles and especially seeding rates (see Box 3) For the Meher , figures were in USD were : Oromiya $116, Amhara $8, Tigray $19, for SNNPR $13.

Not shown are figures for the Belg 2016, in $US : Amhara $11.7, Tigray $7.4 and SNNPR $5.7,

Box 3. Farmer's view on high seed rate in Oromia region: a mitigation mechanism

Ato Geleta possesses 1.5 hectares of land in Ibsata Kebele, Sire woreda, Oromia region of Ethiopia. He grows wheat, faba beans, and maize among others. He has his views and experience on high seed rates of wheat/hectare as follows:

"The development agents (DAs) told us about the importance of mineral fertilizers and the right seed/fertilizer rate combination per hectare. According to their recommendation, we should use 100kg of wheat/hectare. We have tried their advice, but it didn't work for us. We have heard that their suggestion works in highland *kebeles* but not in our own which is a lowland area with a moisture stress. We use 200 kg of wheat/hectare to ensure the seed we plant survives the moisture stress and unreliable rainfall conditions. It is a mitigation mechanism towards uncertain and unpredictable rainfall.

The data suggest that money constraints should likely be one of the seed security issues to address in assistance but figures need to be tailored by region.

Tables 3.8, a-d: Money calculations for seed purchases of three major crops, by site, 2016

a. Oromia site – Sire and Dodota Woredas.

most important crops	N growing this crop	Meher Average Spending Birr				
		Neighbors	local market	input shops	All sources	% of total
Teff	81	52.47	830.25	0.00	**882.72**	**34.6%**
wheat	93	116.61	553.26	0.00	**669.87**	**26.3%**
barley	24	0.00	998.25	0.00	**998.25**	**39.1%**
total (of 3)	198	**169.08**	**2381.75**	**0.00**	**2550.84**	**100.0%**

b. Amhara site – Dessie Zuria and Teluwodere Woredas

most important crops	N growing this crop	Meher Average Spending Birr				
		Neighbors	local market	input shops	All sources	% of total
Teff	55	1.82	9.20	0.00	**11.02**	**6.5%**
wheat	26	9.09	12.72	0.00	**21.81**	**12.8%**
field pea	19	0.00	137.26	0.00	**137.26**	**80.7%**
total (of 3)	100	**10.90**	**159.19**	**0.00**	**170.09**	**100.%**

c. Tigray Site

most important crops	N growing this crop	Meher Average Spending Birr				
		Neighbors	local market	input shops	All sources	% of total
Sorghum	64	0.00	43.55	0.00	**43.55**	**10.5%**
wheat	68	0.00	97.24	2.21	**99.45**	**23.9%**
barley	46	0.00	272.99	0.00	**272.99**	**65.6%**
total (of 3)	178	**0.00**	**413.79**	**2.21**	**415.99**	**100.%**

d. SNNPR Site

most important crops	N growing this crop	Meher Average Spending Birr				
		Neighbors	local market	input shops	All sources	% of total
Teff	96	0.94	183.33	0.00	**184.27**	**63.5%**
Common beans	60	0.00	22.97	0.00	**22.97**	**7.9%**
Chickpeas	34	0.00	83.06	0.00	**83.06**	**28.6%**
total (of 3)	190	**0.94**	**289.36**	**0.00**	**290.30**	**100.%**

In terms of the overall SSSA sample , money constraints were linked to sowing less for 10.3% of the total population during the Belg 2016 and 6.3% of the total population during the Meher 2016. (Such a figure could be key for calculating assistance needs.)

Spurring production Belg and Meher 2016

To complete this analysis of the rationale for farmers' planting decisions, the SSSA pursued a positive trend: why those who planted more did so (Table 3.9) . Households planted more for multiple and diverse reasons especially getting access to more land, seizing on better weather opportunities and have more seed due to strong harvest . Getting free seed also did make a difference, especially for crops such as sweet potatoes where access to cuttings can be a problem (and for wheat and maize).

Free seed aid was noted as a boost in 10% and 6% of cases for those sowing more, Belg and Meher 2016, respectively.

In terms of the total population, 1.3% of 1.1% sowed 'more' due to free seed for the Belg and the Meher respectively.

Table 3.9: Reasons farmers gave for sowing MORE than normal Belg and Meher 2016

Reasons	Belg % responses	Meher % responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
More seed available due to good harvest	8.8	8.2%
More seed available due to free seed	10.3	6.3%
Seed access		
More money to buy seed or seed price low	1.5	0.6%
Got credit to buy seed	0.0	0.6%
Vouchers (or NGO-provided cash)	0.0	0.6%
Seed quality		
Have especially good seed or good variety	2.9	6.3%
Sub-total: seed-related	**23.5**	**22.6%**
NON-SEED FACTORS OF PRODUCTION (opportunities)		
Good/increased labor	2.9	1.9%
Feeling strong/healthy	1.5	0.0%
Have more land/more fertile land	16.2	15.1%
Have tools/tractor, other machinery to help farm	0.0	0.0%
Have access to irrigation, fertilizer or other inputs	1.5	0.6%
Good weather/rainfall	32.4	34.6%
Good security	0.0	0.0%
Sub-total: Factors of Production	**54.4**	**52.2%**
OTHER PRIORITIES/STRATEGIES		
Well-developed /new markets for crop or crop products	2.9	3.1%
Have decided to give more priority to agriculture/ Changed crop priorities	4.4	8.2%
Other	10.3	11.3%
TOTAL	**95.5**	**97.5%**

Could the markets deliver seed Meher 2016?

Agro-dealer outlets and networks are just starting to be catalyzed in Ethiopia, with outlets located in very few towns (e.g. Adama) and mostly providing bags and packets of hybrid maize and vegetable seed solely. Hence, the market analysis focused on the local seed/grain markets, where farmers scout out grain that is suitable for planting material. The issue is whether the markets could deliver the volumes of seed farmers needed in Meher 2016 (to supplement their own stocks).

To be clear, much that is sold in local markets is used for grain (for consumption, for livestock feed, for brewing). However, there is a special subset of this grain which can potentially also be used for seed and which is actually sown. This subset might be referred to as 'potential seed'. Both farmers (buyers) and traders (sellers) use a range of strategies to access 'good' seed from the seed/grain markets. For the buyer, he/she wants to maximize the possibility that the product bought will actually grow on his/her own farm. For the seller, he/she wants to tap into a lucrative seed market, whose prices prove higher than those obtained from routine food grain alone. Box 4 gives a concrete example of how one trader in the Arsi zone aims to capture this potential seed market.

Box 4. Higher prices for seed in local markets: a signal of traders' – and farmers' – attention to quality

AL (pictured) is a medium-sized trader in the town of Dera, the main market town for Sire and Dodota Woredas in Arsi Zone. From his store facing the market, he has been buying and selling wheat, maize, teff, and beans for many years, sourcing his purchases from the surrounding region, but also further afield (Bale, Adaama, Wollega) in difficult times. During planting time, AL also sells potential seed. For this 3-month period, he reckons seed sales make up 20% of overall sales in a good season, and an even higher proportion in a dry year, when more farmers turn to local markets to meet seed needs. AL takes this task very seriously: "*We have a family relationship to farmers,"* he says, while he attends to a cash loan to a farmer, confirming such close ties. "*We've been in this business a long time, and we need to look after our reputation."* So, AL identifies good producers during the growing season and arranges to buy their harvest. This is further selected and sold specifically for seed, at a higher price than grain. How much higher, we ask? Depends on which variety, he replied, naming specific wheat and teff varieties and patiently explaining how different varieties may have different market prices – but all the stock selected and sold as seed is more expensive than that sold for grain, as the table below shows.

CROP	Grain price (food)	Seed price (less desired varieties)	Seed price (most desired varieties)	Margin
Wheat	7.5 ETB / kg	8 to 8.5 Birr / kg	9.5 ETB / kg	+27%
Teff	18 ETB/kg	20 Birr / kg (red and white mixed)	21 ETB / kg (white)	+17%

Local seed/grain market-supply Meher. 2016

Local seed/grain markets were noted in ths SSSA as particularly important for the legumes (haricot beans, chickpea, faba bean , lentil and field pea) and for the cereals (especially barley, teff and sorghum). In the Meher 2016 sample, local markets provided between 30-50% of the seed sown for each of the six crops just cited (see Table 3.3). So they were used in practice, and extensively.

How did traders themselves, from their supply side, assess the functioning of the markets during the Meher 2016? If seed availability were a constraint, one would expect seed supply to decline, and prices to rise steeply. Here, the evidence from the SSSA presents a nuanced picture.

Table 3.10 summarizes trader's assessments of Meher supplies from one year to the next, presumably, from a normal season to a stressed one. The number of crop specific observations was relatively large (over 100) and from traders across the four assessment regions. For each major crop, the majority of potential seed traders interviewed indicated the seed supply as generally being either normal or greater than usual.

Table 3.10: Traders assessment of potential seed supply – Meher 2016 v Meher 2015

Crop	# traders	Normal or More	Less
Wheat	10	56%	44%
Barley	5	60%	40%
Teff	28	61%	39%
Common beans	5	75%	25%
Sorghum	21	76%	24%
Maize	23	78%	22%
Faba bean	3	100%	0%
Grass pea	3	100%	0%
Trader observations	**103**		

Perhaps even more tellingly were traders' price comparisons, again contrasting Meher 2016 with Meher 2015. Traders indicated modest average increase in seed prices across all crops (+18%), with crop –specific analyses showing variable trends. Sorghum rose 27% and teff rose 23% in price from Meher 2015 season, while the price of wheat fell by 3% (Table 3.11). Overall these prices hikes seem to fall within a range of normal variation, and do not immediately signal extreme stress.

Table 3.11: Average Peak Price per Quintal- as per traders assessment

Crop	N traders	Meher 2015	Meher 2016	% Change
Sorghum	21	812	1031	27%
Teff	28	1797	2209	23%
Common beans	5	740	870	18%
Barley	5	832	920	11%
Maize	23	560	582	4%
Faba bean	3	1633	1600	-2%
Wheat	10	1025	997	-3%
Grass pea	3	1627	1450	-11%
Total	98			**18%**

Finally, on the supply side, it is important to signal that traders in several of the assessment regions were called in by the GoE to supply seed (from local sources) for the official emergency seed aid distribution. Four traders in Korem (Ofla), Tigray for instance, supplied the government (based in Korem) with 200 MT (2000 quintals) of chickpea and barley which they sourced both locally and from other adapted regions. Specific varieties were sought out and the seed was inspected by the government purchaser (Figures 3.5 and 3.6).

Figure 3.5. Actual chickpea potential seed flows Meher 2016

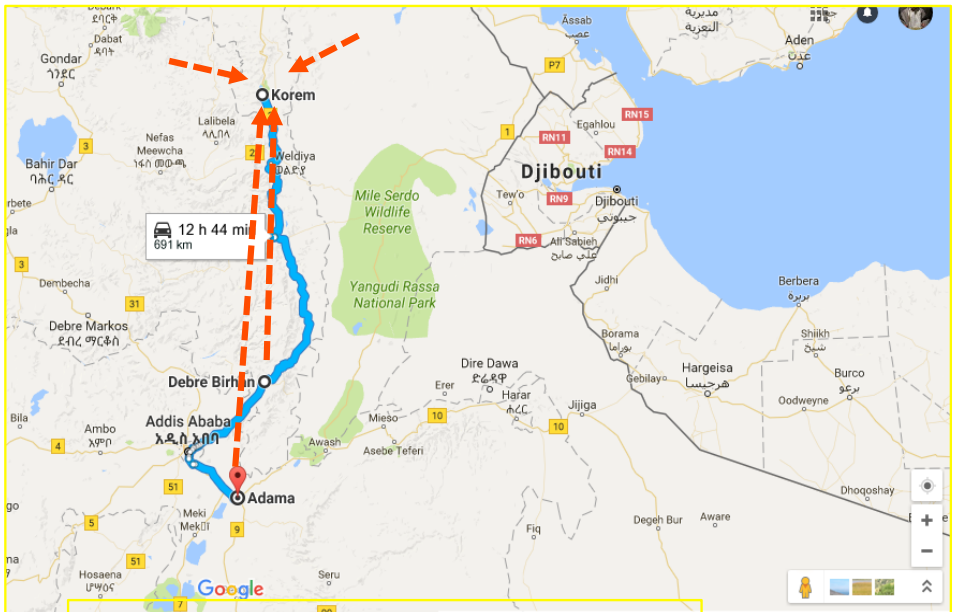
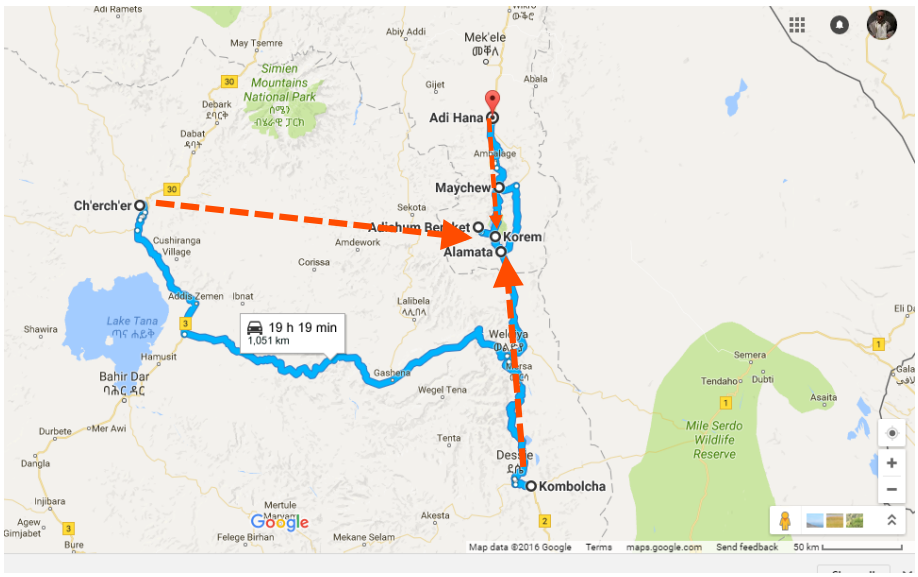


Figure 3.6. Actual Barley potential seed flows Meher 2016



So, in brief, seed/grain market assessments showed potential seed to be immediately available in each area or accessible from clearly defined other adapted areas. Also given that such seed/ grain traders are crucial for seed security in stress periods (including for crops not easily available from the formal system) s*eed security plans might more explicity recognize the key importance of 'potential seed' traders. Such traders could usefully be identified and supported in their quest to gather, transport or identify quality seed* (Box 5)

Box 5. Seed/grain traders: a vehicle for change ?

While aid organizations often must perform logistical feats to move commodities in time for planting season, medium to large traders already have a firm grasp on what it takes to move in-demand items quickly. Using existing trader networks, four traders in Ofla moved quickly to meet the woreda demand for chickpea and barley seed (totaling more than 200 MT). The seed was verified to be good quality from harvest to delivery - one of the traders who is a farmer himself, checked the seed in the field and in the bag and verified that it was the right variety for the location. Existing channels such as this offer a potentially lower cost and more responsive option to get farmers what they need.

Seed sources + quantities to be planted: moving forward, Belg 2017

Finally, in terms of upcoming seasons, projections for seed sourcing for the Belg 2017 were a obtained, crop by crop. As the upcoming season was four to six months away at the time of the assessment, such figures are but speculative. Major points for the Belg 2017 projections are:

Farmers expect to rely on informal channels for the bulk of their seed of two major crops. 71+% of the seed to be sown is projected to come from own stocks 58% and markets 12%. (Figure 3.7).

Farmers project overall sowing rates to rise sharply: +28% (Table 3.12) (showing an optimism).

Noteworthy is that farmers have already factored in important government/FAO/NGO assistance for 24% of seed the next Belg season, focused especially on maize, wheat and haricot bean, and seeking free certified seed. For the other crops, they are counting on general self-sufficiency.

It appears that 'Emergency Seed Aid' is be becoming a recognized standard source of seed-- for a good number of smallholder farmers.

Figure 3.7. Farmers' Projected seed sources Belg 2017

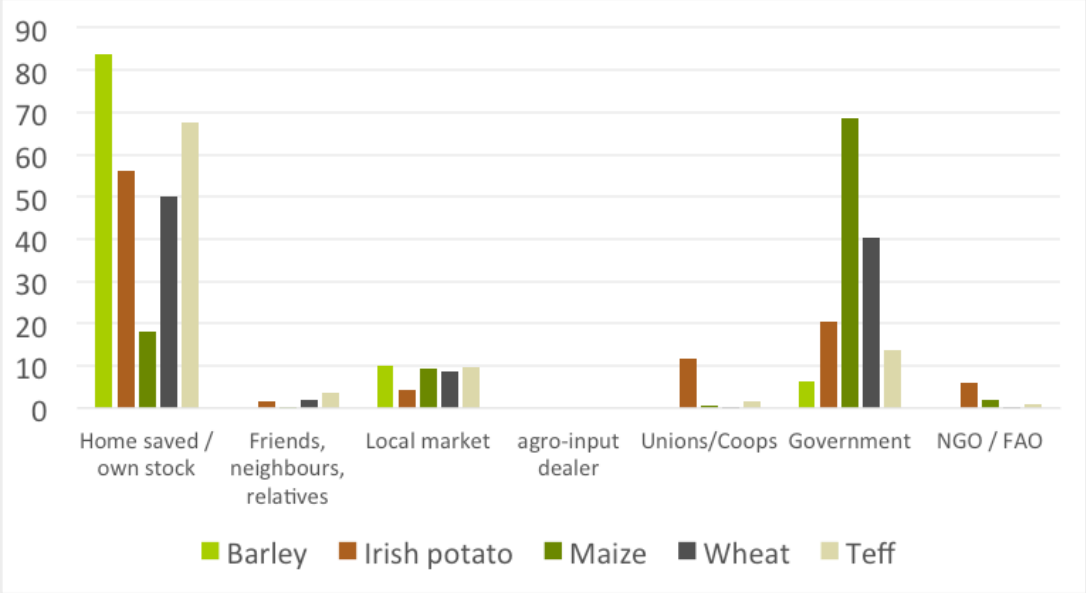


Table 3.12: Farmers' projected sowing amounts for Belg 2017 - more, less, or same as normal

Crop	Number of HHs	% of HHs			Change sowing quantites for all growing the crop
		MORE	SAME	LESS	average % change
Maize	158	39.2	46.8	13.3	**31.00**
Irish potato	25	52.0	44.0	0.0	**84.72**
Haricot bean	66	51.5	34.8	13.6	**67.90**
Pigeonpea	15	46.7	53.3	0.0	**73.33**
Chickpea	30	16.7	63.3	20.0	**5.20**
Onion	10	40.0	60.0	0.0	**33.33**
Pepper	22	36.4	54.5	9.1	**30.71**
Taro	22	31.8	54.5	13.6	**5.32**
wheat	46	19.6	73.9	6.5	**36.86**
barley	96	11.5	62.5	26.0	***-2.25***
lentil	9	11.1	55.6	33.3	***-9.26***
Teff	86	20.9	59.3	19.8	**20.56**
field pea	15	20.0	40.0	40.0	**8.04**
TOTAL-all crops	**614**	**30.3**	**55.2**	**16.0**	**27.77**

Summary: Acute Seed Security Findings

Despite the initial shock (or shocks) diverse indicators suggest the seed security of Ethiopian farmers in the four separate regions has been stable for Belg 2016 and Meher 2016—and is projected as significantly recovering for the Belg 2017 season.

Belg 2016

1. For Belg 2016, despite important injections of aid seed aid distributions, farmers sourced the lion's share of seed, 80%, on their own (focusing on each farmer's two most important crops). The two major seed source channels were informal sector ones: home-saved stocks (58%) and seed from local markets (17%).

2. The quantities sown were in the range of normal (an overall dip of -6.0%). The quality of seed by farmers was assessed as good or average (an overwhelming 99% of responses). Even though it was a stressed period, crops yields were also rated by farmers as good (43% cases) or average (24% cases) so 2/3 of farmer crop cases had acceptable yields for their crops—even during the drought. The 1/3 cases of poor yields reported varied by crop and region. Interestingly, poor yields were reported at relatively the same frequency for seed sourced from a) seed aid (government and FAO/NGO), b) home stocks and c) from local markets. (Note that the final report has crop by crop analysis. Cases of maize, common bean taro, barley all figure within the poor yield set).

3. Focusing on the potentially vulnerable, that is, those sowing less of a given crop in Belg 2016, three reasons were given as paramount for the reduction. No money to buy seed (15% of responses), insufficient access to land for the season (20% of responses) and simply poor weather (37%)-- which kept farmers from wanting to risk sowing full amounts of the crop. Lack of seed availability (in markets, shops, with neighbors) figured insignificantly (less than 1% of responses). A positive development was the fourth major factor cited: use of less seed due to better agronomic practice of sowing in lines. All four Regions gave similar reasons for reductions, with lack of oxen additionally being highlighted in SNNPR.

Note: While giving free seed might help with the finance constraint, such direct seed aid would not have solved the two driving problems for declined seed use-- poor weather and insufficient land/field access.

No money to buy seed will be key for calculating cash/voucher needs. The percent of the **total population** having this constraint for the Belg was 6.3%

Calculated seed costs by household for the three major crops for the Belg were as follows. Amhara 258 Birr ($US 11.7); Tigray 163 Birr ($ US 7.4) and SNNPR 126 Birr ($US 5.7).

4. For those 'sowing more than usual', the responses 'having access to more land' and 'good weather/rainfall' were the most important positive factors (16 and 34% of responses respectively). Some farmers also cited increasing seed use due a prior good harvest and more seed available (9% responses). Finally during the Belg, gifts of free seed (aid) helped

farmers expand selected crop use (10% of cases when sowing more). So aid was a positive factor but not driving factor one among the general population.

In terms of the total population surveyed, free seed (aid) helped farmers increase sowing rates for, 1.3% of **farmers in the Belg 2016.**

Note: In thinking about seed use and need in all regions surveyed, amounts farmers sowed seem to depend to a marked degree on the last minute weather patterns and a fluctuating access to land/fields, from one season to another. These seem to drive farmers' sowing amounts, not whether seed was on hand.

Meher 2016

Farmer point of view: demand and seed use issues

The Meher 2016 was projected to be a more stressed period than the Belg 2016 with even larger amounts of seed aid given. The general seed security quantitative findings were similar, although explored more in depth: It was during Meher 2016 that the SSSA fieldwork unfolded in real-time, with households and markets being equally central foci.

5 For Meher 2016, farmers sourced ¾ (74%) of seed on their own (focusing on each farmer's two most important crops). The main difference from the previous Belg 2016 season was in the increased use of local markets, 28% from this single source (versus 20% from combined government, FAO and NGO aid).

In stress periods, local markets tend to be the source for combatting seed insecurity and for obtaining the range of crops/varieties to bolster resilience. Local market support might merit greater attention.

6 The quantities sown hovered directly around normal (with an overall dip of just -1.30%). The quality of seed by farmers was assessed as good or average (98% of responses). Yield obtained or to be obtained was deemed promising or average (79% of cases) with seed from community-based groups and government/FAO/NGO aid getting particularly high scores.

Focusing on those sowing less of a given crop, and an important 42% of total cases, the driving reasons for reduction were the same as in the Belg 2016, but in a slightly different order poor weather (26% cases), finances (23% cases), insufficient land/fields (16%) and then better sowing techniques. Lack of seed available was again barely cited as an issue (1.3 % cases).

Those answering 'No money to buy seed' will be key for calculating cash/voucher needs. The percent of the **total population surveyed** having this constraint for the Meher was 10%.

8. For crop cases of those 'sowing more than usual', reasons were generally the same as in the Belg, again with slightly different emphasis: better weather for a given crop (35%); more land access (15% of cases) and more seed available due to harvest (8%). Free seed aid was

noted as a boost in 6% of cases for those sowing more. So aid was a positive factor, but not the driving one for expanded crop use among the general population. Interestingly, changing crop profiles was also noted as an important the rational for increasing amounts of a given crop. This was generally due to changes towards more drought-resistant crops, e.g. moving to barley from maize, or changes to seize better market opportunities, such as moves toward chickpea.

Note: This need for farmers to have flexibility in what they sow, during stress periods is key. Farmers may alter crop and varieties used according to the immediate weather patterns, fields available, or prevailing market prices. Factoring in farmer choice and ability to strategize could improve the results of aid response.

In terms of the total population surveyed, free seed (aid) helped farmers increase sowing rates for, 1.1% of **farmers in the Meher 2016.**

On the supply side: seed/grain traders: Can the markets deliver?

Agro-dealer outlets and networks are just starting to be catalyzed in Ethiopia, with outlets located in very few towns (e.g. Adama) and mostly providing bags and packets of hybrid maize and vegetable seed solely. Hence, the market analysis focused on the local seed/grain markets, where farmers scout out grain that is suitable for planting material. For sowing material, farmers seek adapted varieties and look for grain of good quality (mature and not broken, with pebbles, dust and twigs sorted, and no pest damage.) This grain that can be sowed is referred to as 'potential seed'.

Local seed/grain markets were noted as particularly important for the legumes (common beans, chickpea, faba bean , lentil and field pea) and for the cereals (especially barley, teff and sorghum). In the Meher 2016 sample, local markets provided between 30-50% of the seed sown for each of the six crops cited above.

9. Seed/grain traders (N=103 observations) assessed Meher supplies as 'normal' or 'more abundant than normal' in 56 to 100% of cases per crop, with a focus on wheat, barley, teff, common beans, sorghum and maize.

10. Linked to #9, 'potential seed flows' from one region to another proved extensive and lacks in any one area, were assessed to be compensated by incoming supplies from another For instance, a trader in Korem/Tigray was directly commissioned by the government to source barley ('potential seed') from the surrounding areas of Kombolcha and Ch'erch'er and chickpea from as far off as Adama. . For the Meher 2016 alone, the four traders in question sold 200 MT (2000 qtl) to the Korem govt office. Specific adapted varieties were purchased with quality screening monitored by government staff during the transaction.

Any seed security district-level plans might practically project for such for inter-district flows, acknowledging that supply dips in one region can be compensated by inflows from another. Seed security plans should also recognize the key importance of 'potential seed' traders. Such traders need to be identified and supported in their quest to gather or produce quality seed. Activities might be targeted to this group to enable them to rapidly and efficiently move needed and

appropriate seed among areas. Again, they provide important amounts of seed and particularly of the legumes and minor cereals which are poorly represented in other commercial ventures like agrodealers etc. (only if you agree? ?)

11. Trader analysis of peak prices per quintal also showed relatively stability, comparing the current Meher 2016 with the Meher 2015 sale prices. Overall price rises were measured at +18%. Reviewing crop by crop, faba bean and wheat seed were actually cheaper between the Meher 2016 and Meher 2015 planting seasons (-2 and -3% respectively). The highest price hikes were noted for sorghum and teff potential seed (+ 27% and +23% respectively). Peak price changes did not seem formidable by trader assessments, but these figures be analyzed further according to longer-term trends.

All in all, seed/grain traders at each site saw potential seed supplies as available, with prices changes not unusually high, at least according to the trader point of view.

Can farmers afford to buy supplies available?

12. Expenses slated for seed purchase during the Meher 2016 were calculated for three of the major crops, with amounts of seed actually to be purchased (on average) and current prices figuring into final cash estimate. The amounts to be spent per household varied greatly by regions depending especially on land size and predominant crops. In the Dodota/Oromiya field example, a household might spend 2550 Birr total (for seed of teff, wheat and barley) during the Meher (translating to $US 116) . In contrast, in the Amhara field site, during the Meher, total figures seed costs of teff, wheat and field pea were monitored at 170 Birr (translating to $US 8). Total Meher seed costs for three crops for the other two sites were: 416 Birr for Tigray ($19) and 290 Birr ($US 13) for SNNPR.

These precise insights suggest that money spent on seed varies greatly by region/site and that any calculations for cash/voucher support would also need to be tailored. Of more general note is that farmers do buy seed and that costs could be a challenge for some. In addition, fertilizer has to be factored in to the tally of input costs.

Belg 2017

Projections for seed sourcing for the Belg 2017 were also obtained, crop by crop. As the upcoming season was four to six months away at the time of the assessment, such figures are but speculative. Major points for the Belg 2017 projections are:

Farmers expect to rely on informal channels for the bulk of their seed of two major crops. 71+% of the seed to be sown is projected to come from own stocks 58% and markets 12%.

Farmers project overall sowing rates to rise sharply: +28%. (showing an optimism).

Farmers have already factored in important government/FAO/NGO assistance for 24% of seed the next season, focused especially on maize, wheat and common bean and seeking free certified seed. For the other crops, they are counting on general self-sufficiency.

CHRONIC SEED SYSTEM CONCERNS AND EMERGING OPPORTUNITIES

The SSSA also examined some of the more systemic trends in the four Ethiopian regions tied to agricultural and seed security. Community-specific assessments were done in all four sites and included: community meetings, key informant interviews (with government leaders , business men, NGOs staff and others), and market analyses. The varied methods allowed for cross-verification and opened possibilities to assess medium-term trends. Several topics are highlighted below: dynamism, crop profiles and in use of seed sources, access to new varieties, use of non-seed inputs and seed aid history.

Crop diversification and (few) value added products

Communities provided overviews of major crops sown in their area, and rated their respective importance for food consumption, income, and possible transformation from raw agricultural products into value-added products geared to increasing revenue margins. Results are presented below for the community Zala in Tigray. Of note is that a large array of crops in the community—but virtually no transformation to add value to the product (except for local beers). Especially striking (but perhaps alarming) is the abundance of legumes—but mainly geared for sale. The community clearly recognizes their nutritional value but needs these crops more urgently to generate income (see Box 6).

Table 3.13: Tigray: Zala cmmunty- Divrsity of crops grown-- (but not eaten?)

Crop	Importance for food	Importance for income	Value added ?
Wheat	+++	++	
Teff	+++	++	
Barley	+++	+	local beers
Fava bean	+	+++	
Field pea	+	+++	
Lentil	+	+++	
Maize	+++	+	local beer
Finger Millet	+++	+	local beer
Vetch	+++	+	
Chickpea	+++	--	
Fenugreek	+	+++	

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

Box 6. Improving nutrition: is knowledge the biggest hurdle?

Globally, development initiatives and humanitarian interventions address the problems of malnutrition and under-nutrition by building knowledge of mothers and families on what the most nutrient dense food choices are. For families that depend on rainfed production, pulses can play an integral part of a healthy diet. Pulses like faba beans, chickpeas and field peas are a source of important vitamins and minerals and high levels of protein for a growing population. Knowledge alone though can not ensure that households consume these nutritious foods. Farmers in the community of Zala were very aware of the nutritional value of their faba, lentils and chickpeas but outlined the difficult economic choice they must make. Due to high market prices for pulses , they sell most of them at harvest (saving a small amount for children and elderly) and trade them in for a larger volume of a lower cost and less nutritious commodities.

Seed system sourcing-- dynamic trends

Community mapping of seed sources served to trace general trends in seed source strategy. Groups mapped seed sources for a particular crop and compared current sources with those used five years previous. The analysis shows that there has been some dynamism in sources—but mostly for just for big cereals like maize and wheat. In many cases, the seed source 'innovations are not sustainable—like NGOs giving new varieties one-off , or governments giving free aid.

Figure 3.8 maps seed sources in Dodota for wheat. There are multiple sources with all the newer ones subsidized. Note that during the stress period of 2016 Meher, farmers said they could NOT get seed from farmer cooperatives/unions (although this source was listed in the five years previous.)

Figure 3.9 maps the sources for field pea. As for most legumes, there are few sources for seed — only home stocks and local markets. Also, there has been no change in those sources for the five- year period.

Generally, in all sites, there was very little innovation in seed sourcing- and lots of subsidized seed (the ISSD group being an exception- seed *Decentralized Seed Multiplication below*). The big cereals (wheat, maize, teff) have been a strong focus on government extension efforts—with most legumes left by the wayside.

Figure 3.8. Dodota (Oromia) Seed sourcing patterns for Wheat: community assessment

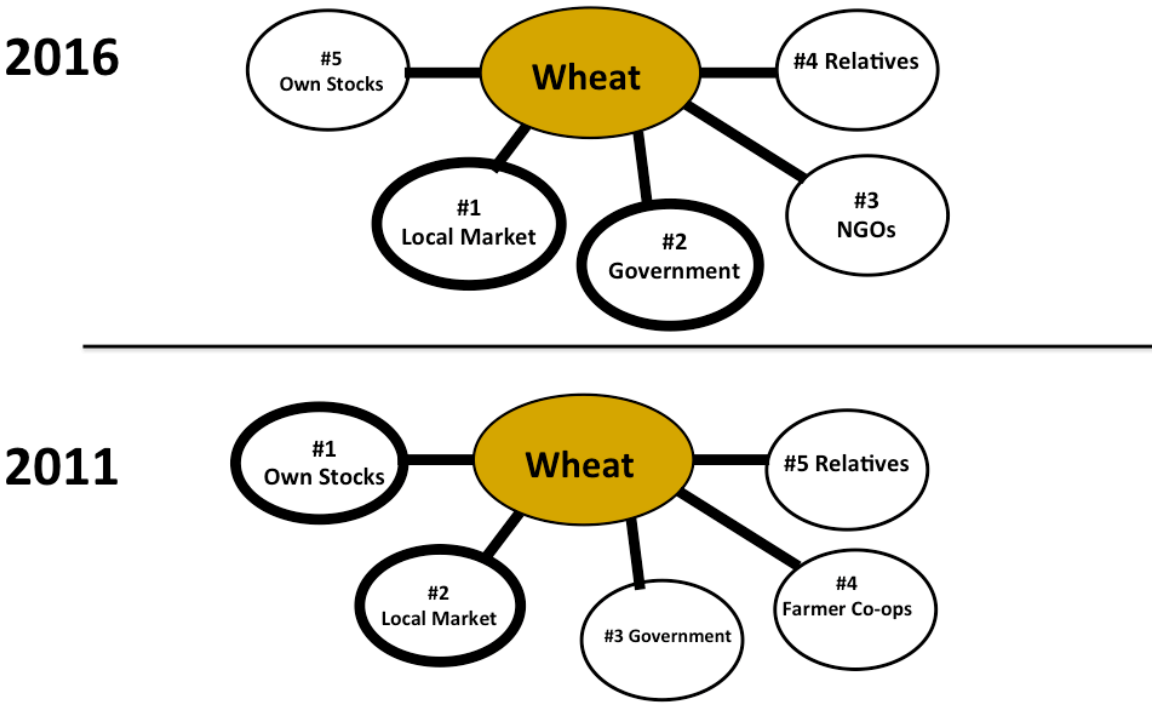
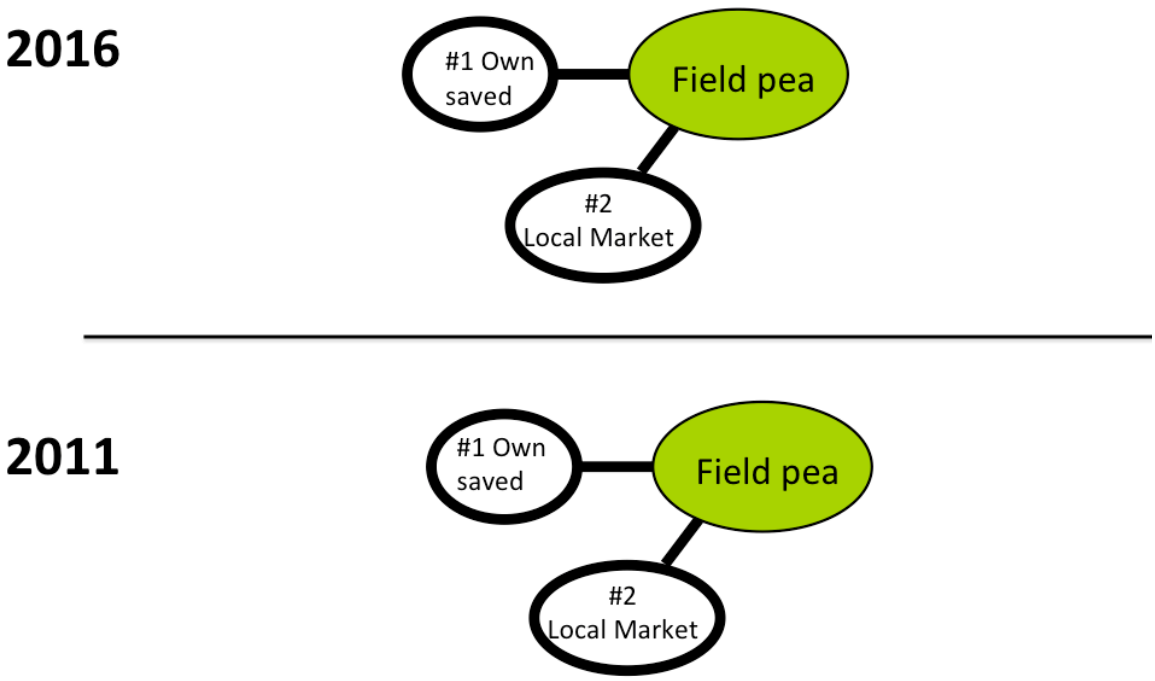


Figure 3.9. Dodota (Oromia) Seed sourcing patterns for Field Pea: community assessment



New varieties

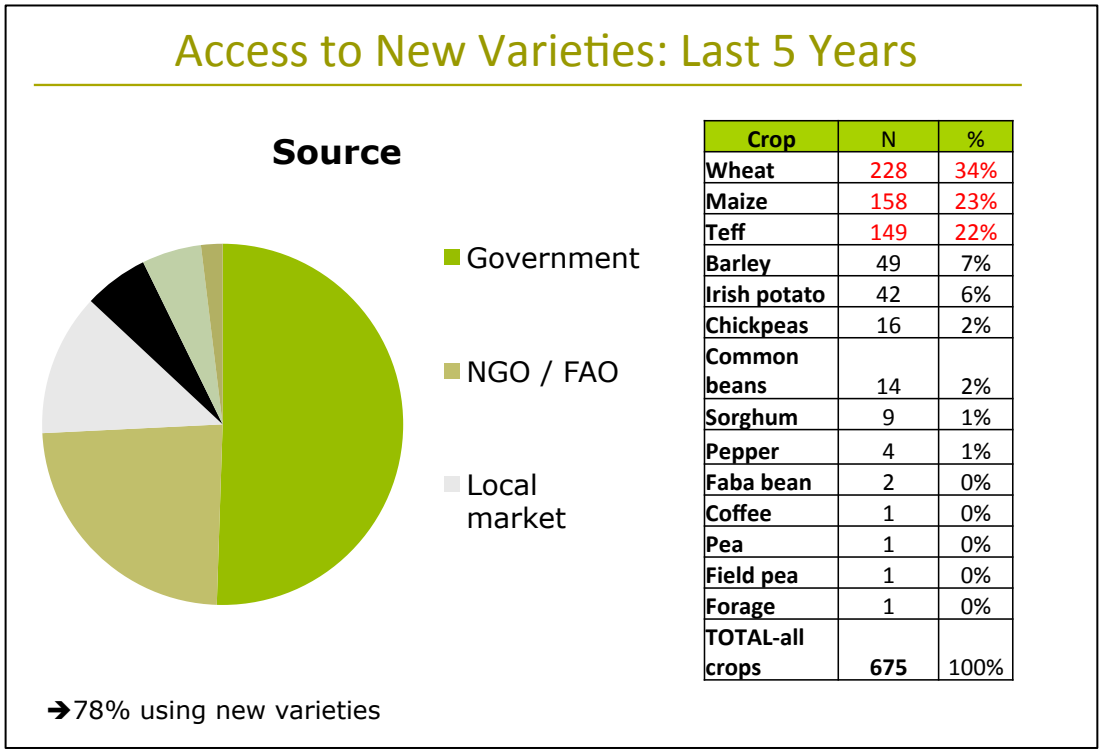
Within the context of assessing seed security, it is especially important to consider new variety access. Such varieties can be an economical way to increase production quickly. Figure 3.10 and Table 3.14 show the extent of variety introductions 'during the last five years' (approximately the period 2011-2016) within the site samples.

New variety access within the SSSA sample has been impressive. Within the 'last five years', 78% of households said they had gotten some access to a new variety. However 89% of these new accessions have been of maize, wheat and teff. There has been negligible access to new varieties of any of the legumes, which are key for nutrition.

New varieties were also overwhelmingly accessed via government or FAO/NGO channels (74% cases), rather than through commercial outlets that might serve farmers on a more continuing and sustainable basis.

Of some interest is farmers' re-selling of new varieties, certified seed and extension packages-. This process is an ad hoc way of getting quality seed and input products into the local markets. (Box 7).

Figure 3.10 and Table 3.14 Farmers' accessing new varieties in the 'last five years'



Crop	N	%
Wheat	228	34%
Maize	158	23%
Teff	149	22%
Barley	49	7%
Irish potato	42	6%
Chickpeas	16	2%
Common beans	14	2%
Sorghum	9	1%
Pepper	4	1%
Faba bean	2	0%
Coffee	1	0%
Pea	1	0%
Field pea	1	0%
Forage	1	0%
TOTAL-all crops	**675**	100%

Box 7. Reselling improved maize varieties and fertilizers (extension packages) at local markets

Ato Tesema is a young farmer who owns 0.5 hectares of land. He grows maize, chickpea, and cassava for household consumption. He has four children and his family depends on the food he produces from his small plot and the income he earns working as a daily laborer in Humbo and sometimes in Sodo town. He didn't receive an extension package with seeds and fertilizers from the *woreda* office of agriculture and elects not to do so. However, he has accessed an improved variety of maize and fertilizer from other farmers who received it through the extension service program. Ato Tesema says that improved seeds of maize and haricot bean are widely available in the market during the harvest periods from either, farmers who accepted the package and resell it, or from those who have small landholdings and who did not need all of the seeds they received. Also for Tesema, the standard extension maize packages are just too big--sold in larger packs 50kgs and 100 kgs and not convenient for smallholders like himself. He claims that lots smallholder farmers buy extension packages from the woreda agriculture office and then resell the extra in local markets.

The SSSA did identify a more systematic ways of getting vegetable seed into farmers' hands. Vegetable packets are often sold at agro-dealers but also a range of town shops.

Of particular interest in terms of rendering high quality seed more accessible, and even to the poor, is the use of small (or very small) pack sizes. As an example, agro-dealers in Adama were repacking seed from tins into very affordable units of 10g or less. There might be room for extending this small packet approach for a much larger array of crops, including the legumes such as haricot beans and field peas and chickpeas. The aim for farmers to be able to access new varieties, and to pay for them! (Box 8).

Box 8. Small seed packets – already working for urban farmers: extend this for all farmers!

Selling seed in smaller sized packets is a tried-and-tested approach to improve access to new varieties (Sperling and McGuire, 2010). Small packets, typically less than 1 kg, and as small as 100g, allow smallholder farmers to try out new varieties on their own farms at low risk – no more than the cost of a cup of tea. Small packets help uncover demand for new varieties and for certified seed quality, and have been promoted successfully in many countries. Some seed companies have used small packs to reach new clients effectively – e.g. Dryland Seeds (Sperling, 2015) and Leldet Seeds in Kenya (AGRA, 2010). However, Ethiopia's formal seed system largely produces seed to supply to other organizations such as Cooperatives or Bureaus of Agriculture, rather than to individual farmers: so Ethiopia is one of the few countries in the region where small packets are NOT available. But wait – for one group of farmers, small packets ARE being sold in Ethiopia. In agro-dealer boutiques such as this one in Adama, vegetable seed for carrots, beets, cauliflower, broccoli and kale is repackaged by AB Seeds into small packet sizes (10 g or less) for sale to urban gardeners. Note that the packaging information is in Amharic, which helps make these packets even more oriented to small-scale farmers. Clearly, if seed packaging is tailored to vulnerable groups, you can build a market. This successful model should be extended to field crops, and to rural outlets closer to where farmers live.

Decentralized Seed Multiplication

The SSSA clearly documented the need for novel ways of seed production and delivery-- --much closer to zones where farmers plant, and offering farmers the large array of crops and varieties they need—not just for production, but also to meet their resilience and nutrition needs. Farmers need choice so as to strategize. Much of the challenge in Ethiopia centers on the seed regulatory frameworks that dictate what can be sold as seed. The two boxes below document two rare efforts to create seed production groups that aim to delivery to farmers as their direct clients (as opposed to making money from institutional buyers, like NGOs). Both are supported by the Integrated Seed Sector Development Project (ISSD) The first group has obtained the needed 'Certificate of Competence' (CoC) to sell seed and currently focuses only on wheat and barley (Box 9). The second group, producing a highly preferred white teff variety, feels thwarted. Unless they get a CoC, they cannot get a fair price for their seed-focused efforts (Box 10).

The trade-offs between producing certified seed and getting out crops and varieties farmers want and need might be examined more closely. **Ethiopia has released 365 varieties in the last 10 years (Bright Management 2016a) and most of these are *not in farmers' hands*.**

Box 9. Seed Producer group with Certificate of Competence(CoC) still focusing on standard crops?

The Hiriti Mekan Seed Producer Cooperative is on some parameters an unusual success. Based near Mekelle, they produced 380 qtl of wheat and barley seed in 2015 and sold it all, both directly to farmers, through agents and to NGOs.

The coop has received some key support from Mekelle University (ISSD) and packs seed in 37.5 kg bags—which they consider 'small'—enough for covering a full ¼ ha. Buyers sometimes repack—to reach the poor and sell in 5 kg units or even less. (price is per kg).

They are making a rare profit, about USD $15,000 in three years, but to continue will need further financing for capital improvements.

Among the key future challenges are a) to expand the crop portfolio (next is chickpea ??) and b) to expand their rural client base which may mean formally reducing pack sizes and offering greater diversity (varieties and crops?).

Box 10. All (seed) dressed up, and nowhere to go! (seed production group)

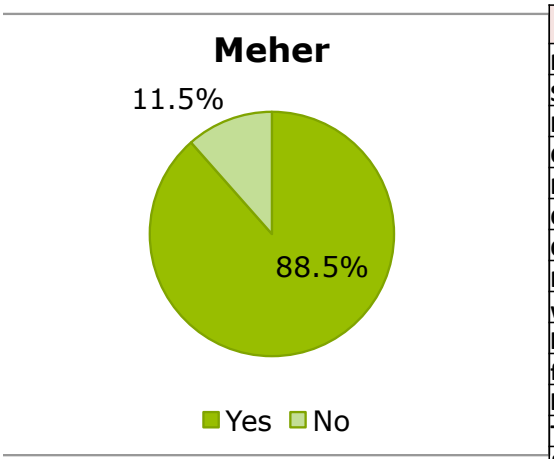
In Tehulederie woreda, the only seed production group is in Hitecha kebbele, set up in 2012/13 by Wollo University, at that time with ISSD support. The initial group of 40 farmers received Basic Seed for a white teff variety, *Quncho* released in 2006, which has proven popular (Assefa *et al.,* 2011), though was not widely known in Tehulederie. They received training and support in seed production of *Quncho*, which group members grow, manage, and store on individual farms. Seed production has been a success, and the variety has spread to neighbors through seed loans or exchanges between individuals. However, group members are frustrated as they see little added benefit to producing seed. They have had little support in marketing, or in organizing as a group, and have only sold 6 Quintals (600 kg) of seed in total. For this sale, the farmers sought 35 ETB / kg (the teff grain price is 25 ETB) to reward their extra efforts. However, the local government buyer refused, on the basis that it was not allowed to pay more than 15% above the grain price. Eventually the 6 Quintals were bought for 28 ETB / kg (12% above grain prices). In response to this, one member said "*If I cannot get any advantage from producing seeds, I don't really see the point of continuing in this group."* Indeed, the seed group membership has dropped to 30. Members seek support in obtaining a competency certificate (they have been inspected once by a Seed Laboratory in Dessie, but need at least two more inspections to get this), and would like to get more new varieties to diversify their activities. However, the project has not really been set up to develop sustainable enterprises, and support marketing to farmer clients. Without this type of support, seed multiplication groups like this one will remain supply-focused, and are unlikely to persist over time.

Mineral Fertilizer use

A large number of farmers in the sample also used inorganic (chemical fertilizers). Such fertilizer was employed 59% and 88% of farmers for the Belg 2016 and Meher 2016 respectively. Fertilizer is mostly applied on maize and teff (Belg) and wheat and teff (Meher) (Figure 3.11 and 3.15).

Especially for the Belg, farmers noted that it can be risky to use fertilizer as it 'burns the soil if there is a lack of rain'.

Figure 3.11 and 3.15: Farmers' use of fertilizer, Meher 2016

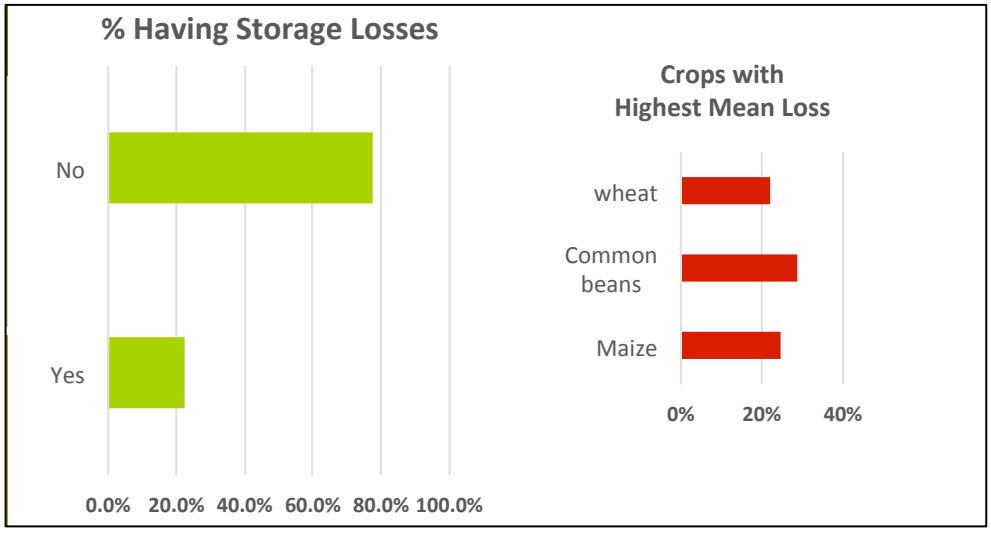


Crop	N	%
Maize	77	**10.6%**
Sorghum	39	5.4%
Irish potato	4	0.5%
Common beans	35	4.8%
Pigeonpea	1	0.1%
Chickpeas	2	0.3%
Onion	3	0.4%
Pepper/piment	5	0.7%
wheat	186	**25.5%**
barley	114	15.7%
faba bean	2	0.3%
lentil	1	0.1%
Teff	255	**35.0%**
field pea	2	0.3%
Forage	2	0.3%
TOTAL-all crops	**728**	**100.0%**

Storage Chemical Use – 2016 seasons

Storages chemical use and frequency of storage loss was also examined. Perhaps surprisingly, most farmers did not report significant storage losses 2015/16--- as their storage periods seem to be very short and/or little is being stored (and this is an issue that might be examined further). Crops with the highest losses (but < 30%) were reported to be wheat, haricot beans and maize.

Figure 3.12. Farmers' assessment of storage losses, 2015/2016

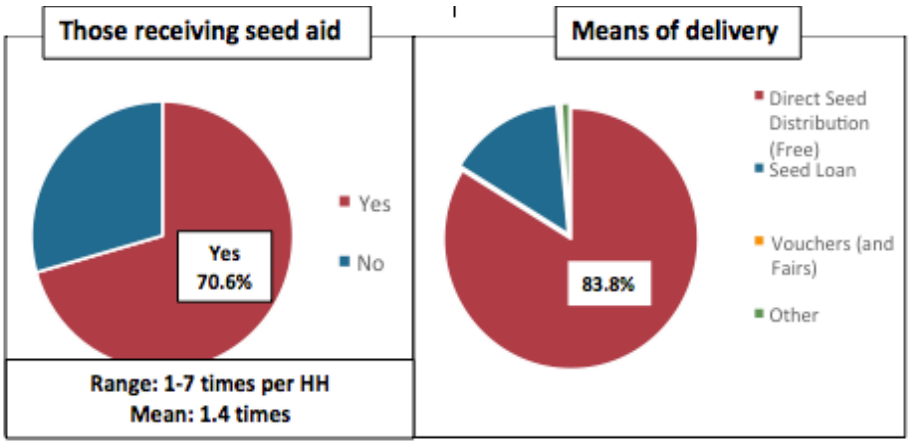


Seed Aid

As the last 'input' the SSSA focused on seed aid, which has been an important form of assistance in Ethiopia (for over 40 years, starting in 1974, http://seedsystem.org/wp-content/uploads/2014/03/long_term_seed_aid_Eth07_full.pdf) .

The SSSA results show that about 70% of the total population has received seed aid between 2011 and 2016 with some having received it 7 times. The means of delivery has largely been through direct seed distribution (DSD). (Note that the SSSA was effected generally in aid-receiving areas.

Figures 3.13 and 3.14. Seed aid: 2011-2016



Section on ***New Varieties*** documented the degree to aid is the most common way by which farmers get new varieties in Ethiopia (and they are not given choice of which crops or varieties are key for them to sow). The figures combine development and emergency aid as farmers themselves cannot always accurately distinguish the two.

The SSSA during the Belg and Meher 2016 documented particularly aid given in an emergency context and highlighted several practical concerns of the way that 'development aid' is being conflated with 'emergency aid'.

> Farmers receiving new varieties through one-off seed aid do not necessarily get the back-up technical support to use that aid effectively. Especially in SNNPR, there were multiple cases of those receiving hybrid maize resowing it (not understanding that it need to be renewed). Not surprisingly, numerous farmers recounted a swift decline in 'Panar' (likely a Pioneer variety).
>
> Farmer recipients of aid went well beyond those 'most vulnerable' and 'identified by the community'. It included many examples of the better off and those who sought access to new varieties and certified seed. Such certified seed, and new varieties, is hard to access in routine development channels so diverse farmers might seek to be included in the emergency beneficiary group.
>
> Select farmers simply refused seed aid. They refused especially maize due to the common concomitant obligation, or practical pressure, for obligatory fertilizer use and sowing in lines. Fertilizer use comes with a high price and additional economic risk for the family in the event of poor crop performance.

Surely, there must be better ways of getting (and selling) novel crop and varieties to millions of Ethiopian farmers—than just giving blind products free.

Summary: Chronic Seed Security Findings and Emerging Opportunities

1. Crop diversification within communities does not necessarily mean that the range of goods (including the nutritious legumes) are being managed for household consumption. Legume sale for cash (rather than consumption) is a trend to be remarked. Also, there was little agro-processing in the communities sampled, resulting in little value addition on site.

2. Seed sourcing strategies were relatively unchanged over a five year period for a range of crops. Changes in key crops such as wheat and maize were frequently linked to higher subsidy (i.e. forms of aid). Farmer Unions and Cooperatives proved important as a seed security source for a narrow range of crops.

3. Inorganic (chemical) fertilizer was employed by 59% and 88% of farmers for the Belg 2016 and Meher 2016 respectively. Especially for the Belg, farmers noted that it can be risky to use fertilizer as it 'burns the soil if there is a lack of rain'. Fertilizer is mostly applied on maize and teff (Belg) and wheat and teff (Meher) .

4. Most farmers did not report storage losses 2015/16--- as their storage periods seem to be very short and/or little is being stored (and this is an issue that might be examined further). Crops with the highest losses (but < 30%) were reported to be wheat, haricot beans and maize.

5. New variety access within the SSSA sample has been impressive. Within the 'last five years', 78% of households said they had gotten some access to a new variety. However 89% of these new accessions have been of maize, wheat and teff. There has been negligible access to new varieties of any of the legumes, which are key for nutrition.

6. New varieties were also overwhelmingly accessed via government or FAO/NGO channels (74% of cases), rather than through commercial outlets that might serve farmers on a more continuing and sustainable basis.

7. New varieties have also been accessed mainly through emergency aid. This conflating of development with emergency aid is resulting in several concerns raised in the Belg 2016 and Meher 2016 season.

    - Farmers receiving new varieties through one-off seed aid do not necessarily get the back-up technical support to use that aid effectively. There were multiple cases of those receiving hybrid maize (whose seed should not be resowed). There were multiple cases of farmers recounting a swift decline in 'Panar' (likely a Pioneer variety).

- Farmer recipients of aid went well beyond those 'most vulnerable' and 'identified by the community'. It included many examples of the better off and those who sought access to new varieties and certified seed. Such certified seed, and new varieties, is hard to access in routine development channels so diverse farmers might seek to be included in the beneficiary group.
- Select farmers refused seed aid. They refused especially maize due to the common concomitant obligation, or practical pressure, for obligatory fertilizer use and sowing in lines. Fertilizer use comes with a high price and additional economic risk for the family in the event of poor crop performance.

8. Seed aid, that is free distribution of seed as part of emergency response and development initiatives, has been conducted on a large scale, with 70% of the sample having received such aid within the last five years. Aid was received in the general population on average 1.7 times within the last five years, with a high of 7 times. Most of the aid cases were implemented by direct seed distribution (84%), with a few citing seed loans (15% of cases).

   Aid methods which allow farmers choice and the ability to strategize, such as cash, vouchers or seed fairs were virtually non-existent for the full sample.

9. The decentralized seed multiplication units examined were limited, and focused on major crops. The need for a full-fledged Certificate of Competence (CoC) may be hampering farmers' access to the range of crops and varieties they need for production, and bolstering resilience and nutrition. Ethiopia has released 365 varieties in the last 10 years and most of these are *not in farmers' hands. Outlets for seed sale are relatively few and pack sizes still generally 'large (at 50 to 100 kg, with an occasional 20 kg or 12.5 kg unit).*

IV. OVERALL RECOMMENDATIONS: ACROSS SITES

RECOMMENDATIONS : For The Short-Term

Below find key recommendations that are applicable across all sites. They emerge from an analysis of the field evidence and focus on recommendations in the short-term.

3. **Direct seed aid (distribution) for 2017 should be limited**. There is little evidence of seed unavailability in home stocks and markets, and farmers do not cite seed unavailability as a reason for planting less.

    1.3 To minimize risk. any direct seed distribution might focus on crops and varieties already known and used by farmers in a given region;

    1.4 Direct seed distribution in emergency might best avoid technologies that tie poor farmers into repeated obligations of re-purchase (such as hybrid maize).

4. **Vulnerable farmers should be given means to access seed in Belg 2017 (cash, vouchers, possibly through fairs)**. The major seed-related reason for farmers' planting less had to do with money. This was true for all sites and both Belg and Meher seasons.

    a. The amount of any cash/voucher transfer might best to tailored by region as seed costs vary dramatically according to land size and crop profile.

    2.2 As vouchers/cash/fairs also aim to allow farmers to strategize during stress, specific efforts should be made to ensure a wide range of crops are on offer. (also legumes and minor cereals)

3. Vulnerable farmers might also be given means to access /alleviate other constraints Belg 2017. Vouchers for oxen might be explored specifically in SNNPR. Some analysis of vouchers for field rental might also be considered.

5. Support for local markets in this emergency/stress should be considered. Local markets provided 30 to 50% of the seed sown for all legumes and key minor cereals. Select Seed/grain traders are also already serving to provide emergency seed stocks in key regions.

- Seed security traders might be usefully identified in each region;
- Seed security traders might receive support to ensuring a quality product;
    - Training on seed sourcing and selection
    - Possible credit for better storage.

All in all, acute support should address the evidence-based constraints identified.

RECOMMENDATIONS : For The Medium-Term

There is need for more broad-based thinking on how to improve the seed security of smallholder farmers in Ethiopia. Government aid (and repeated aid) is currently the driving production and delivery mechanism for smallholders . As modest areas for wider action, suggestions below are :

5. **Decentralized seed production** needs to become a more strategic and effective force in serving farmers as the formal seed sector will never be able to handle a) the range of crops needed for stress zones; nor b) the range of varieties. At this point, the decentralized seed multiplication initiatives seem to be having modest gains. Those visited had limited crop portfolios and their expansion was hampered by the full-fledged requirement of Certificate of Competency (CoC). As a general recommendation, sustainable decentralized seed production models need to be confirmed many regions of Ethiopia (with ISSD efforts being an important stating point). Decentralized seed production and delivery ill prove particularly important for the legumes and for the vegetatively-propagated crops, especially in SNNPR.

6. **Delivery mechanisms for giving all farmers regular access to new varieties** need to be intensified. Sale through agro-dealers provides only one venue and mainly only for maize and vegetable seed. Farmer Coops and Unions handle a narrow set of crops/varieties. Sale of diverse seed in broader range of outlets, such a regular country stores or open markets might give farmers more access. Sale in smaller pack sizes (1 kg, 2kg 5 kg) may also open up opportunities for poorer farmers to access new varieties and quality seed.

7. **Given that local markets (and their traders) are important for farmers' seed supply, more attention should be given to encouraging that these open seed/grain markets supply the kinds of potential seed farmers want and need on a more consistent basis**— and not just in emergency As one point of departure, seed/grain traders could be powerful partners in helping to move *new modern varieties* widely, within and among farming communities.

8. **Finally, the focus on quality seed for increased production might usefully be broadened to include the goals of 'enhanced resilience' and 'enhanced nutrition'.** A prime focus on cereals alone (the current *de facto* strategy) may not be sufficient to help strengthen farming systems in these times of repeated climate stress and food insecurity.

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PREPARATORY PAPERS COMMISSIONED FOR SSSA in Ethiopia

a. **Overview of Plant Breeding and Variety Release**

b. **Overview of Formal Seed Sector Operations**

c. **Inventory of Existing Seed Production Operations and Existing Major Suppliers**

ANNEX I: ASSESSMENT SITES

A. Oromiya

Region	Zone	Woreda	Agroecology	Dominant Crop Belg	Dominant Crop Meher	SSSA Catchment Host	Base	Assessment Site	Rationale for Inclusion
Oromiya (Rift Valley)	Arsi	Dodota	Lowland	n/a	wheat, teff	MCS	Adama	Site #1 - Sept 29 - Oct 4	Logistically easy with access off the highway. Large agricultral area with good representation despite only having meher season.
Oromiya (Rift Valley)	Arsi	Sire	Intermediate altitude	n/a	wheat, teff	MCS	Adama	Site #1 - Sept 29 - Oct 4	Logistically easy with access off the highway. Large agricultral area with good representation despite only having meher season.

B. SNNPR

Reg.	Zone	Woreda	Agro-ecology	Dominant Crop Belg	Dominant Crop Meher	SSSA Host	Base	Assessment Site	Rationale for Inclusion
SNNP	Kembata-Tembaro	Hadero Tunto	Intermediate altitude	maize, haricot bean	wheat, teff, haricot bean	Hossana	Soddo	Site #3 - October 6 - 10	2 cropping seasons, logistically easy - 35 km from Soddo
SNNP	Wolaita	Humbo	Lowland	maize, haricot bean	teff, chickpea, haricot bean	Soddo	Soddo	Site #3 - October 6 - 10	2 cropping seasons, near Soddo (17 Km)

C. TIGRAY

Region	Zone	Woreda	Agro ecology	Dominant Crop		Other Characteristics	Host	Base	Rationale for Inclusion
				Belg	Meher				
Tigray	Southern	R/Alamata	Lowland	Wheat, teff	Wheat, teff, maize, sorghum		REST	Alamata	2 seasons, logistically convenient
Tigray	Southern	Ofla	Highland	Wheat, barley	Wheat, barley, field pea, faba bean	Belg rain failed	REST	Alamata	Highland AE, crop diversity

D. Amhara

Reg.	Zone	Woreda	Agro-ecology	Dominant Crop Belg	Dominant Crop Meher	SSSA Host	Base	Assessment Site	Rationale for Inclusion
Amhara	South Wollo	Dessie-Zuria	Highland	wheat, barley	barley, wheat	ORDA	Dessie	Site #6 - October 6 - 10	2 seasons, logistically convenient - close to Dessie
Amhara	North Wollo	Theluhederie	Intermediate altitude	wheat, teff	wheat, teff, chickpea, sorghum, maize	ORDA	Dessie	Site #6 - October 6 - 10	2 seasons, ORDA sub-office, crop diversity, close to Dessie

ANNEX II: Site by Site Key Data Tables

1.1 SNNPR - Meher 2016 – Seed Sources (% of Total)

Crop	Total kg sowed	% of total										
		Home saved /own stock	Carryover - maize hybrids	friends, neighbours , relatives	local market	agro-input dealer	community-based seed groups	govern-ment	NGO / FAO	contract seed growers	Other	TOTAL %
Maize	371.9	19.6	0.6	0.0	0.0	0.0	0.0	**74.8**	5.0	0.0	0.0	**100.0**
Sorghum	2.0	0.0	0.0	**100.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Sweet potato	8.4	4.8	0.0	**95.2**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Irish potato	0.0											0.0
Common beans	404.6	12.1	0.0	0.0	**34.1**	0.0	0.0	25.7	28.2	0.0	0.0	100.0
Chickpeas	279.2	2.5	0.0	0.4	**50.6**	0.0	0.0	24.7	21.8	0.0	0.0	100.0
Tomato	1.4	0.0	0.0	0.0	**100.0**	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Onion	6.6	0.0	0.0	0.0	**57.6**	0.0	0.0	12.1	0.0	0.0	**30.3**	100.0
Pepper/piment	43.4	**87.6**	0.0	1.8	11.1	0.0	0.0	0.0	0.0	0.0	0.0	100.5
Taro	1.6	**92.3**	0.0	0.0	7.7	0.0	0.0	0.0	0.0	0.0	0.0	100.0
wheat	0.0											0.0
barley	0.0											0.0
faba bean	0.0											0.0
lentil	0.0											0.0
Teff	1162.5	9.7	0.0	0.3	**56.5**	0.0	0.0	24.3	9.2	0.0	0.0	100.0
field pea	0.0											0.0
TOTAL-all crops	2281.5	12.3	0.1	0.7	**41.5**	0.0	0.0	**32.2**	13.2	0.0	0.1	100.0

1.2 SNNPR - Meher 2016 – More, Same or Less than Usual (%)

Crop	Number of HHs	% of HHs			Change sowing quantites for all growing the crop
		MORE	SAME	LESS	average % change
Maize	16	0.0	31.3	68.8	***-28.66***
Sorghum	1	100.0	0.0	0.0	0.00
Sweet potato	2	0.0	0.0	100.0	0.00
Common beans	60	15.0	28.3	56.7	***-2.99***
Chickpeas	34	11.8	17.6	70.6	***-26.11***
Tomato	1	100.0	0.0	0.0	0.00
Onion	7	14.3	57.1	28.6	***-12.38***
Pepper/piment	13	30.8	46.2	23.1	**9.96**
Taro	3	0.0	66.7	33.3	0.00
Teff	95	11.6	23.2	65.3	***-22.90***
TOTAL-all crops	**232**	**14.2**	**26.7**	**61.2**	***-15.85***

1.3 SNNPR - Meher 2016 – Reasons for Sowing Less

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
No seed available in market/trader/agro-phramacy	1	0.7%
No seed/cuttings available from neighbors	0	0.0%
Seed access		
No money to buy seed/poor finances or seed too high	26	18.3%
Seed quality		
Seed available is not good quality or the variety is not liked	2	1.4%
Sub-total: seed-related	**29**	**20.4%**
NON-SEED FACTORS OF PRODUCTION (limits)		
No/insufficient labor	2	1.4%
Illness/health problems	7	4.9%
No/insufficient land or land not appropriate/sufficiently fertile	19	13.4%
Lack of tools/tractor/ other machinery to farm	9	6.3%
Plant pests/diseases make production not possible	0	0.0%
Animals/predator make production not possible	0	0.0%
Lack of other inputs: controlled water supply/irrigation or fertilizer	1	0.7%
Low quality of inputs: eg. Fertilizer, herbicides, pesticides	0	0.0%
Price of inputs is too high	1	0.7%
Poor weather/rainfall	48	**33.8%**
Insecurity (e.g. theft)	0	0.0%
Sub-total: Factors of Production	**87**	**61.3%**
OTHER PRIORITIES/STRATEGIES		
Markets for crop or crop products not well-developed	0	0.0%
Other priorities than agriculture (e.g. have shop). Changing CROP priorities	0	0.0%
Other	20	14.1%
TOTAL	**142**	**95.8%**

1.4 SNNPR - Meher 2016 – Reasons for Sowing More

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
More seed available due to good harvest	8	24.2%
More seed available due to free seed	2	6.1%
Seed access		
More money to buy seed or seed price low	0	0.0%
Got credit to buy seed	0	0.0%
Vouchers (or NGO-provided cash)	0	0.0%
Seed quality		
Have especially good seed or good variety	5	15.2%
Sub-total: seed-related	**15**	**45.5%**
NON-SEED FACTORS OF PRODUCTION (opportunities)		
Good/increased labor	0	0.0%
Feeling strong/healthy	0	0.0%
Have more land/more fertile land	3	9.1%
Have tools/tractor, other machinery to help farm	0	0.0%
Have access to irrigation, fertilizer or other inputs (for example, stakes)	0	0.0%
Good weather/rainfall	0	0.0%
Good security (peace has arrived; less theft)	0	0.0%
Sub-total: Factors of Production	**3**	**9.1%**
OTHER PRIORITIES/STRATEGIES		
Well-developed /new markets for crop or crop products	2	6.1%
Have decided to give more priority to agriculture/ Changed CROP priorities	6	18.2%
Other	6	18.2%
TOTAL	**33**	**97.0%**

1.5 SNNPR - Belg 2016 – Seed Sources (% of Total)

Crop	Total kg sowed	% of total										
		Home saved /own stock	Carryover - maize hybrids	friends, neighbours, relatives	local market	agro-input dealer	community-based seed groups	govern-ment	NGO / FAO	contract seed growers	Other	TOTAL %
Maize	1975.6	23.0		0.6	9.0			54.2	13.4			100.2
Common beans	474.3	23.0	3.4		26.4			20.4	26.8			100.0
Pigeonpea	48.8	45.1			54.9							100.0
Chickpeas	34.3	100.0										100.0
Onion	1.5	66.7			33.3							100.0
Pepper/piment	26.0	46.5		45.8	8.5							100.8
Taro	13.0	59.7		5.8	33.5							99.0
TOTAL-all crops	2573.5	24.9	0.6	1.0	13.1	0.0	0.0	45.4	15.2	0.0	0.0	100.2

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1.6 SNNPR - Belg 2016 – More, Same or Less than Usual (%)

Crop	Number of HHs	% of HHs			Change sowing quantites for all growing the crop
		MORE	SAME	LESS	average % change
Maize	126	7.1	38.1	54.0	***-12.18***
Common beans	58	5.2	36.2	58.6	***-19.70***
Pigeonpea	13	7.7	30.8	61.5	***-26.41***
Chickpeas	4	0.0	75.0	25.0	
Onion	2	0.0	0.0	100.0	
Pepper/piment	19	15.8	36.8	42.1	***-15.74***
Taro	20	20.0	40.0	40.0	***-6.58***
TOTAL-all crops	**242**	**9.1**	**37.6**	**54.1**	***-14.34***

1.7 SNNPR - Belg 2016 – Reasons for Sowing Less

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
No seed available in market/trader/agro-phramacy	1	0.8%
No seed/cuttings available from neighbors	0	0.0%
Seed access		
No money to buy seed/poor finances or seed too high	29	**22.1%**
Seed quality		
Seed available is not good quality or the variety is not liked	2	1.5%
Sub-total: seed-related	**32**	**24.4%**
NON-SEED FACTORS OF PRODUCTION (limits)		
No/insufficient labor	6	4.6%
Illness/health problems	4	3.1%
No/insufficient land or land not appropriate/sufficiently fertile	24	18.3%
Lack of tools/tractor/ other machinery to farm/oxen	12	9.2%
Plant pests/diseases make production not possible	0	0.0%
Animals/predator make production not possible	0	0.0%
Lack of other inputs: controlled water supply/irrigation or fertilizer	1	0.8%
Low quality of inputs: eg. Fertilizer, herbicides, pesticides	0	0.0%
Price of inputs is too high	0	
Poor weather/rainfall	37	**28.2%**
Insecurity (e.g. theft)	0	0.0%
Sub-total: Factors of Production	**84**	**64.1%**
OTHER PRIORITIES/STRATEGIES		
Markets for crop or crop products not well-developed	0	0.0%
Other priorities than agriculture (e.g. have shop).		
Other CROP priorities	3	2.3%
Other	12	9.2%
TOTAL	**131**	**100.0%**

1.8 SNNPR - Belg 2016 – Reasons for Sowing More

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
More seed available due to good harvest	7	31.8%
More seed available due to free seed	4	18.2%
Seed access		
More money to buy seed or seed price low	0	0.0%
Got credit to buy seed	0	0.0%
Vouchers (or NGO-provided cash)	0	0.0%
Seed quality		
Have especially good seed or good variety	0	0.0%
Sub-total: seed-related	**11**	**50.0%**
NON-SEED FACTORS OF PRODUCTION (opportunities)		
Good/increased labor	0	0.0%
Feeling strong/healthy	1	4.5%
Have more land/more fertile land	4	18.2%
Have tools/tractor, other machinery to help farm	0	0.0%
Have access to irrigation, fertilizer or other inputs (for example, stakes)	1	4.5%
Good weather/rainfall	0	0.0%
Good security (peace has arrived; less theft)	0	0.0%
Sub-total: Factors of Production	**6**	**27.3%**
OTHER PRIORITIES/STRATEGIES		
Well-developed /new markets for crop or crop products	0	0.0%
Have decided to give more priority to agriculture / changed crop priorities	1	4.5%
Other	2	9.1%
TOTAL	**22**	**90.9%**

1.9 SNNPR - Belg 2017 – Seed Sources (% of Total)

Crop	Total kg sowed	% of total										
		Home saved /own stock	Carryover - maize hybrids	friends, neighbours, relatives	local market	agro-input dealer	community-based seed groups	government	NGO / FAO	contract seed growers	Other	TOTAL %
Maize	2661.9	16.4	0.0	0.0	4.5	0.0	0.0	76.0	1.5	0.0	0.0	98.5
Sorghum	10.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0
Common beans	664.9	21.1	0.2	0.0	36.8	0.0	0.0	39.4	2.5	0.0	0.0	100.0
Pigeonpea	138.5	62.5	0.0	0.0	19.5	0.0	0.0	18.1	0.0	0.0	0.0	100.0
Onion	14.4	13.9	0.0	0.0	72.2	13.9	0.0	0.0	0.0	0.0	0.0	100.0
Pepper/piment	33.3	69.8	0.0	1.8	22.4	0.0	0.0	0.0	0.0	0.0	0.0	94.0
Taro	16.8	75.9	0.0	0.0	24.1	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Teff	54.0	3.7	0.0	0.0	50.0	0.0	0.0	46.3	0.0	0.0	0.0	100.0
TOTAL-all crops	3593.7	19.6	0.0	0.0	12.3	0.1	0.0	65.3	1.6	0.0	0.0	98.8

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1.10 SNNPR - Belg 2017 – More, Same or Less than Usual (%)

Crop	Number of HHs	% of HHs			Change sowing quantites for all growing the crop
		MORE	SAME	LESS	average % change
Maize	129	45.0	41.9	13.2	**37.55**
Sorghum	1	0.0	100.0	0.0	
Common beans	61	54.1	32.8	13.1	**73.87**
Pigeonpea	15	46.7	53.3	0.0	**73.33**
Onion	7	57.1	42.9	0.0	**50.00**
Pepper/piment	16	50.0	37.5	12.5	**42.99**
Taro	22	31.8	54.5	13.6	**5.32**
Teff	3	33.3	66.7	0.0	
TOTAL-all crops	**254**	**47.6**	**42.5**	**12.6**	**48.73**

2.1 OROMIA - Meher 2016 – Seed Sources (% of Total)

Crop	Total kg sowed	% of total										
		Home saved /own stock	Carryover - maize hybrids	friends, neighbours, relatives	local market	agro-input dealer	community-based seed groups	govern-ment	NGO / FAO	contract seed growers	Other	TOTAL %
Maize	302.2	24.8	0.0	0.0	22.9	0.0	8.3	25.1	18.9	0.0	0.0	**100.0**
Sorghum	20.0	0.0	0.0	**40.0**	0.0	0.0	0.0	**60.0**	0.0	0.0	0.0	100.0
Common beans	75.0	0.0	0.0	0.0	**100.0**	0.0	0.0	0.0	0.0	0.0	0.0	100.0
wheat	19287.0	**35.5**	0.0	6.8	20.3	9.3	1.3	9.0	16.7	0.0	0.0	98.9
barley	4502.0	**41.3**	0.0	0.0	**59.1**	0.0	0.0	0.0	0.0	0.0	0.0	100.4
Teff	5910.0	**35.3**	0.0	8.3	**45.5**	0.0	1.4	5.5	3.7	0.0	0.2	100.0
TOTAL-all crops	30096.2	**36.1**	0.0	6.0	**31.3**	6.0	1.2	7.2	11.6	0.0	0.0	99.4

2.2 OROMIA - Meher 2016 – More, Same or Less than Usual (%)

Crop	Number of HHs	% of HHs			Change sowing quantites for all growing the crop
		MORE	SAME	LESS	average % change
Maize	15	13.3	46.7	40.0	**9.86**
Sorghum	1	0.0	0.0	100.0	0.00
Common beans	3	33.3	33.3	33.3	0.00
wheat	93	10.8	32.3	57.0	*-16.53*
barley	24	4.2	29.2	66.7	*-26.92*
Teff	81	27.2	30.9	42.0	**13.11**
TOTAL-all crops	**217**	**16.6**	**32.3**	**51.2**	*-4.88*

2.3 OROMIA - Meher 2016 – Reasons for Sowing Less

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
No seed available in market/trader/agro-phramacy	0	0.0%
No seed/cuttings available from neighbors	0	0.0%
Seed access		
No money to buy seed/poor finances or seed too high	53	**47.7%**
Seed quality		
Seed available is not good quality or the variety is not liked	2	1.8%
Sub-total: seed-related	**55**	**49.5%**
NON-SEED FACTORS OF PRODUCTION (limits)		
No/insufficient labor	10	9.0%
Illness/health problems	2	1.8%
No/insufficient land or land not appropriate/sufficiently fertile	12	10.8%
Lack of tools/tractor/ other machinery to farm	1	0.9%
Plant pests/diseases make production not possible	0	0.0%
Animals/predator make production not possible	0	0.0%
Lack of other inputs: controlled water supply/irrigation or fertilizer	0	0.0%
Low quality of inputs: eg. Fertilizer, herbicides, pesticides	0	0.0%
Price of inputs is too high	1	0.9%
Poor weather/rainfall	21	18.9%
Insecurity (e.g. theft)	0	0.0%
Sub-total: Factors of Production	**47**	**42.3%**
OTHER PRIORITIES/STRATEGIES		
Markets for crop or crop products not well-developed	1	0.9%
Other priorities than agriculture (e.g. have shop). Changing CROP priorities	2	1.8%
Other	6	5.4%
TOTAL	**111**	**100.0%**

2.4 OROMIA - Meher 2016 – Reasons for Sowing More

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
More seed available due to good harvest	1	2.8%
More seed available due to free seed	4	11.1%
Seed access		
More money to buy seed or seed price low	1	2.8%
Got credit to buy seed	0	0.0%
Vouchers (or NGO-provided cash)	1	2.8%
Seed quality		
Have especially good seed or good variety	1	2.8%
Sub-total: seed-related	**8**	**22.2%**
NON-SEED FACTORS OF PRODUCTION (opportunities)		
Good/increased labor	1	2.8%
Feeling strong/healthy	0	0.0%
Have more land/more fertile land	7	19.4%
Have tools/tractor, other machinery to help farm	0	0.0%
Have access to irrigation, fertilizer or other inputs (for example, stakes)	1	2.8%
Good weather/rainfall	7	19.4%
Good security (peace has arrived; less theft)	0	0.0%
Sub-total: Factors of Production	**16**	**44.4%**
OTHER PRIORITIES/STRATEGIES		
Well-developed /new markets for crop or crop products	3	8.3%
Have decided to give more priority to agriculture/ Changed CROP priorities	6	16.7%
Other	3	8.3%
TOTAL	**36**	**100.0%**

3.1 AMHARA - Meher 2016 – Seed Sources (% of Total)

Crop	Total kg sowed	% of total										
		Home saved /own stock	Carryover - maize hybrids	friends, neighbours , relatives	local market	agro-input dealer	community-based seed groups	govern-ment	NGO / FAO	contract seed growers	Other	TOTAL %
Maize	80.9	**38.3**	0.0	12.5	15.5	0.0	9.9	0.0	23.8	0.0	0.0	**100.0**
Sorghum	15.8	**100.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Irish potato	740.0	**74.3**	0.0	0.0	5.4	0.0	0.0	10.1	10.1	0.0	0.0	100.0
Common beans	26.5	**37.7**	0.0	**47.2**	15.1	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Chickpeas	25.8	**34.0**	0.0	0.0	0.0	0.0	0.0	**38.8**	27.2	0.0	0.0	100.0
wheat	578.6	**58.2**	0.0	16.6	6.4	0.0	4.6	0.0	14.3	0.0	0.0	100.0
barley	2604.0	**83.4**	0.0	1.2	6.8	0.0	2.5	9.6	0.0	0.0	0.0	103.5
faba bean	303.5	**60.5**	0.0	6.6	**32.9**	0.0	0.0	0.0	0.0	0.0	0.0	100.0
lentil	254.5	**85.1**	0.0	0.0	14.9	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Teff	349.7	**65.1**	0.0	4.7	5.8	0.0	4.7	8.4	11.3	0.0	0.0	100.0
field pea	434.5	**62.5**	0.0	0.0	**37.5**	0.0	0.0	0.0	0.0	0.0	0.0	100.0
TOTAL-all crops	5413.7	**74.3**	0.0	3.4	10.9	0.0	2.1	6.7	4.1	0.0	0.0	101.7

3.2 AMHARA - Meher 2016 – More, Same or Less than Usual (%)

Crop	Number of HHs	% of HHs			Change sowing quantites for all growing the crop
		MORE	SAME	LESS	average % change
Maize	17	5.9	64.7	29.4	*-8.72*
Sorghum	2	0.0	100.0	0.0	0.00
Irish potato	7	28.6	28.6	42.9	**32.38**
Common beans	3	33.3	33.3	33.3	0.00
Chickpeas	3	33.3	66.7	0.0	0.00
wheat	26	0.0	57.7	42.3	*-15.71*
barley	47	2.1	55.3	42.6	*-18.67*
faba bean	15	6.7	40.0	53.3	*-22.68*
lentil	9	22.2	22.2	55.6	**0.90**
Teff	55	7.3	58.2	34.5	*-5.47*
field pea	19	10.5	47.4	42.1	**25.70**
TOTAL-all crops	**203**	**7.4**	**53.2**	**39.4**	*-6.09*

3.3 AMHARA - Meher 2016 – Reasons for Sowing Less

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
No seed available in market/trader/agro-phramacy	1	1.3%
No seed/cuttings available from neighbors	1	1.3%
Seed access		
No money to buy seed/poor finances or seed too high	10	12.5%
Seed quality		
Seed available is not good quality or the variety is not liked	0	0.0%
Sub-total: seed-related	**12**	15.0%
NON-SEED FACTORS OF PRODUCTION (limits)		
No/insufficient labor	0	0.0%
Illness/health problems	1	1.3%
No/insufficient land or land not appropriate/sufficiently fertile	19	**23.8%**
Lack of tools/tractor/ other machinery to farm	0	0.0%
Plant pests/diseases make production not possible	3	3.8%
Animals/predator make production not possible	0	0.0%
Lack of other inputs: controlled water supply/irrigation or fertilizer	2	2.5%
Low quality of inputs: eg. Fertilizer, herbicides, pesticides	0	0.0%
Price of inputs is too high	0	0.0%
Poor weather/rainfall	18	**22.5%**
Insecurity (e.g. theft)	0	0.0%
Sub-total: Factors of Production	**43**	**53.8%**
OTHER PRIORITIES/STRATEGIES		
Markets for crop or crop products not well-developed	0	0.0%
Other priorities than agriculture (e.g. have shop). Changing CROP priorities	13	16.3%
Other	12	15.0%
TOTAL	**80**	**100.0%**

3.4 AMHARA - Meher 2016 – Reasons for Sowing More

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
More seed available due to good harvest	3	20.0%
More seed available due to free seed	1	6.7%
Seed access		
More money to buy seed or seed price low	0	0.0%
Got credit to buy seed	0	0.0%
Vouchers (or NGO-provided cash)	0	0.0%
Seed quality		
Have especially good seed or good variety	3	20.0%
Sub-total: seed-related	**7**	**46.7%**
NON-SEED FACTORS OF PRODUCTION (opportunities)		
Good/increased labor	0	0.0%
Feeling strong/healthy	0	0.0%
Have more land/more fertile land	3	20.0%
Have tools/tractor, other machinery to help farm	0	0.0%
Have access to irrigation, fertilizer or other inputs (for example, stakes)	0	0.0%
Good weather/rainfall	3	20.0%
Good security (peace has arrived; less theft)	0	0.0%
Sub-total: Factors of Production	**6**	**40.0%**
OTHER PRIORITIES/STRATEGIES		
Well-developed /new markets for crop or crop products	0	0.0%
Have decided to give more priority to agriculture/ Changed CROP priorities	1	6.7%
Other	1	6.7%
TOTAL	**15**	**100.0%**

3.5 AMHARA - Belg 2016 – Seed Sources (% of Total)

Crop	Total kg sowed	% of total										
		Home saved /own stock	Carryover - maize hybrids	friends, neighbours , relatives	local market	agro-input dealer	community-based seed groups	govern-ment	NGO / FAO	contract seed growers	Other	TOTAL %
Maize	5.0						100.0					100.0
Irish potato	1510.0	26.5			19.9		9.9	30.5	13.2			100.0
Common beans	108.8			23.0	77.0							100.0
Chickpeas	173.8	40.3			41.3				18.4			100.0
Carrot	1.0				50.0		50.0					100.0
wheat	221.5	38.4			43.0		18.6					100.0
barley	4767.5	89.8			7.3			2.6	0.3			100.0
lentil	190.5	63.0		5.2	31.8							100.0
vetch	12.5				100.0							100.0
Teff	67.1	85.1			7.5				7.5			100.0
field pea	143.5	69.7			30.3							100.0
grass pea	7.5	40.0			60.0							100.0
Forage	15.0				100.0							100.0
TOTAL-all crops	7223.6	70.8	0.0	0.5	14.4	0.0	2.7	8.1	3.5	0.0	0.0	100.0

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3.6 AMHARA - Belg 2016 – More, Same or Less than Usual (%)

Crop	Number of HHs	% of HHs			Change sowing quantites for all growing the crop
		MORE	SAME	LESS	average % change
Maize	1	0.0	0.0	100.0	
Irish potato	17	23.5	29.4	47.1	*-1.27*
Common beans	6	0.0	33.3	50.0	*-17.33*
Chickpeas	15	6.7	73.3	20.0	*-1.72*
Carrot	1	0.0	100.0	0.0	
wheat	11	9.1	72.7	18.2	*-3.39*
barley	56	5.4	58.9	35.7	*-10.88*
lentil	9	11.1	44.4	44.4	*-17.50*
vetch	1	0.0	100.0	0.0	
Teff	15	0.0	46.7	53.3	*-23.11*
field pea	4	0.0	75.0	25.0	
grass pea	2	0.0	100.0	0.0	
Forage	1	0.0	100.0	0.0	
TOTAL-all crops	139	7.2	56.8	36.0	*-9.72*

3.7 AMHARA - Belg 2016 – Reasons for Sowing Less

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
No seed available in market/trader/agro-phramacy	0	0.0%
No seed/cuttings available from neighbors	1	2.0%
Seed access		
No money to buy seed/poor finances or seed too high	4	8.0%
Seed quality		
Seed available is not good quality or the variety is not liked	3	6.0%
Sub-total: seed-related	**8**	16.0%
NON-SEED FACTORS OF PRODUCTION (limits)		
No/insufficient labor	0	0.0%
Illness/health problems	0	0.0%
No/insufficient land or land not appropriate/sufficiently fertile	9	18.0%
Lack of tools/tractor/ other machinery to farm	0	0.0%
Plant pests/diseases make production not possible	2	4.0%
Animals/predator make production not possible	0	0.0%
Lack of other inputs: controlled water supply/irrigation or fertilizer	0	0.0%
Low quality of inputs: eg. Fertilizer, herbicides, pesticides	0	0.0%
Price of inputs is too high	0	
Poor weather/rainfall	25	**50.0%**
Insecurity (e.g. theft)	0	0.0%
Sub-total: Factors of Production	**36**	**72.0%**
OTHER PRIORITIES/STRATEGIES		
Markets for crop or crop products not well-developed	0	0.0%
Other priorities than agriculture (e.g. have shop).		
Other CROP priorities	2	4.0%
Other	4	8.0%
TOTAL	**50**	**100.0%**

3.8 AMHARA - Belg 2016 – Reasons for Sowing More

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
More seed available due to good harvest	0	0.0%
More seed available due to free seed	1	10.0%
Seed access		
More money to buy seed or seed price low	0	0.0%
Got credit to buy seed	0	0.0%
Vouchers (or NGO-provided cash)	0	0.0%
Seed quality		
Have especially good seed or good variety	2	20.0%
Sub-total: seed-related	**3**	**30.0%**
NON-SEED FACTORS OF PRODUCTION (opportunities)		
Good/increased labor	0	0.0%
Feeling strong/healthy	0	0.0%
Have more land/more fertile land	1	10.0%
Have tools/tractor, other machinery to help farm	0	0.0%
Have access to irrigation, fertilizer or other inputs (for example, stakes)	0	0.0%
Good weather/rainfall	3	30.0%
Good security (peace has arrived; less theft)	0	0.0%
Sub-total: Factors of Production	**4**	**40.0%**
OTHER PRIORITIES/STRATEGIES		
Well-developed /new markets for crop or crop products	2	20.0%
Have decided to give more priority to agriculture / changed crop priorities	1	10.0%
Other	0	0.0%
TOTAL	**10**	**100.0%**

3.9 AMHARA - Belg 2017 – Seed Sources (% of Total)

Crop	Total kg sowed	% of total										TOTAL %
		Home saved /own stock	Carryover - maize hybrids	friends, neighbours , relatives	local market	agro-input dealer	community-based seed groups	govern ment	NGO / FAO	contract seed growers	Other	
Maize	20.0	25.0	0.0	6.3	0.0	0.0	68.8	0.0	0.0	0.0	0.0	100.0
Irish potato	2950.0	65.3	0.0	1.7	5.1	0.0	6.8	14.4	6.8	0.0	0.0	100.0
Common beans	75.0	33.3	0.0	0.0	66.7	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Chickpeas	232.0	41.4	0.0	0.0	50.2	0.0	4.3	0.9	3.2	0.0	0.0	100.0
Tomato	0.2	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
wheat	425.6	65.1	0.0	2.9	18.4	0.0	0.6	20.0	0.0	0.0	0.0	107.0
barley	5316.5	86.0	0.2	0.0	8.1	0.0	0.0	5.7	0.0	0.0	0.0	100.0
lentil	250.3	74.5	0.0	0.0	25.5	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Teff	192.2	81.5	0.0	4.6	3.6	0.0	10.2	0.0	0.0	0.0	0.0	100.0
field pea	258.5	59.2	0.0	0.0	40.8	0.0	0.0	0.0	0.0	0.0	0.0	100.0
grass pea	3.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Forage	25.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
TOTAL-all crops	9748.2	75.9	0.1	0.7	10.5	0.0	2.5	8.4	2.1	0.0	0.0	100.3

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3.10 AMHARA - Belg 2017 – More, Same or Less than Usual (%)

Crop	Number of HHs	% of HHs			Change sowing quantites for all growing the crop
		MORE	SAME	LESS	average % change
Maize	4	0.0	75.0	25.0	*-9.38*
Irish potato	22	50.0	50.0	0.0	83.33
Common beans	5	20.0	60.0	20.0	*-2.50*
Chickpeas	24	16.7	58.3	25.0	*-0.44*
Tomato	1	0.0	100.0	0.0	
wheat	20	15.0	85.0	0.0	5.53
barley	56	8.9	64.3	26.8	*-0.61*
lentil	9	11.1	55.6	33.3	*-9.26*
Teff	33	15.2	60.6	24.2	2.09
field pea	11	9.1	36.4	54.5	*-10.63*
grass pea	1	0.0	100.0	0.0	
Forage	1	0.0	0.0	100.0	
TOTAL-all crops	187	16.6	62.6	21.9	8.89

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4.1 TIGRAY - Meher 2016 – Seed Sources (% of Total)

Crop	Total kg sowed	% of total										
		Home saved /own stock	Carryover - maize hybrids	friends, neighbours, relatives	local market	agro-input dealer	community-based seed groups	govern-ment	NGO / FAO	contract seed growers	Other	TOTAL %
Maize	370.3	**84.5**	0.0	7.4	6.8	0.0	1.4	0.0	0.0	0.0	0.0	**100.0**
Sorghum	933.1	**47.6**	0.0	4.1	29.9	0.0	0.0	7.5	6.2	0.0	0.0	95.3
Irish potato	100.0	0.0	0.0	0.0	0.0	0.0	0.0	**100.0**	0.0	0.0	0.0	100.0
wheat	3773.8	**30.3**	0.0	0.3	17.5	0.4	7.0	**38.2**	6.2	0.0	0.0	100.0
barley	3025.0	**53.3**	0.0	3.1	**41.5**	0.0	0.0	1.2	0.8	0.0	0.0	100.0
lentil	70.0	**100.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Teff	1447.0	**56.8**	0.7	0.5	20.4	0.0	0.0	13.6	5.3	0.0	0.0	97.3
field pea	47.5	**100.0**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
TOTAL-all crops	9766.6	**45.6**	0.1	1.8	25.8	0.2	2.8	18.9	4.0	0.0	0.0	99.1

4.2 TIGRAY - Meher 2016 – More, Same or Less than Usual (%)

Crop	Number of HHs	% of HHs			Change sowing quantites for all growing the crop
		MORE	SAME	LESS	average % change
Maize	19	26.3	42.1	31.6	**11.38**
Sorghum	64	20.3	60.9	18.8	**11.60**
Irish potato	1	0.0	100.0	0.0	0.00
wheat	68	25.0	54.4	20.6	**25.29**
barley	46	39.1	50.0	10.9	**37.36**
lentil	1	100.0	0.0	0.0	0.00
Teff	52	32.7	40.4	26.9	**7.35**
field pea	2	50.0	50.0	0.0	0.00
TOTAL-all crops	**253**	**28.5**	**51.8**	**20.2**	**19.16**

4.3 TIGRAY - Meher 2016 – Reasons for Sowing Less

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
No seed available in market	1	2.0%
No seed/cuttings available from neighbors	1	2.0%
Seed access		
No money to buy seed/poor finances or seed too high	2	3.9%
Seed quality		
Seed available is not good quality or the variety is not liked	1	2.0%
Sub-total: seed-related	**5**	9.8%
NON-SEED FACTORS OF PRODUCTION (limits)		
No/insufficient labor	2	3.9%
Illness/health problems	2	3.9%
No/insufficient land or land not appropriate/sufficiently fertile	11	**21.6%**
Lack of tools/tractor/ other machinery to farm	0	0.0%
Plant pests/diseases make production not possible	0	0.0%
Animals/predator make production not possible	0	0.0%
Lack of other inputs: controlled water supply/irrigation or fertilizer	1	2.0%
Poor weather/rainfall	6	11.8%
Insecurity (e.g. theft)	0	0.0%
Sub-total: Factors of Production	**22**	**43.1%**
OTHER PRIORITIES/STRATEGIES		
Markets for crop or crop products not well-developed	0	0.0%
Other priorities than agriculture (e.g. have shop)	2	3.9%
Changing Crop priorities or changing agricultural practices	0	0.0%
Other	21	**41.2%**
TOTAL	**51**	**98.0%**

4.4 TIGRAY - Meher 2016 – Reasons for Sowing More

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
More seed available due to good harvest	1	1.4%
More seed available due to free seed	3	4.2%
Seed access		
More money to buy seed or seed price low	0	0.0%
Got credit to buy seed	1	1.4%
Seed quality		
Have especially good seed or good variety	1	1.4%
Sub-total: seed-related	**6**	**8.3%**
NON-SEED FACTORS OF PRODUCTION (opportunities)		
Good/increased labor	2	2.8%
Feeling strong/healthy	0	0.0%
Have more land/more fertile land	11	15.3%
Have tools/tractor, other machinery to help farm	0	0.0%
Have access to irrigation, fertilizer or other inputs (for example, stakes)	0	0.0%
Good weather/rainfall	40	55.6%
Good security (peace has arrived; less theft)	0	0.0%
Sub-total: Factors of Production	**53**	**73.6%**
OTHER PRIORITIES/STRATEGIES		
Well-developed /new markets for crop or crop products	0	0.0%
Have decided to give more priority to agriculture	1	1.4%
Changed crop profiles or priority to certain crops	0	0.0%
Other	10	13.9%
TOTAL	**72**	**97.2%**

4.5 TIGRAY - Belg 2016 – Seed Sources (% of Total)

Crop	Total kg sowed	% of total										TOTAL %
		Home saved /own stock	Carryover - maize hybrids	friends, neighbours, relatives	local market	agro-input dealer	community-based seed groups	govern-ment	NGO / FAO	contract seed growers	Other	
Maize	419.5	27.3		4.8	37.8			3.6	11.0			84.5
Sorghum	10.0	100.0										100.0
Millets	7.5	100.0										100.0
Chickpeas	287.5				95.7			4.3				100.0
Onion	4.0				100.0							100.0
Pepper/piment	4.8				100.0							100.0
wheat	671.0	54.2			1.9	1.9	13.0	19.6	2.0			92.5
barley	1727.3	81.9		2.8	13.9				1.4			100.0
Teff	834.0	46.0		0.7	27.5			11.4	7.0			92.6
field pea	49.0				100.0							100.0
TOTAL-all crops	4014.5	57.1	0.0	1.8	24.3	0.3	2.2	6.3	3.6	0.0	0.0	95.6

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4.6 TIGRAY - Belg 2016 – More, Same or Less than Usual (%)

Crop	Number of HHs	% of HHs			Change sowing quantites for all growing the crop
		MORE	SAME	LESS	average % change
Maize	18	16.7	66.7	16.7	4.40
Sorghum	1	100.0	0.0	0.0	
Millets	1	100.0	0.0	0.0	
Chickpeas	3	33.3	66.7	0.0	
Onion	1	0.0	0.0	100.0	
Pepper/piment	4	50.0	50.0	0.0	
wheat	22	9.1	63.6	27.3	*-8.73*
barley	37	16.2	62.2	16.2	5.23
Teff	53	32.1	50.9	17.0	22.86
field pea	2	50.0	0.0	50.0	
TOTAL-all crops	142	23.9	56.3	18.3	12.01

4.7 TIGRAY - Belg 2016 – Reasons for Sowing Less

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
No seed available in market	0	0.0%
No seed/cuttings available from neighbors	0	0.0%
Seed access		
No money to buy seed/poor finances or seed too high	0	0.0%
Seed quality		
Seed available is not good quality or the variety is not liked	0	0.0%
Sub-total: seed-related	**0**	0.0%
NON-SEED FACTORS OF PRODUCTION (limits)		
No/insufficient labor	0	0.0%
Illness/health problems	0	0.0%
No/insufficient land or land not appropriate/sufficiently fertile	8	**30.8%**
Lack of tools/tractor/ other machinery to farm	0	0.0%
Plant pests/diseases make production not possible	1	3.8%
Animals/predator make production not possible	0	0.0%
Lack of other inputs: controlled water supply/irrigation or fertilizer	0	0.0%
Poor weather/rainfall	12	**46.2%**
Insecurity (e.g. theft)	0	0.0%
Sub-total: Factors of Production	**21**	**80.8%**
OTHER PRIORITIES/STRATEGIES		
Markets for crop or crop products not well-developed	0	0.0%
Other priorities than agriculture (e.g. have shop)	0	0.0%
Changing Crop priorities or changing agricultural practices	0	0.0%
Other	5	19.2%
TOTAL	**26**	**100.0%**

4.8 TIGRAY - Belg 2016 – Reasons for Sowing More

Reasons	N	% of responses
SEED- RELATED (or indirectly linked to seeds)		
Seed availability		
More seed available due to good harvest	0	0.0%
More seed available due to free seed	2	5.9%
Seed access		
More money to buy seed or seed price low	1	2.9%
Got credit to buy seed	0	0.0%
Seed quality		
Have especially good seed or good variety	0	0.0%
Sub-total: seed-related	**3**	**8.8%**
NON-SEED FACTORS OF PRODUCTION (opportunities)		
Good/increased labor	2	5.9%
Feeling strong/healthy	0	0.0%
Have more land/more fertile land	5	14.7%
Have tools/tractor, other machinery to help farm	0	0.0%
Have access to irrigation, fertilizer or other inputs (for example, stakes)	0	0.0%
Good weather/rainfall	16	47.1%
Good security (peace has arrived; less theft)	0	0.0%
Sub-total: Factors of Production	**23**	**67.6%**
OTHER PRIORITIES/STRATEGIES		
Well-developed /new markets for crop or crop products	0	0.0%
Have decided to give more priority to agriculture	2	5.9%
Changed crop profiles or priority to certain crops	0	0.0%
Other	5	14.7%
TOTAL	**34**	**97.1%**

4.9 TIGRAY - Belg 2017 – Seed Sources (% of Total)

Crop	Total kg sowed	Home saved /own stock	Carryover - maize hybrids	friends, neighbours , relatives	local market	agro-input dealer	community-based seed groups	government	NGO / FAO	contract seed growers	Other	TOTAL %
Maize	465.5	26.7	0.0	1.6	37.4	0.0	0.0	28.9	4.0	0.0	0.0	98.8
Sorghum	51.3	0.0	0.0	48.8	51.2	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Millets	11.3	66.7	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Irish potato	475.0	0.0	0.0	0.0	0.0	0.0	42.1	57.9	0.0	0.0	0.0	100.0
Chickpeas	141.3	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Tomato	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cabbage	7.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0
Onion	5.5	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Pepper/piment	11.4	5.5	0.0	0.0	72.5	0.0	0.0	0.0	0.0	0.0	0.0	78.0
garlic	37.5	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
wheat	1739.3	46.5	0.0	1.6	6.1	0.0	0.0	45.4	0.4	0.0	0.0	100.0
barley	1876.0	77.0	0.0	0.0	14.7	0.0	0.0	8.3	0.0	0.0	0.0	100.0
Teff	991.0	68.6	0.5	3.8	8.7	0.0	0.0	14.6	1.3	0.0	0.0	97.5
field pea	145.0	17.2	0.0	15.5	25.9	0.0	0.0	41.4	0.0	0.0	0.0	100.0
TOTAL-all crops	5958.1	52.5	0.1	2.0	14.5	0.0	3.4	26.3	0.7	0.0	0.0	99.4

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4.10 TIGRAY - Belg 2017 – More, Same or Less than Usual (%)

Crop	Number of HH	% of HHs			Change sowing quantites for all growing the crop
		MORE	SAME	LESS	average % change
Maize	25	16.0	68.0	12.0	2.53
Sorghum	5	0.0	100.0	0.0	0.00
Millets	2	0.0	100.0	0.0	
Irish potato	3	66.7	0.0	0.0	
Chickpeas	6	16.7	83.3	0.0	27.78
Tomato	1	0.0	100.0	0.0	
Cabbage	1	100.0	0.0	0.0	
Onion	3	0.0	100.0	0.0	
Pepper/piment	6	0.0	100.0	0.0	0.00
garlic	1	0.0	100.0	0.0	
wheat	26	23.1	65.4	11.5	60.67
barley	40	15.0	60.0	25.0	*-4.61*
Teff	50	24.0	58.0	18.0	17.65
field pea	4	50.0	50.0	0.0	59.38
TOTAL-all crops	173	19.7	65.9	14.5	16.97

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