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The U.S. Government's Global Hunger & Food Security Initiative



Seed Demand Forecasting in Ethiopia

ASSESSMENT AND RECOMMENDATIONS FOR A TECHNICAL ROADMAP



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Feed the Future Consortium Partners in the Feed the Future Global Supporting Seed Systems for Development activity:



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This assessment was made using data collected from stakeholders in the seed value chain. Key informants interviewed at the federal Ministry of Agriculture, regional, zonal, woreda and kebele agriculture bureaus/offices in Amhara and Oromia, Ethiopian Seed Enterprise, agricultural research institutes at federal level and Amhara and Oromia regions, private seed companies and seed producer cooperatives provided the data used for this assessment. Without their willingness to spare their time to respond to our questions, this report would not have been possible.

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Acronyms

ACC	Agricultural Commercialization Cluster
ASE	Amhara Seed Enterprise
AGP	Agricultural Growth programs
ARARI	Amhara Region Agricultural Research Institute
ARI	Agricultural Research Institute
ARBA	Amhara Region Bureau of Agriculture
ATA	Agricultural Transformation Agency
BOA	Bureau of Agriculture
COOP	Cooperative
CSA	Central Statistical Agency
DAs	Development Agents
DSM	Direct Seed Marketing
EABC	Ethiopian Agricultural Business Corporation
EFY	Ethiopian Fiscal Year
EGS	Early Generation Seed
EIAR	Ethiopian Institute of Agricultural Research
FSCs	Farmers' Seed Cooperatives
ESE	Ethiopian Seed Enterprise
FTCs	Farmers Training Centers
ICT	Information Communication Technology
IQQO	Oromia Institute of Agricultural Research
MOA	Ministry of Agriculture
NGO	Non-government organization
RBOA	Regional Bureau of Agriculture
ORBA	Oromia Region Bureau of Agriculture
OSE	Oromia Seed Enterprise
PSC	Private Seed Company
PSE	Public Seed Enterprise
QDS	Quality Declared Seed
SMS	Subject Matter Specialist

1. Executive Summary

Ethiopia is one of the few countries in sub-Saharan Africa to have a working process and system that forecasts demand for seed across all administrative levels in the country. The system is used every year to forecast demand for certified seed and early generation seeds (EGS). However, despite best efforts, the current system is often unable to match the demand and supply of seeds. Thus, a well-recognized priority of the Ethiopian government and national stakeholders is to strengthen and modernize the current system and processes in place. To that end, Feed the Future Global Supporting Seed Systems for Development activity (S34D), implemented by CRS and funded by the Bureau for Resilience and Food security (RFS) and the Bureau for Humanitarian Assistance (BHA), undertook the current study, funded by USAID Ethiopia, to assess the present system, and methods employed to forecast demand, with the goal to provide a roadmap on what the next steps could be to modernize the approach such that the gap between effective and realized demand narrows over time.

Using the framework of a seed data value chain, and bottom-up approach, S34D designed customized survey instruments for each of the different administrative levels, as well as national and regional stakeholders who perform critical functions in the forecasting process. Thirty-one key informant interviews were conducted to collect information regarding the system and processes used at present. These informants spanned across more than two dozen institutions and administrative levels in Amhara and Oromia regions.

Results indicate that Ethiopia has a system that works and there is a strong momentum amongst actors and participants to improve the processes, to modernize the system, and strengthen the methodology used. For example, currently there is no digitized data archive that could conduct panel analyses and trends analyses using rigorous econometric approaches. Therefore, shifts in the demand curve cannot be estimated from the present system. The inability to do that leads to mismatches in demand and supply on the ground. Additionally, market information is hardly used (nor collected) in the methodology to estimate demand – leading to biased results. For example, survey results indicate stakeholders would appreciate the collection and utilization of important parameters such as seed-grain price ratio.

The process is not always inclusive – gender and age disaggregated information is neither uniformly collected nor systematically used throughout the process. Furthermore, data adjustments that are made at different administrative levels are not always transparent and well-documented. The seed price setting includes only the public seed enterprises and omits the private sector players. The actual production costs, and associated cost functions, are not transparent. The final price at which the seeds are sold, varies based on distribution and handling costs. The process is furthermore complicated through various communication channels – often transmitting similar information bits – without the use of a single platform, leading to time lapse in receipt of the data.

Following the analyses, results and findings were disseminated through a stakeholder validation workshop (Annex 11). Seed demand forecasting is not just about data and methodology, it is also about – infrastructure, communication, technical capacity, resource mobility, awareness creation about both new and existing varieties demanded at markets, seed distribution, and marketing. Incorporating feedback and comments from stakeholders, S34D has compiled a set of near-term recommendations. However, a multi-stakeholder partnership is required to implement the suggested pathway. To do that, S34D suggests a national seed demand forecasting working group to forge ahead.

Recommendations

- Move from paper to digital data collection at all administrative levels.
- Build technical capacity especially at grassroots levels.
- Collect age and sex disaggregated data to assess preferences of women and the youth.
- Collect and share good quality near real-time information on the seed-grain price ratio to increase market transparency.
- Improve the methodology of forecasting (use econometrics to do predictive modeling; big data and micro-level information; near real-time forecasts etc.). Capture shifts in demand.
- Initiate data coordination nodes to exchange both micro and macro level data necessary to support econometric models (in collaboration with the CSA, ATA, MoA, World Bank, and groups that deal with statistics from space, weather data, etc.).
- Put a centralized database in place to increase transparency and strengthen the documentation system which also enables online tracking.
- Establish a digital library with data archives across space and time.
- Revisit the price setting strategy if the country wishes to liberalize the seed sector. As a first step, seed quality should be factored in while setting prices. Seed pricing mechanism should also be checked with grain price.
- Create awareness and develop marketing strategies (for new and existing varieties which have a huge market pull) – farmer segmentation models; WTP approaches; constructive feedback mechanisms.
- Increase transparency by including all stakeholders and the private sector in seed demand forecasting, price setting and seed distribution.
- Provide feedback to the farmers regarding the response (if they get the demanded seed) until the seed distribution time. A lack of feedback to the farmers on the status of their order is discouraging them to register their demand in the future.
- There should be standardized and well-documented adjustments to revise data at all levels.
- Pilot approaches and case studies with unions who are showing interest in seed demand forecasting (example: Hetosa Unions).
- The EGS forecasting process should be standardized along regions and within regions. Applying uniform approaches and transparency in the process needed.
- Finalize EGS demand forecasting and the decision for its production period should not be later than the end of February each year.

2. Introduction

One of the bottlenecks identified in the seed sector in Ethiopia is the mismatch between seed production volumes and farmers' demand. Currently Ethiopia faces significant challenges in forecasting effective seed demand – both in variety and volume (Seed System Development Strategy, 2020 MoA/ATA). This constraint was repeated as a major bottleneck in every stakeholder consultation held by S34D. Therefore, S34D initiated an assessment of the system and processes in place to forecast demand for improved seeds at varietal levels. Furthermore, currently, a market-oriented seed demand assessment system is missing. The system also lacks flexibility to incorporate changes in demand due to shifts in demand by farmers/pastoralists (National Seed Policy, 2020).

The goal of this study was to assess, document, and analyze the current seed demand forecasting system in Ethiopia and produce a technical road map to modernize the seed demand forecasting processes. Results of the analyses were disseminated at a stakeholder validation workshop to arrive at recommendations for a roadmap to modernize the demand forecasting system in the country. Thus, the specific objectives of the current assessment were:

- i. Assess the existing seed demand forecasting process, focusing on who is doing what, how, and when.
- ii. Take inventory of current data sources, and gaps that will need to be filled.
- iii. Develop a technical road map that details approaches and possible technical ways to efficiently assess seed demand. The technical road map also includes evaluative approaches to incentivize seed producers and distributors to produce the correct amount of seed, including how the government and stakeholders will undertake a collaborative approach with actors across the seed value chain, to forecast demand based on current market conditions.

Section 3 describes the approach used for this assessment. The certified seed demand forecasting process is illustrated in **Section 4** while that for Early Generation Seeds (EGS) is described in **Section 5**. As the demand for new varieties is correlated with awareness creation, **Section 6** explains how awareness is created by different seed value chain actors in Ethiopia. The strengths and weaknesses of the system are analyzed in **Section 7**. Key findings and recommendations for the road map are provided in **Section 8** while concluding remarks are presented in **Section 9**.

3. Study Approach

In Ethiopia, both formal and informal seed systems play an important role. However, for most crop varieties, seeds are exchanged through informal seed system channels (Atilaw et al., 2017; MoA & ATA, 2017; Bishaw et al., 2018). With that distinction in mind, the study focused on crops prioritized by the government and those that are produced and exchanged through the formal seed system. The focus was to assess the system, process, and data needs for both certified and early generation seeds (EGS).

First, the crop varieties that are provided by the formal seed system were identified, and then second, the regions/zones that supply and use those crop varieties were chosen as the sample study area for our assessment. Once the regions were identified, preliminary discussions were made with key informants and stakeholders to narrow down the zones, woredas, and kebeles as administrative units to provide the information needed. Once the study areas (regions, zones, woredas, kebeles) were selected, a bottom-up seed demand forecasting and top-down seed distribution approaches were employed to identify key informants for interview purposes. Preliminary discussions with stakeholders were also conducted to narrow down the experts who could serve as key informants. Based on the functions these stakeholders perform within the seed value chain, customized questionnaires (survey instruments given in Annex 2) were designed for each level of the administration and associated functions performed for the seed demand forecasting process.

3.1 Crop Selection

As shown in **Table 3.1**, cereal crops are the major sources of staple food in Ethiopia occupying 81.5% of the total crop area and 88.5% of the total production (CSA, 2020). The top five crops (Teff, Barley, Wheat, Maize, Sorghum) covered 77.3% of all crops or 95% of the cereal crops' area planted in Ethiopia during 2019/20 production season (CSA, 2020). The five crops covered 92% and 98% of the area allocated to cereals in Amhara and Oromia, respectively during the same season. Teff area was the largest followed by maize area, nationally as well as in the two regions. Barley occupied the smallest proportion of land among the five cereals. Therefore, conducting the survey in Amhara and Oromia regions focusing on the 5 cereal crops: teff, maize, wheat, sorghum and barely is highly representative of the seed demand forecasting processes in the country.

Table 3.1: The importance of prioritized grain crops based on area and production at national level

Category	Crop	Area (ha)	% Area	Production (quintal)	% Production
		12,862,778.84	100.00	335,199,823.90	100
Cereals	Total cereals	10,478,218.03	81.46	296,726,476.94	88.52
	Teff	3,101,177.38	24.11	57,357,101.87	17.11
	Barley	950,742.01	7.39	23,780,102.92	7.09
	Wheats	1,789,372.23	13.91	53,152,703.28	15.86
	Maize	2,274,305.93	17.68	96,357,345.00	28.75
	Sorghum	1,828,182.49	14.21	52,655,800.59	15.71
	Other cereals	534,437.99	4.16	13,423,423.29	4.01
Pulses	Total pulses	1,563,768.72	12.16	30,051,986.62	8.97
	Faba beans	466,697.68	3.63	10,067,518.28	3.00
	Chick peas	208,837.91	1.63	4,351,932.14	1.30
	Haricot beans	281,083.49	2.19	4,855,470.93	1.45
	Other pulses	607,149.65	4.71	10,777,065.28	3.22
Oilseeds	Total oilseeds	820,792.09	6.38	8,421,360.34	2.51

	Sesame	375,119.95	2.92	2,626,541.89	0.78
	other oilseeds	445,672.14	3.47	5,794,818.44	1.74

Source: CSA (2019/2020)

Four of the five crops (wheat, barley, tef and maize) are priority crops of the government's Agricultural Growth Program (AGP) and the currently operating Agricultural Commercialization Cluster (ACC) (ATA, 2019)¹. The production of wheat and malt barley is of the highest priority not only for food security purposes but also for import substitution by boosting domestic production. To support this government initiative, wheat production under irrigation is increasing with close follow up of the government since 2020 (MoA, 2021). Although teff is a major crop only in Ethiopia, its global importance is increasing because it is gluten free and considered a healthy food (Fikadu et al., 2019), indicating tremendous export potential in addition to meeting the increasing national demand. Sorghum is a key food security crop in moisture stressed parts of the country such as the eastern, and north-eastern parts of Ethiopia because it is drought tolerant (Woldetensaye, 2018). The five crops are identified as priority among grain crops in the government's ten year strategic perspective plan (MoA, 2021). **Table 3.2** maps the crops against the formal seed system, ACC, and purposes for which they are grown.

Table 3.2: Prioritizing crops for seed demand forecasting

Crop	Existence in the formal seed system (Y/N)	National Priority according to GTP or ACC (Y/N)	Purpose				
			Commercial (local market)	Staple	Food security	Import substitution	Export
Teff	Y	Y	Y	Y	Y		
Barley	Y	Y	Y (malt)	Y	Y	Y (Malt)	
Wheat	Y	Y	Y	Y	Y	Y	
Maize	Y	Y	Y	Y	Y		
Sorghum	Y	Y	Y	Y	Y		
Faba bean	Y	Y	Y				
Haricot bean	Y	Y	Y				
Chickpea	Y	Y	Y				
Sesame	N	Y					Y
Tomatoes	Y	Y	Y			Y	
Onion	Y	Y	Y				
Potatoes	N	Y	Y				
Bananas	N	Y	Y				
Mangoes	N	Y	Y				
Coffee	N	Y					Y

3.2 Sampling the Study Area for Data Collection

Within the two major cereal producing regions (Amhara and Oromia), the senior experts in the BoAs were consulted to identify major cereal producing zones and woredas. The criteria for selection at each level was the high potential for production of the selected crops. **Table 3.3** provides a list of all the study areas at different administrative levels. **Figure 1** spatially shows those subnational geographies.

¹ The objectives of the ACC are to increase incomes of small-holder farmers; increase exports; substitute imports and develop domestic market; increase industrialization; and create off-farm employment opportunities. The objectives are primarily achieved through increased production and productivity, which in turn, entails adequate provision of inputs such improved seeds, fertilizers, irrigation and machinery

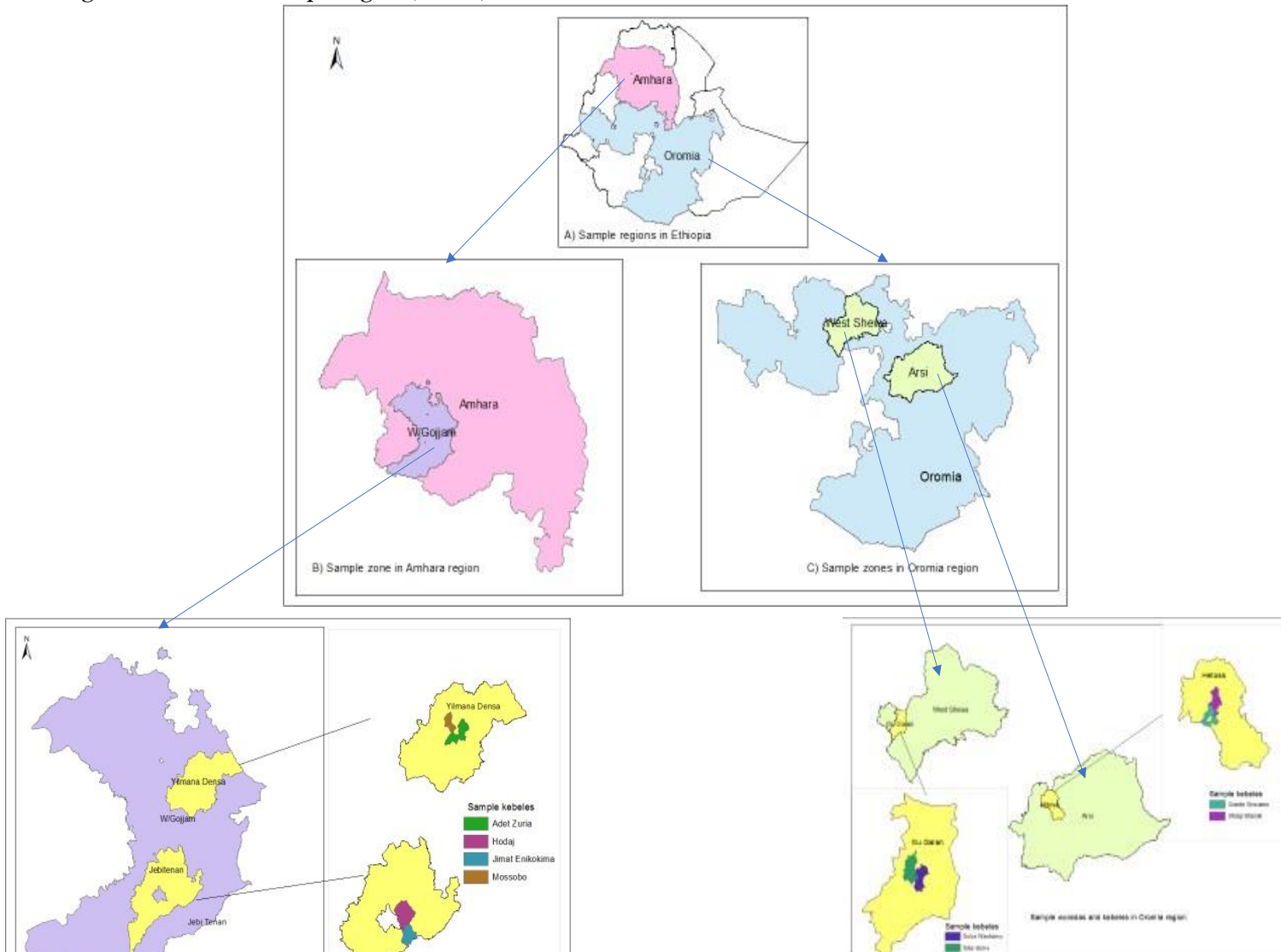
Table 3.3: Sample zones, woredas and kebeles for seed demand forecasting

Region	Zone	Woreda	Kebele	ARI*	Public Seed Enterprises	Private Seed Enterprises	Seed Cooperatives & Unions
Amhara	West Gojjam	Jabi Tahina	Jimat Enkokima	ARARI; EIAR	ASE; ESE	Yimam Tesema; Nono PLC	Ediget Bandnet Seed Union; Avolla Goshye
			Hodaj				
		Yilmana Densa	Adet Zuria				
			Mossobo				
Oromia	Arsi	Hetosa	Gonde Sincamo	IQQO; EIAR	OSE; ESE	Amouri HYV and Agri Prod. PLC; Nono PLC	Hetosa Union
			Shaqi sherak				
	West Shewa	Illu Galan	Goba Washamo				
			Siba biche				
							Ambo Union

* ARI= *Agricultural Research Institutes; see acronyms for the others*

The zones in the selected regions were randomly selected. In the Amhara region, west Gojjam is a potential area for production of all the crops selected for the study. In Oromia, the Arsi zone is more suitable for wheat and barley while west Shewa is a suitable zone for maize, sorghum and teff. The woredas and kebeles within the zones were also selected in a random fashion.. Relative location of the study areas is given in **Figure 1**.

Figure 1: Location of sample regions, zones, woredas and kebeles



3.3 Sampling Stakeholders for Interview

The sampling of stakeholders for this study followed a mix of purposive and stratified sampling procedures to ensure adequate coverage of the seed value chain actors and stakeholders at different administrative levels. A bottom-up seed demand forecasting was employed in Ethiopia where the demand estimation starts at kebele level and passes up through all administrative levels until it reaches the federal MoA. On the other hand, the seed distribution employed a top-down approach where the distribution decisions are made at the top of the administrative levels and are passed down the channel until they reach the kebele level.

The data collection methodologies followed these approaches to adequately describe the processes of seed demand estimation and seed distribution. First preliminary discussions were held with key experts in the input directorate of MoA to help identify institutions and experts and second, within those organizations identified, experts were selected for the in-depth interviews. The list of stakeholders/institutions and the persons interviewed is given in **Annex 1**.

Table 3.4 presents the number of key informant interviews (KII) conducted. In total, 31 key informant interviews were conducted. Of these interviews, 4 KIIs were conducted with stakeholders selected at the federal level while 13 and 14 KIIs were conducted in Amhara and Oromia regions, respectively. In total, 47 persons were interviewed, of whom 11% were female key informants (**Table 3.5**).

Table 3.4: Number of KIIs to be covered at different levels

Sr. No.	Tools	Federal	Amhara	Oromia	Total
1	MoA	1			1
2	RBoA		1	1	2
3	Zonal		1	2	3
4	Woreda		2	2	4
5	Kebele		4	4	8
6	Private seed company	1	1	1	3
7	Public seed enterprise	1	1	1	3
8	Coop/union		2	2	4
9	Research Institute	1	1	1	3
Total		4	13	14	31

The stakeholders interviewed were informed about the purpose of the survey to secure their consent to respond to the survey questions. All the contacted stakeholders were willing to respond to the survey questions. The survey questions were structured to suit to the type of data collected by different stakeholders at different levels as listed in **Annex 2**. The interview was conducted face-to-face (following COVID-19 protocols and safety measures²) by enumerators who have experience in the seed system.

Table 3.5: Number of persons interviewed

Level	Federal			Amhara			Oromia			Total			% Female
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	
MoE		1	1							0	1	1	100
Regional BoA				1	1	2	1		1	2	1	3	33
Zone				3		3	2		2	5	0	5	-
Woreda				6		6	3	1	4	9	1	10	10
Kebele				8		8	3	1	4	11	1	12	8
Public Seed Enterprise	1		1	2	1	3	1		1	4	1	5	20
Private seed company	1		1	1		1	1		1	3	0	3	-
Seed Prod. Coops				3		3	2		2	5	0	5	-
Research	1		1	1		1	1		1	3	0	3	-
Total	3	1	4	25	2	27	14	2	16	42	5	47	11

3.4 Data Collection Instruments

The data needed for this survey were collected from different sources, including: kebele³, woreda, zonal, regional bureaus of agriculture, federal ministry of agriculture (mainly input directorate at each level), public seed enterprises, (namely the Ethiopian Seed Enterprise (ESE), Oromia Seed Enterprise (OSE) and Amhara Seed Enterprise (ASE)), seed producer cooperatives/seed unions, multipurpose cooperatives, private seed companies, as well as regional and federal agricultural research institutes (mainly technology multiplication directorate at each institute).

² S34D followed measures specified by both the USAID guidelines and as well as those followed by CRS Ethiopia country office.

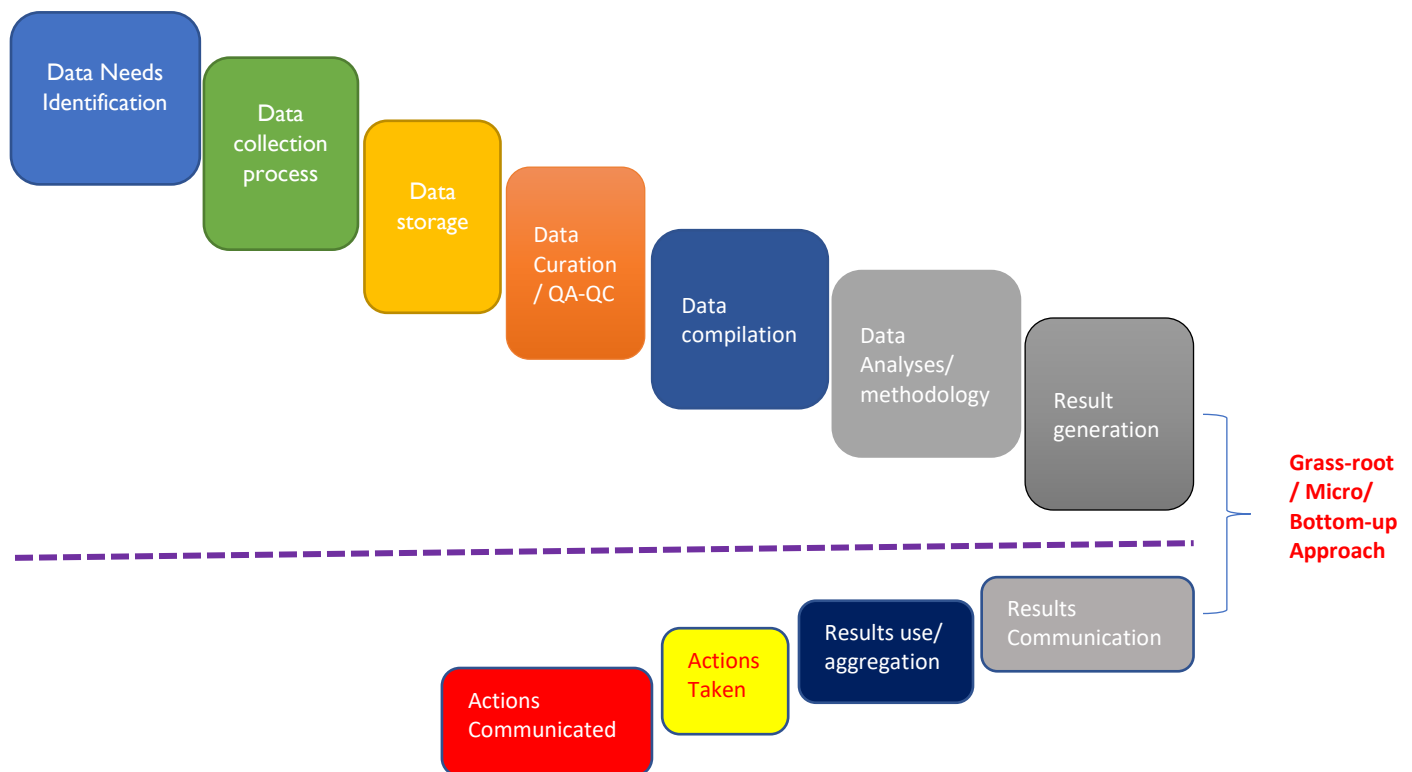
³ Kebele is the lowest administration structure in Ethiopia

Given that the nature of the roles and responsibilities played by each of these stakeholder groups vary – especially between certified and EGS seed classes – S34D designed custom questionnaires for each of the stakeholder groups. Data collection instruments were prepared for each category of stakeholders to enable the use of similar tools for seed value chain actors that have similar functions and roles in the seed demand forecasting. **Annex 2** provides the instruments used for this study.

The structure of the data collection instrument was framed following the schematic flow given in **Figure 2**. It covers a bottom-up flow of seed demand data and top-down distribution of demanded seed and related communication. The information gathered from the stakeholder interviews included a data requirement for certified seed and EGS demand forecasting, data collection processes, data storage, method of analyses, compilation, result generation, communication of results along the chain, aggregation and actions taken at each level. S34D specifically designed custom questionnaires for each of the following groups of stakeholders:

- Ministry of Agriculture and Regional Bureau of Agriculture
- Zonal, Woreda and Kebele Agriculture Offices
- Public Seed Enterprise
- Private Seed Company
- Seed Producing Cooperatives
- Agricultural Research Institute

Figure 2: Conceptual frame for designing seed demand data collection survey instruments



*Who is doing what; How is it being done; Where is that being done (at what level)?
 What resources / capacity is used to do this; With whom is all this being done (partnerships); Contact / Person responsible & Accountable; Gaps in Systems / capacity strengths & weaknesses?*

Data were collected using the data collection instruments and formats prepared for each group of the stakeholders listed above. In addition, given that each of the stakeholder groups used their own instruments to collect data for use in the forecasting processes, S34D collected those instruments used by different admin levels as well. However, as many of them were in local vernacular, S34D translated them into English. **Annex 3** shows the instruments that the kebele, woreda, zonal and regional BoA use for seed demand data collection and compilation. The format shows that each region uses some specific format for collecting seed demand at different levels. For example, in Oromia, demand for other inputs such as fertilizer is also collected along with the demand for improved seeds. It is also important to note that the demand for certified seed and EGSs is collected at the same time.

4. Assessment of Certified Seed Demand Forecasting

This section describes the processes of certified seed demand data collection by each of the actors in the seed value chain, instruments used for data collection, type of data collected, aggregation and analysis. The data collection process has been schematically presented at system level (section 4.1) and presented for each category of stakeholders at different levels (**Annex 4**). The role of each category of stakeholders and flow seed demand data between them are also discussed in this section.

4.1 Systemic Process and Roles and Responsibilities

Figure 3: Schematic process – Demand forecasting of certified seeds in Ethiopia

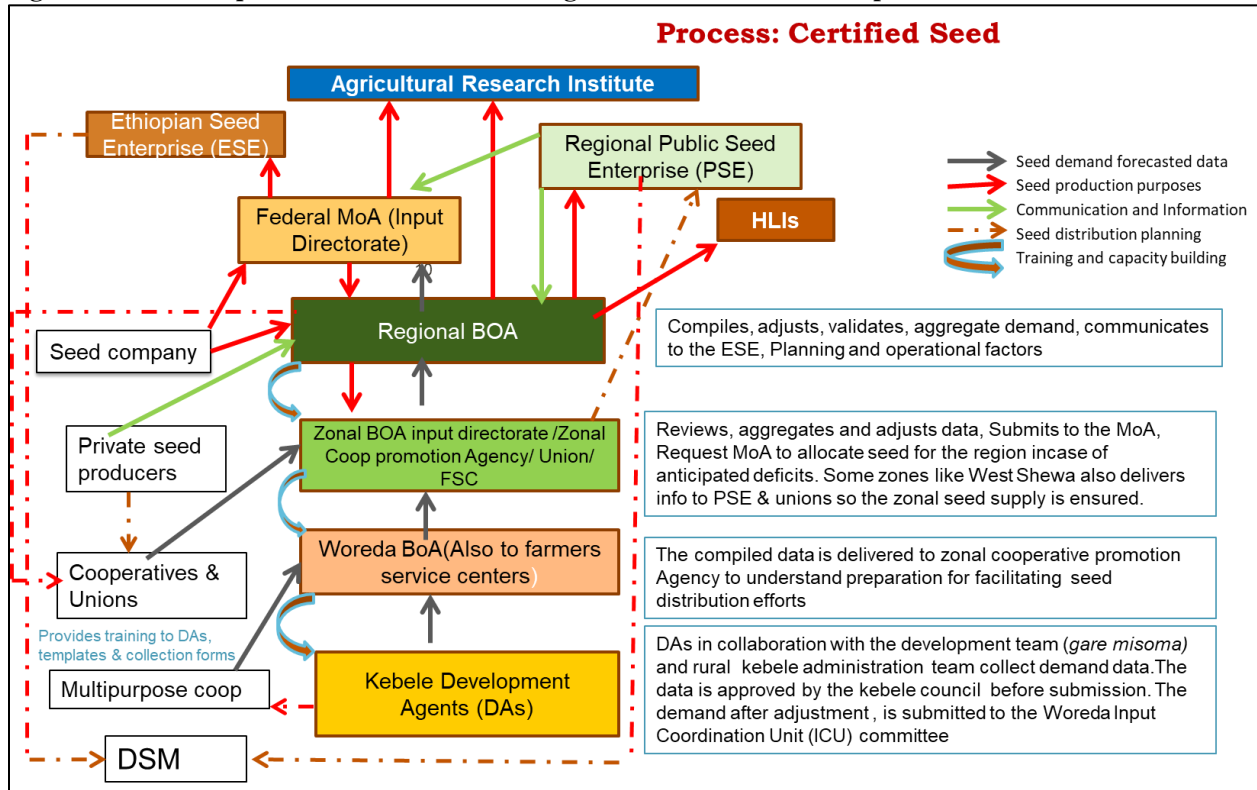


Figure 4 schematically illustrates the process of certified seed demand forecasting in Ethiopia. Annex 4 provides details of the certified seed demand forecasting processes at each administrative level, where the process of data collection, compilation, analysis, and communication are presented separately for each stakeholder.

The stakeholders involved in certified seed demand data play different roles. The primary source of the demand data comes from the farmers where data is collected by the development agents (DAs) with support of the kebele development council. The data is collected using the format shared by the zone to the woreda (see Annex 2.2). Training on the demand data collection is given starting from region down to zone and woreda. The DAs are trained at woreda level by the woreda experts who are in turn trained by the zonal agriculture office. Thus, there is chain of roles and responsibilities that includes certified seed demand collection, compiling, aggregation, and storage from kebele up to the MoA and communication down from the MoA to kebele level. These roles are summarized in Table 4.1. A brief description of the roles and responsibilities is given below.

- i. Kebele: the role of kebele agriculture office or DA is to collect demand for certified seed from individual farmers with the assistance of the kebele development groups. The data on crop type, variety, amount, etc. is collected using the format received from the woreda agriculture office. The data is then checked for under-estimation or exaggeration, based on the quantity of seed used in the previous year and the land cultivated. Adjustments may be made. The data is compiled by crop, variety, quantity of seed and area at kebele level. Data also shows the number of male and female farmers who need the certified seed during the following production season. The compiled data is submitted to the woreda agriculture office. The chain for certified seed demand forecasting process is schematically summarized in **Annex 4.5**.
- ii. Woreda agriculture office: The woreda agriculture office provides data collection formats for the DAs and trains them. It also monitors the seed demand data collection. It receives the collected certified seed demand from each kebele. Multipurpose cooperatives submit their demand for certified seeds to the woreda BoA, which compiles the demand data at woreda level by crop, variety, and quantity demanded. It is checked against the previous years' data and adjustments are made if needed. Then the compiled data is transferred to the zonal agriculture office.
- iii. Zonal agriculture office: this office prepares seed demand data collection formats with the guidance of the regional BoA and passes it to the woredas. This enables collection of similar demand data at woreda as well as kebele level. The zone coordinates the seed demand data collection process at woreda level. It receives training on seed demand data collection and trains the woreda experts who further train the DAs. The zone collects woreda level certified seed data from the woreda BoA, cooperatives, and unions organized at zone level. Then, it compiles the data and further checks for accuracy and adjusts, if necessary, based on past years' data. The zone aggregates the demand data by woreda and transfers it to the regional BoA.
- iv. Regional BoA: The bureau is responsible for training of the zonal and woreda experts on seed demand data collection. Training of a wide range of stakeholders enables standardizing the data collection protocols, which ease aggregation at higher levels. The regional BoA verifies the data quality and collects sample data from zones and woredas to ensure the data quality, make adjustment also based on past years' trend. The data is transferred to seed producers in the region, cooperative agency and the federal MoA to fill the gaps between seed available in the region and the demand (red arrow in **Figure 3**). In some instances, the regional BoA advises the zones to replace varieties which cannot be supplied with suitable adapted varieties, when the seed cannot be supplied, or the quantity is in short supply.
- v. Federal MoA: The MoA coordinates national level seed demand data collection. It gets the seed demand data from regional BoAs. During the data collection, the MoA follows up the progress made by the regions. It compiles the seed demand data received from regional BoA, compares with past trends, and make some adjustments as necessary. It provides the seed demand data to the Ethiopian Seed Enterprise and other seed producers. The MoA plays a major role in coordinating seed rationing between regions and observing price setting.

Table 4.1: Role of key stakeholders in certified seed demand forecasting

Role	Kebele	Woreda	Zone	BoA	MoA
Use format prepared by ... for data collection	Sent by the Woreda	Share format prepared by zone to kebele	Prepare uniform format and share with woreda		
Provide training for own and subordinate staff		Train DAs	Train Woreda experts	Train zone and woreda experts	
Facilitate/coordinate data collection		Monitor the data collection by DA/kebele	Coordinate the woredas	Coordinate with zones seed demand data collection	Coordinate seed demand collection at national level
Collect data from...	Individual farmers	Summary of data from kebele	Summary of data from woreda	Summary of data from zone	Summary of data from regions
Check quality and make adjustment	Check if the total quantity fits land available and adjust based on last year trend	Check quantity, compare with last year trend and make adjustment			Use the past trend to make adjustments
Compile data	Aggregate data by crop, variety, number of farmers and gender	Aggregate data by crop, variety, number of farmers and gender and coops	Aggregate data by crop, variety, number of farmers and gender		
Submit data to other stakeholders	Woreda Agr Office	Zonal Agr Office	Regional BoA	Data reported to seed producers in the region, coop agency, MoA (to fill regional seed gaps)	Regional and Federal Seed Enterprise
Feedback				Advise zone to replace unavailable varieties	

* *Seed Enterprise*

- vi. Public seed enterprise: The regional seed enterprises (such as Amhara Seed Enterprise and Oromia Seed Enterprise) receives the demand for certified seed from the regional BoA while the federal seed enterprise (the Ethiopian Seed Enterprise) receives the seed demand information from the MoA. But the enterprise modifies this data based on the enterprise certified seed sales performance during the previous year to determine seed production. The plan also depends on availability of basic seed, availability of suitable land by the out-growers and the enterprise, and the strategic plan of the firm, seed left over during the past year.
- vii. Private seed companies: Private seed companies in both regions do not directly forecast the demand for certified seed. The seed demand is communicated to the seed companies operating at national level by the MoA while regionally based seed companies get the demand data from the regional BoA. The seed companies, instead, estimate their market shares based on seed sales performance during the last year and plan for production. The plan for production depends on availability of basic seed, willingness of out-growers to produce the variety, land availability by considering the crop rotation history and suitability, and companies own indicative plan.
- viii. Cooperatives: More than demand forecasting, cooperatives determine the certified seed production plan, which is based on the previous year's seed demand, availability of land for seed production including the land that can be made available by cooperative members, the type of varieties demanded (obtained from BoA), and availability of basic seed for certified seed production. Based on their production plan, the primary cooperatives submit their demand for certified seed to the woreda BoA and cooperative unions organized at zone level submit their seed demand to the zonal BoA. More importantly, cooperatives play a crucial role in seed distribution, working closely with the

bureaus of agriculture. Cooperatives also serve as agents for seed distribution for public seed enterprises (both federal and regional) and private seed companies (broken arrow in **Figure 3**).

Decisions are made at different levels. As discussed above, the quantity of certified seed demanded for different varieties are compiled and aggregated at kebele levels and communicated to woreda level, which communicates the woreda level demand to the zone and the zone to the regional level. Regions also communicate the seed demand gaps to the MoA and the seed demand of the region to the seed producers within the region. The seed producers at the regional level communicate to the regional BoA. Moreover, the regional BoA communicates the seed demand that cannot be met by the regional producers to the federal MoA. The MoA communicates the national level seed demand to federal level producers (public seed enterprise and private seed companies).

Once the seed sources and quantities are known, the MoA communicates to the regions the varieties and quantities of seed by source of seed. The seed availability and allocation of seed to zones and woredas is communicated by the regional BoA to zonal and woreda BoAs and cooperative unions which distribute seed. The seed producers also plan and communicate with cooperatives to sell seeds not channeled through BoA through direct seed marketing (DSM).

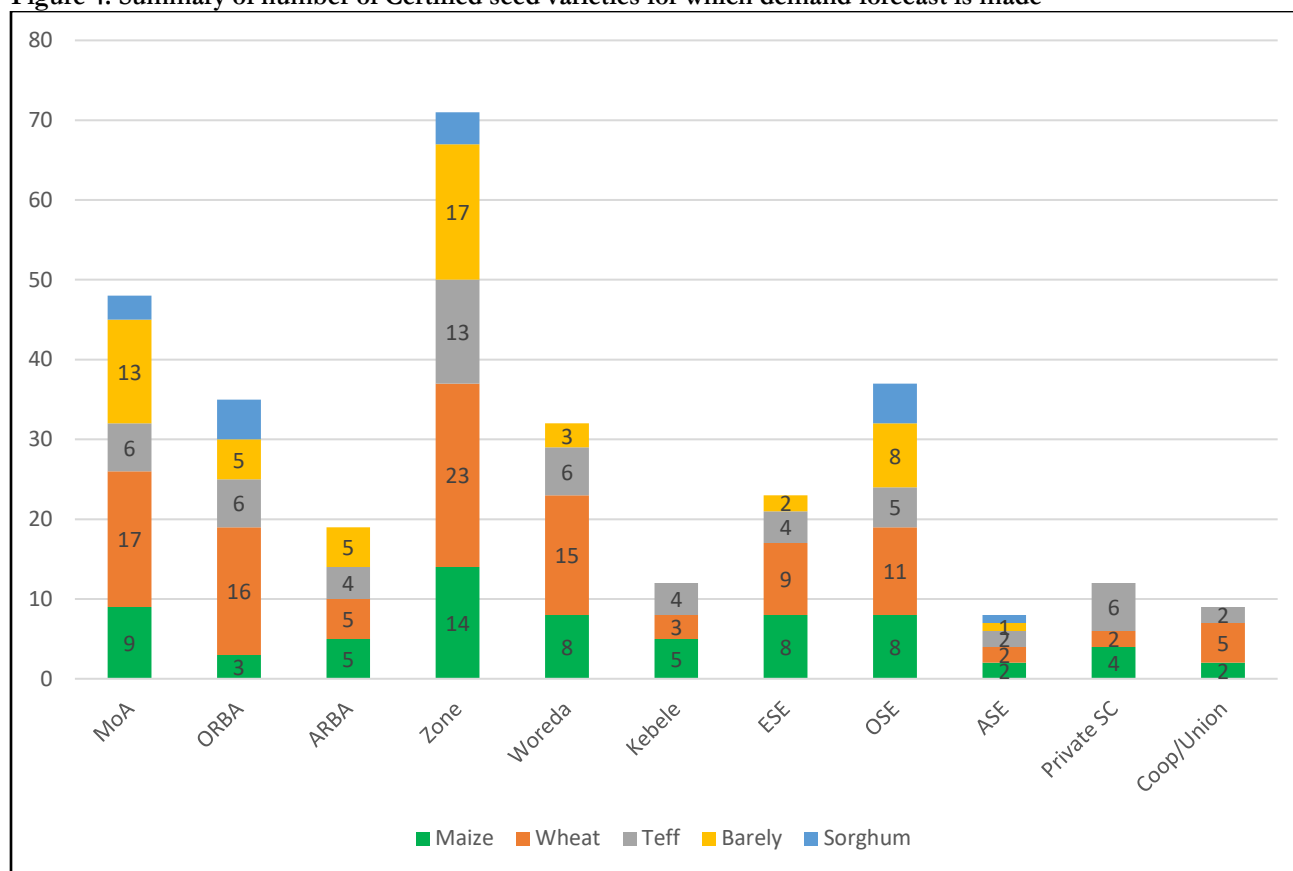
4.2 Crops and Varieties

Seed demand data is collected at different levels by the responsible stakeholders, although the number of varieties for which seed demand data was collected varies among the stakeholders. The key informants interview results reveal that the federal and regional research institutes were not engaged in certified seed demand forecasting as their role was mostly production of EGS. The numbers of varieties of each of the crops is summarized in **Figure 4**.

Findings reveal the number of varieties of each these crops increase from kebele through zone. Some varieties adapt well in the agroecology of a particular kebele. As the agroecology varies, the number of varieties for which data is collected becomes larger at woreda level. Similarly, the woredas under a given zone vary agroecologically. Thus, the aggregated number of varieties for which demand data was submitted to the zonal office was larger than the number of varieties reported at other levels. In addition to diversity in agroecology, the zones also receive a list of varieties from research centers in their area. In effect, the number of varieties the zone reported reflects the number of varieties in circulation.

During compilation and aggregation of the demand for certified varieties, the regional BoA checks availability of the demanded varieties. If the varieties are not supplied by the seed producers, the regional BoA advises the zones to plan for alternative varieties. Thus, the number of varieties of crops submitted by the zones to the regional BoA could be less than the number of varieties that the regional BoA aggregates as the demand. The varieties of each of the crops for which certified seed demand was forecasted at different levels are presented **Annex 5**.

Figure 4: Summary of number of Certified seed varieties for which demand forecast is made



4.3 Data & Methodology

As mentioned above, in this assessment, S34D collected the instruments that the administrative levels used. Many of those were in local vernacular, and S34D translated them into English (Annex 2).

Seed demanded and supplied depends on many factors. To understand better how these factors are incorporated in the current systemic process in Ethiopia, S34D collected information on key variables for which data and information were gathered by the administrators at each level (kebele, woreda etc.). Using a graded ranking from 0 to 4, S34D assessed which of the variables were always used (a score of 4) to never used (a score of 0). Figure 5 below shows the heat map summary of this analyses. In addition, S34D focused on assessing on whether gender disaggregated data was collected to discern crop-variety preferences of male and female farmers. Similarly, S34D used age as a variable to examine whether the administrative levels included age as a disaggregation to assess preferences of young entrepreneurs/ farmers.

As reflected in **Figure 5**, some variables are constantly used across all stakeholder groups and administrative levels. These include: area under cultivation, variety needed, quantity of seed, seed use trend, and volume of seed supply. However, seeding rate and seed replacement trends are not systemically used for the analyses throughout. Interestingly, even though farmer-saved seed plays an important role in determining the ultimate amount of seed demanded in each season, this important information is hardly collected. In the same vein, no data or information is collected for seed exchanges using informal channels (the informal seed system). In figure 5 'Not applicable' means that that data element is not perceived as applicable by the respective administrative boundary and/or the relevant institution. 'Nil' means that data is never collected for demand estimation purposes. The red color it to attract attention to those variables per stakeholders for which data is never collected for demand estimation purposes.

Figure 5: Mapping of variables for which certified seed demand data is collected at different administrative / stakeholder levels

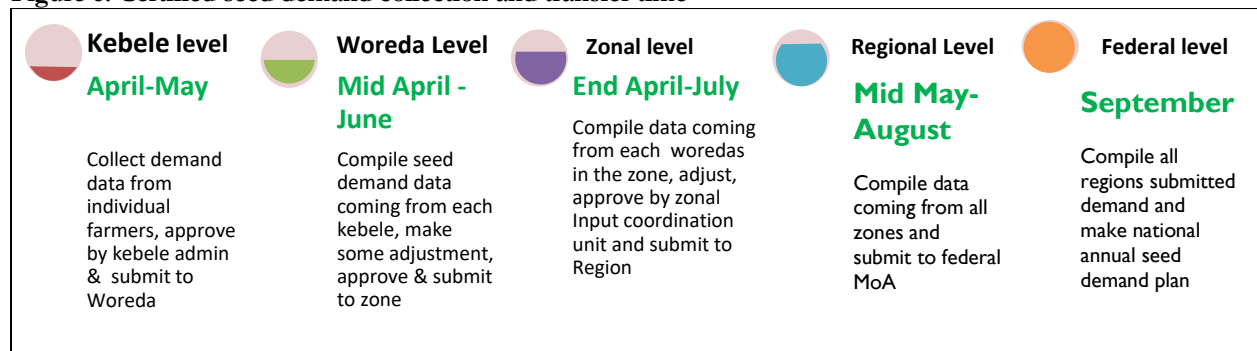
No.	Variable	Kebele	Woreda	Zone	RBoA	MoA	Public Seed Enterprise	Private Seed Company	Cooperative
1	Area under cultivation								
2	Seeding rate								
3	Variety needed								
4	Number of households growing the crop								
5	Quantity of seed needed								
6	Seed replacement trend								
7	Opportunity for varietal change								
8	Volume of seed supply, trend								
9	Volume of seed use trend								
10	Use of farm saved seeds								
11	Informal exchange of seeds and planting materials								
12	Number of men growing the crop								
13	Number of women growing the crop								
14	Number of male youth growing the crop								
15	Number of female youth growing the crop								
16	Market opportunity for seed								
17	Market opportunity for seed grain								
18	Others (type of soil & ecology in one kebele in Amhara)								
		N/A	Nil		Rarely	Sometimes	Often	Always	

Gender and age disaggregated data are not collected in most levels. This approach varies across woredas and regions. The biggest missing piece is information on market intelligence. This is a crucial missing piece in the process since any shifts in demand curves across years will not be possible to estimate as the factors that lead to such shifts are not taken into consideration.

The methodology used is simple aggregation with some data adjustments made based on past trends. It does not include any panel data analyses or any econometric modeling techniques. Therefore, shifts in demand cannot be estimated. Additionally, at kebele and woreda levels, the data is collected and stored on paper and often not digitized or archived. Therefore, any year-over-year analyses in a rigorous manner cannot be easily conducted. Overall, for the country, there is no centralized geo-spatialized data warehouse.

Figure 6 presents the timeline for the flow of certified seed demand data from the lowest (kebele) to the highest administrative level (federal MoA). Seed demand for the following production season is usually collected between April and May of each year at kebele level. If the kebeles submit their seed demand data, woreda level compilation starts mid-April of each year. The woredas compile the seed demand data and submit to the zone latest by June while the zones submit the compiled data to the regional BoA latest by July. The data is processed and evaluated at region level until the end of August and the federal MoA works on seed demand related issues in September each year. The data is used to plan seed distribution the following year.

Figure 6: Certified seed demand collection and transfer time



4.4 Price Setting and Seed Allocation / Distribution

Price setting

Price of the certified seed sold through the extension system is determined at a joint meeting of the four public seed enterprise (i.e., the Ethiopian Seed Enterprise, and Oromia Seed Enterprise, Amhara Seed Enterprise, and Southern Seed Enterprise) where the MoA and EIAR attend as observers. The price setting is assumed to consider cost incurred by seed enterprises and allow some margins. The presence of the MoA and EIAR could have indirect impacts on the outcomes of the meeting. The price set at the meeting should be approved by the MoA, which considers affordability and past price trends, as seed policy is an important political instrument in the country.

The approved price of certified seed is communicated to the regional BoA, public seed enterprises and research institutes. The regional BoA communicates the same price to zones and zones to woredas. This price serves as price at source of supply. The seed distributors add the costs of transportation, loading and unloading, and commissions on the price already fixed by the seed enterprises and approved by the MoA. This price is communicated to the BoA at different levels and the woreda agriculture office communicates the seed price to each kebele. In areas where direct seed marketing (DSM) is practiced, the seed suppliers determine the price at a level they feel competitive.

Seed allocation/distribution

Not all regions in Ethiopia have regional seed enterprises, but for those that have, the bulk of the certified seed supply comes from the regional seed enterprises. If there is a gap in a region for some crop-varieties, the gap is usually filled from the federal seed enterprise through allocation at the MoA level. The MoA organizes meetings with regional BoA and seed suppliers to agree on the mechanism of distributing seed to regions. Often, the amount of seed allocated is determined proportional to the request made.

The amount of seed allocated to regions is communicated to the regional BoA indicating the crop, variety, amount, and the supplier. The ESE distributes seed following the national allocation. If there is more supply than the allocated amount, the ESE finds a way to sell the seed itself.

The regions also allocate seed to the zones based on the demand estimated by each zone or proportional to their request when there is a gap between supply and demand. Likewise, the zones also allocate seed to the woredas.

The allocated seed is distributed through mainly unions and cooperatives which distribute the seed at the kebele level. The seed enterprises sell the seed to unions or use the unions as commission agents to sell seed.

Seed outside the allocated amount could be sold through the DSM mechanism where the seed producers sell seed through commission agents, who could be traders or cooperatives.

The assessment shows a lot of common features and processes in the seed demand forecasting in the Amhara and Oromia regions. Few differences were noticed between Amhara and Oromia:

- In Amhara, women farmers, if organized under some women groups, get priority during the seed distribution phase.
- In Oromia, some kebeles collect information on the informal seed sector (farmer-to-farmer exchanges).
- Oromia seed enterprise (OSE) roughly estimates the amount of self-pollinated crop varieties that might be saved by farmers for planting, but no detailed data is gathered.
- The seed production costs vary by public seed producers – for example, OSE has larger land holdings compared to ASE which uses a relatively greater number of out-grower schemes. Since the price-setting depends on the average cost of firms, those who do not have land and incur larger costs are affected. This is one of the major causes of disagreement between public and private seed producers in setting prices of improved seeds.
- OSE has a gender section that creates awareness for selected women farmers around the enterprise's farms. It also provides free inputs / seeds to pro-poor women farmers.
- Amhara seed enterprise (ASE) plan production at 120% of the demand to cope with rejections during inspections.
- Amhara RBoA requires 30% representation from women in agricultural activities.
- ASE collects information about farmers' willingness to pay for quality seeds of preferred varieties.
- Oromia RBoA developed and implemented procedures to be followed during seed distribution.

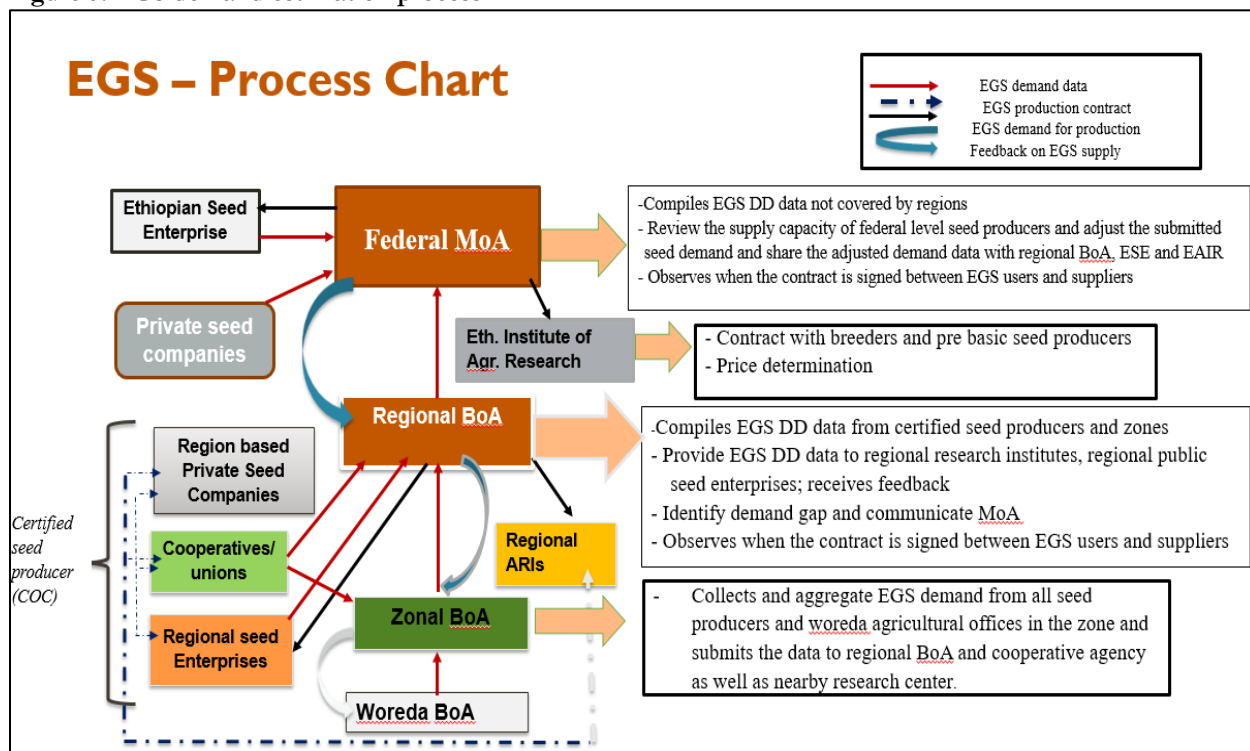
5. Assessment of EGS Demand Forecasting

This section presents the process of EGS demand forecasting, and the roles and responsibilities of the stakeholders involved. The type of data collection, methods of data collection, analysis, and level of aggregation have been presented here. The overview of the EGS forecasting process at system level has been schematically presented in section 5.1 while details of schematic representation of the process for each of the stakeholders have been presented in **Annex 6**.

5.1 Roles and Responsibilities

Figure 7 schematically illustrates the EGS demand forecasting process currently in Ethiopia. Annex 5 shows the details of EGS forecasting processes at each administrative level. It is to be noted that the stakeholders involved in EGS production are primarily the research institutes and public seed enterprises.

Figure 7: EGS demand estimation process



In most cases the EGS producers determine the demand of EGS based on the demand for certified seed. There is no EGS demand estimation at kebele level. The role of the stakeholders involved in EGS demand estimation is explained as follows:

- i. **Woreda agriculture office:** The woreda agriculture office collects EGS demand data from seed producer cooperatives in the woreda. It compiles demand data, aggregates the demand data by crop, variety and seed producers and then shares the demand data with the zonal and the regional BoA as well as the Cooperative Promotion Agency.
- ii. **Zonal agriculture office:** In the case of EGS, the demand estimation is limited to only seed producer cooperatives and unions and hence the collection is also limited. If the seed producer cooperative and union does have a certificate of competence for seed production, the demand of EGS by such a cooperative and union is collected, compiled, and submitted to the regional BoA and Cooperative Agency. If woredas compile and submit EGS demand data, then the zone compiles the data collected

from seed producer cooperatives and unions organized at the zone level and submits it to the regional BoA and the Cooperative Agency for distribution.

- iii. Regional BoA: The bureau formats seed demand data. The same format aims at collecting demand data by crop, variety, seed class and quantity of seed needed. Thus, the EGS demand data is collected along the certified seed from zones, certified seed producers in the region including public seed enterprise, private seed enterprises, cooperatives, and unions. The data are collected at different levels: woreda, zone and region where the seed producers submit their demand for EGS to the respective stakeholder. The regional BoA compiles the EGS demand data by crop, variety and seed producers and informs the EGS producers and the regional Cooperative Agency. It also specifies the gap in EGS demand and requests the MoA to fill the gap through national allocation of EGS.
- iv. Federal MoA: The MoA compiles the EGS collected from regional BoA and ESE. It analyzes the capacity of EGS suppliers at the federal level. It provides the EGS demand data to the regional BoA, EIAR and ESE/EABC. It also facilitates contractual arrangement between EGS seed producers and certified seed producers, who have demanded the EGS.
- v. Public seed enterprises: The regional seed enterprises receive the demand for EGS from the regional BoA while the federal seed enterprise gets the demand for EGS from the MoA. Then, the seed enterprises consider the demand for certified seed, past years' trends, availability of breeder and pre-basic seed (collected from research institute) to estimate the demand for EGS.
- vi. Private seed companies: Private seed companies get the demand from seed producer cooperatives that work with the companies. The companies determine the amount of EGS demanded based on the quantity of certified seed demanded, discussed under section 4.1 above, and historical performance trend.
- vii. Cooperatives/unions: The demand data is collected from members of the seed producer cooperatives/unions. Unions determine the EGS demanded based on the demand for certified seeds and prior information about supply of EGS and past trend of EGS use.
- viii. Research institute: The research institutes receive the EGS demand data from the MoA and regional BoA. To a limited extent, it collects data from seed producers (farmers and cooperatives) through EGS planning workshops (mainly done by IQQO). Then, institutes compile the EGS demand data and analyze it by seed class. Eventual supply of EGS is based on past performance and capacity of the institute. The research institutes communicate the quantity of EGS they can supply to the Regional BoA, MoA, and ESE specifying the crop, variety and volume of EGS that could be supplied. Then, each research institute provides the EGS demand data to its research centers to pursue the seed production.

The assessment revealed that there is no clear link between EGS and certified seed demand forecasting. This is because demand for EGS and certified seed is collected using the same data collection format in which crop type, variety, and seed class are specified to collect the quantity of EGS and certified seed demanded. Hence, the timeline for collecting and communicating EGS demand data exactly overlaps with that of the certified seed (specified in Figure 6). The EGS demand depends on the amount EGS needed for production of certified seed during the following production season. On the other hand, the certified seed demand collected this year, informs certified seed for grain production during the following season. This implies a huge gap or mismatch between seed demand forecasting and seed use.

Table 5.1: Role of key stakeholders in EGS demand forecasting

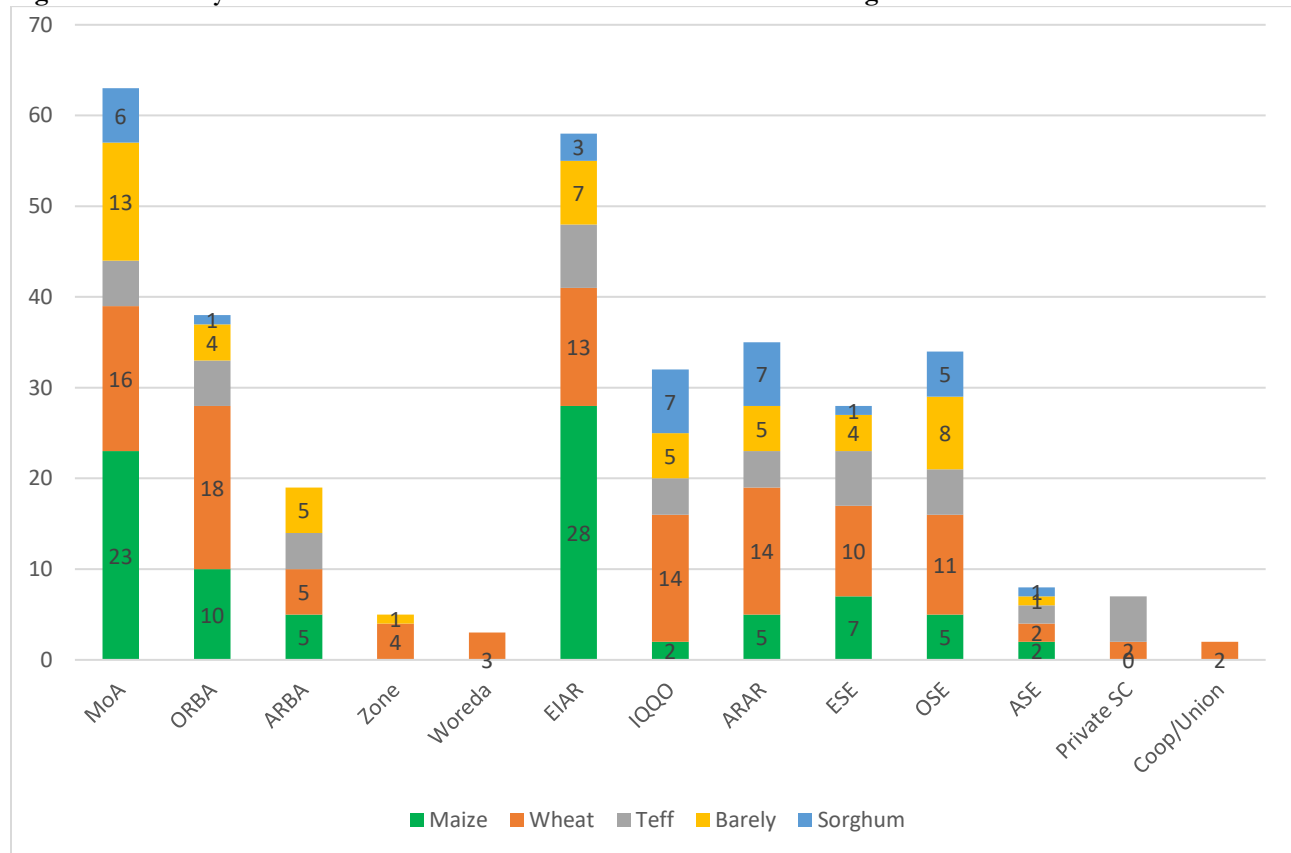
Role	Woreda	Zone	RBOA	MoA	PSE*	PSC*	Coop	ARI*
Use format prepared by -- for data collection			Prepare EGS data collection format and share with seed producers					
Collect data from...	Collect EGS demand data from certified seed producer cooperatives	Data collected by woreda BoA; collect data from cooperative union registered and operate at zone level	Collect EGS demand data from zonal BoA, or/and seed producers (private seed companies, public seed enterprises, cooperative unions); EGS demand may also come from other regions	Receives EGS demand data from RBOA, PSE and PSC,	EGS demand is collected through RBOA and MoA. PSE plan for EGS supply based the data.	Demand data collected from producer cooperatives and clustered farmers (groups) producing certified seed as out growers	Demand collected from its seed producing members; Information on demand is also communicated to coops by BoA/MoA to plan seed production planning	Demand estimated by RBOA and MOA is used by ARI for planning EGS production; Limited cases of collecting data from farmers and coops
Compile data	Aggregate the data by crop, variety, and coops	Aggregate data by crop, variety	Aggregate the EGS demand by crop, variety by certified seed producers; Shows the gaps to be filled at the federal level	Compile the EGS data, analyze the capacity of EGS suppliers at federal level and make adjustments. Aggregated by region, crop type and variety.	PSE makes no aggregation but bases its plan for EGS supply on demand for certified seed, past years' trend, availability of breeder and pre-basic seed.	Data used for own planning based on resources availability	Compiles by crop and variety	Compiles data by crop and variety and considers past trend to adjust the plan based on its capacity
Submit data to other stakeholders	Zonal Agr Office and regional BoA and cooperative agency	Regional BoA and cooperative agency	Data reported to seed producers in the region, coop agency, MoA (to fill regional EGS gaps)	Share the revised EGS demand with RBOA, EIAR and ESE/EABC		Communicate the BoA, inform out-growers about the plan to prepare land for seed production	Zonal or regional BoA	Communicate its EGS production capacity to RBOA, MOA and ESE
Coordination		Follow up the actions taken	Coordinate the EGS demand collection in collaboration with ARI	Facilitate contract signing between EGS suppliers and seed producers				

* PSE= Public Seed Enterprise; PSC= Private Seed Company; ARI= Agricultural Research Institute

5.2 Crops and Varieties

The demand for EGS is forecasted by the certified seed producers and EGS suppliers. The regional BoAs communicate the EGS demand to MoA and regional agricultural research institutes. The demand for EGS is consolidated at the MoA level and communicated to the Ethiopian Agricultural Research Institute (EIAR). As shown in **Figure 8**, MoA, EIAR, Oromia RBoA, Amhara RBoA, IQQO, ARARI, OSE and ESE are involved in EGS demand forecasting for larger number of varieties of the different crops. The varieties of each of the crops for which demand forecasting was made is given in **Annex 7**.

Figure 8: Summary of number of EGS varieties for which demand forecasting is made



5.3 Data & Methodology

The data collection methodology for EGS is like that of certified seed demand forecasting. The format used for data collection is also similar for both seed types including crop type, variety and seed class and the quantity of EGS and certified seed demanded during the next production season. Hence, the schedule for seed demand collection and communication overlaps for EGS and certified seed. **Figure 9** maps the type of data collected at different administrative levels and stakeholders.

Figure 9: Mapping of variables for which EGS data is collected at different stakeholder and administrative levels

No.	Variable	Woreda	Zone	RBoA	MoA	Public Seed Enterprise	Private Seed Comp
1	Area under cultivation						
2	Seeding rate						
3	Variety needed						
4	Number of households growing the crop						
5	Quantity of seed needed						
6	Seed replacement trend						
7	Opportunity for varietal change						
8	Volume of seed supply, trend						
9	Volume of seed use trend						
10	Use of farm saved seeds						
11	Informal exchange of seeds and planting materials						
12	Number of men growing the crop						
13	Number of women growing the crop						
14	Number of male youth growing the crop						
15	Number of female youth growing the crop						
16	Market opportunity for seed						
17	Market opportunity for seed grain						
		NA	Nil	Rarely	Sometimes	Often	Always

There are only a few variables that play a role in EGS demand estimation across all administrative levels: area under cultivation, seeding rate, and variety needed. Although the number of men and women farmers growing the crops is gathered at the woreda level, it is not used as one goes further up in the administrative levels. Seed replacement trend is not taken into consideration at any level. Volume of seed supply trend and seed use trend is systematically gathered in higher administrative levels. Surprisingly, information on opportunities for any varietal change is not recorded at any administrative level.

5.4 Price setting and seed allocation / distribution

The basic seed producers especially the four public seed enterprises set the price of certified seed by taking their costs into account. As stated earlier, the MoA and the agricultural research institutes observe the seed price setting and finally, the MoA approves the price.

The price of EGS depends on the price of certified seed where EGS price is 10-20% more on the certified seed price.

6. Awareness Creation

Awareness creation enables seed users to know the type of seed available, who supplies the seeds and where the seeds are available, and which then creates demand. Awareness creation is done by different stakeholders and administrative levels and there is remarkable difference between the awareness creation instruments used at different levels (**Annex 8**). The stakeholders in the seed value chain play different roles to create awareness of new varieties of crops and stimulate adoption. The first major promoter of new varieties is the agricultural research institute which releases the variety. The stakeholders are made aware of the new variety during the assessment of on farm trials of the new varieties in different areas. The national variety release committee, composed of different stakeholders (including those covered in this study), evaluate and approve the release. The released variety is demonstrated on plots in different areas and publicized in mass media. The demonstration sites are visited by farmers and different seed sector stakeholders during field days.

The results of the interviews show that awareness creation forums are mostly organized at kebele and woreda levels, while the public seed enterprises and private seed companies always participate in promotional events and co-organize the events. Moreover, public seed companies always promote varieties through mass media and field days. Demonstration of new varieties at farmer training centers (FTCs) or farmers' plots, and field days are the two most common awareness creation activities conducted by kebele, woreda and zone level stakeholders. For the varieties known for their merits such as high yield, drought, and disease resistance, the MoA also organizes national field days (on selected demonstration areas in selected regions) and promotes the importance of the use of improved seed through mass media.

Regional BoA organize training of trainers for zonal and woreda experts on variety demonstrations, motivate variety releasing institutes to demonstrate new varieties and participate in field days and evaluation of demonstrations.

Promotional activities specific to women and youth are done only infrequently at kebele and woreda levels and never by the other stakeholders. Seed promotion activities have never been designed for people with disabilities. The Extension Directorate of the MoA creates awareness for women on mass media. Regions do not have specific strategy for women and youth extension except that female headed households are encouraged to participate in agricultural activities.

Awareness creation using technologies such as SMS, WhatsApp groups and websites are rarely practiced by research institutes and universities and never practiced by the other stakeholders included in this study.

In general, the promotional designs such as demonstration-based awareness raising are not especially targeted to include women farmers or young farmers. So, in some sense, the process is not very inclusive. A more inclusive approach should include platforms that provides opportunities for different household members (male, female and youth farmers).

7. Strengths and Weaknesses

The strengths and weaknesses of the seed demand forecasting in the seed sector were assessed at different levels. The strengths are categorized into (i) capacity to assess seed demand, (ii) infrastructure and use of digital technologies for seed demand forecasting, (iii) seed production, (iv) seed distribution, (v) seed price determination, (vi) role of institutional buyers, (vii) role of informal seed actors, (viii) role of market, (ix) role of agricultural research institutes, and (x) knowledge dissemination and capacity building for male and female farmers and those with disabilities. Attention was given to kebele, woreda and zonal level stakeholders to address the above categories of capacity. The capacity for seed demand assessment was given emphasis at higher levels of the system. The following sub-sections present the responses of the key informants at different levels in the seed value chain separately for strength and weakness.

7.1 Strengths

- i. *Capacity to assess seed demand:* The seed demand assessment follows a bottom-up approach. Thus, the initial data to estimate seed demand originates from farmers through data collection at kebele level. Wider coverage of the seed demand assessment as a system is viewed at all levels as a strength. In the process, the administration higher in the hierarchy provides training or awareness raising and technical support on seed demand assessment to the lower levels. Accordingly, the federal MoA provides training and technical support to RBoAs, which in turn trains and provides technical support to the zones and sometimes also trains woreda experts with zonal experts. The woredas train DAs and provide technical support to the DAs and the kebele level team.

Information exchange during seed demand assessment is high. The respondents stated that MoA and RBoA have accumulated rich experiences and skills to make seed demand collection from lower levels, make adjustments and share the information to responsible institutions such as research institutes and seed enterprises (related to EGS) and regions, cooperatives, and seed enterprises (related to certified seed). The seed demand submitted to higher bodies is checked through different means such as relating to past trend or direct interview in selected areas or crops. As a system, this ensures relevance and good planning.

Public seed enterprises and private seed companies collect feedback on seed demand during field days to understand farmer preferences and align their production plan with that of the demand forecasted by the regional BoA and MoA.

Seed producer cooperatives and cooperative unions collaborate with zonal cooperative promotion agencies and RBoA to receive seed demand data. They also make their own assessments in terms of the seed demanded in their areas.

- ii. *Infrastructure and use of digital technologies for seed demand forecasting:* The major technology mentioned for seed demand assessment was the availability of computers and the ability to use them. The ability to use computer and digitalize data declines down the level in the seed value chain, being the least at kebele level. Though data collection has not been digitalized, availability of computers and its use for data analysis and data storage is less serious at higher levels specially at zone, regional BoA and MoA.
- iii. *Seed production:* There is good capacity for seed production. As mentioned by the key informants at kebele, woreda and zonal levels, there is suitable land to produce seed. There are several able seed producer cooperatives that are engaged in seed production. The DAs and woreda experts provide technical support to farmers who produce seed in clusters. These farmers serve as out-growers for cooperatives/unions or seed companies or public seed enterprises. Public seed enterprises also use their own land for seed production (certified and EGS) at different locations, which enables them to supply diverse seed varieties suitable for different agroecologies. The capacity for seed production is growing. Public seed enterprises

use mechanized system. The government has also eased the challenges of accessing farm machinery, creating a supportive enabling environment for crop and seed production. At zone level, input quarantine and quality agencies support seed producers in ensuring seed quality by providing inspection and seed quality testing services.

- iv. *Seed distribution:* The major strength in the seed distribution stated at kebele, woreda and zone level is the existence of different seed distributing agents providing alternatives for buyers. The direct seed marketing channel also provides alternatives for farmers. The woreda agriculture office coordinates and supervises the seed distribution system to ensure proper distribution and resolve issues associated with it.
- v. *Seed price determination:* The seed price setting is based on cost of production. However, this is known to the stakeholders at higher levels, not, for example, at kebele level. The price information is also shared to distributors immediately after it is determined. However, there were complaints that the transmission of price information to kebele level is done late. Existence of competitive prices, e.g. for hybrid maize seed and QDS, is considered a strength of the pricing system.
- vi. *Role of institutional buyers:* The role of institutions in seed buying is related to capacity building for farmers (who fall short of seed) or provision of EGS for seed producer groups or cooperatives. It's also stated that NGOs purchase seed when the seed supply in a given area is in excess; again, to distribute to other farmers and ensure that the farmers earn sufficient income from the seed business. The role of the government in seed purchasing is reduced to a large extent.
- vii. *Role of informal seed actors:* The informal seed sector is the major source of seed for many grain producers. It addresses many orphan crops (not addressed by the formal seed system), reaches remote and vast agroecological zones and is a means to maintain the endogenous knowledge, skill, and land races. The informal system can also be a means to inject a new variety into the production system, but this is rare.
- viii. *Role of market:* The open market, where farmers purchase seed, provides alternatives for accessing seed. However, such markets are places where informal seeds are purchased or sold. For improved seeds, DSM is a new window for marketing seed in local areas.
- ix. *Role of agricultural research institutes:* Agricultural research institutes provide starter seed for farmers as well as supervision and technical support to selected farmers for demonstration purposes. Seed producer cooperatives closely work with research institutes. It is a means for verifying new varieties in a given geographic location.
- x. *Knowledge dissemination and capacity building for male and female farmers and those with disabilities:* Knowledge dissemination to farmers is made mostly at FTCs (Farmers Training Centers) by DAs through demonstration of new agricultural production technologies and practices. The knowledge transfer is made to all farmer groups (no distinction is made between men and women and farmers with disabilities). It is also indicated that the number of women who are getting extension services is increasing.

The major strengths of the seed demand forecasting systems are different administrative levels, as seen in **Annex 9**.

7.2 Weaknesses

- i. *Capacity to assess seed demand:* The major weakness, in terms of capacity, mentioned at different levels in the regions, is related to the inability to collect accurate seed demand data as shown by the mismatch between seed demand and supply. As stated above, the system allows a bottom-up approach to seed demand data

collection. Some farmers are also reluctant to submit their seed demand resulting in inaccurate seed demand. It has also been mentioned that there is no mechanism for verifying data and checking accuracy. The situation worsens for EGS.

Besides poor capacity, DAs often lack motivation and have no incentives to perform their tasks properly. There is a high degree of doubt on the accuracy of demand collected by DAs. Old varieties are in demand year in and year out, indicating that newly released crop varieties are not properly disseminated, promoted, or popularized. There is no updating of seed demand close to the planting time so changes in farmers' preference are not considered, resulting in a mismatch between demand and supply.

- ii. Infrastructure and use of digital technologies for seed demand forecasting: The major weakness in terms of capacity mentioned at different levels in the regions is related to a lack of a digitalized system for seed demand data collection including ICT for seed demand data collection planning, data collection, storage, and sharing with relevant stakeholders. Lack of computers and inability to use them is worse at the kebele level, where the primary data for seed demand forecasting is generated. At the woreda level, (more than the computer itself) the lack of technical capacity and tools for seed demand data collection and analysis have been indicated as major weaknesses.
- iii. Seed production: The major weakness mentioned by the key informants at kebele, woreda and zonal level include inadequacy of EGS for the production of certified seed, mismatch between demand and supply (low production), low capacity of seed producers (technical skill, mechanization, access to irrigation facilities), and low capacity of the seed quality assuring agencies. There are also mismatches between the varieties demanded and the varieties produced.
- iv. Seed distribution: The major limitation in the seed distribution is a lack of appropriate distribution mechanisms known to all different actors in the seed distribution system. The coordination of the distribution is also viewed as inefficient which sometimes resulted in late distribution of seed relative to the planting time. The number of varieties distributed does not match the demand. It is also indicated that the seed distribution inefficiency is related to poor capacity of seed distributors. DSM is also practiced only for maize and wheat.
- v. Seed price determination: The seed price determination mechanism is not transparent, how the price is set is not known to the seed buyers or seed distributors at lower levels. Therefore, as the price of seed increases over time, farmers complain about it. Some also consider the price "unfair". It is not communicated in a timely manner to the kebele level.
- vi. Role of institutional buyers: NGOs buy seed only sometimes and hence do not provide sustainable mechanisms for seed distribution. These actors cooperate more at woreda level BoA than at higher levels.
- vii. Role of informal seed actors: The major weaknesses are lack of quality standard, lack of accountability, and no documentation or information for follow up. Many farmers use their own seed from past production- which falls into the informal category. However, the farmers are not aware of adequate varietal replacement periods to produce optimum yield.
- viii. Role of the market: The major limitation is lack of distinction between seed and grain market. The market is also not subject to quality clearance. The market is also not developed with infrastructure, including storage facilities and market information.

- ix. Role of agricultural research institutes: Research institutes provide only limited EGS compared to the demand. There is also low coordination between the research and woreda agriculture offices.
- x. Knowledge dissemination and capacity building for male and female farmers and those with disabilities: There is a lack of knowledge dissemination strategies targeting female and disabled farmers. For every group of farmers, capacity building training is given for a large group of farmers, making the knowledge dissemination ineffective.

The major weakness of the seed demand forecasting systems separated by different administrative levels is given in **Annex 10**.

8. Key Findings and Recommendations

The goal of the present study was to assess the system and processes currently used in Ethiopia to forecast certified seed and EGS demand. Results indicate that system improvements are needed to further improve the processes. There are formats and trainings provided from zonal to woreda to kebele levels to gather the data necessary for forecasting demands of seed varieties. However, there are inconsistencies across woredas and kebeles regarding the granularity of the information collected and how that is utilized for the forecasting process moving up the administrative levels. For example, the numbers of female and male farmers demanding a certain crop variety, is collected at the lower administrative levels, but not at zonal or regional levels.

Also, at the lower administrative levels, paper formats are used to gather information, curate the data, and report the result. At the woreda level, kebele level data is aggregated and further adjusted. Aggregation is done on paper and shared with zonal BoA. No digitations efforts are possible nor is there any reliable internet connection available at the kebele and woreda levels. Past trends are used to adjust the final data for submission to the higher administrative level. At the zonal level, woreda data and data collected from cooperatives at zonal level are aggregated, approved by the zonal ICU and submitted to the RBoAs. Aggregation is done on computers. RBoA receive the aggregated demand data from zones by email, and hard copies. Regional development plans and past trends are used for adjusting the demand. The disaggregation levels are by crop/variety/volume. Many times, gender is used as a dimension. However, age is never used. At the national level, seed demand is aggregated by crop/variety/volume.

Going forward, S34D recommends moving from paper to digital data collection, curation, recording, and communication – if this was done, a year-over-year panel structure could be created. Similarly, on the methodology aspect, simple aggregation and adjustment based on past trends could be augmented with panel data estimation using econometric models which will account for both movements along the demand curve, as well as shifts in the curve due to shocks, stress or other exogenous factors. This necessitates data collection for key variables which are currently missing from the system, as well as incorporating both micro-level (household) information from the Central Statistical Agency (CSA) and using big-data – such as weather, information from satellites etc. Additionally, given the big role that the informal seed system plays in Ethiopia, S34D recommends gathering information on seeds saved and exchanged through informal channels.

Aligned to this methodological aspect, is the need to develop a digital database / digital library that is archived, centralized and accessible to relevant stakeholders. Such a database will need to be augmented every agricultural season – at the very least. This database could also help foster transparency through effective communication and dissemination of relevant information generated from the data.

To do this, S34D recommends investing in gathering key data points on markets – an example being: seed-grain price ratio. Private seed companies use their own sales data (current and previous years' trend) to forecast seed demand for certified seeds. They then adjust it based on other factors – competitors' market share, availability of basic seed, willingness of the out-growers to provide land etc. S34D recommends forming public-private partnerships to double-down on generating critical market information that will be beneficial for all stakeholders. Some woreda BoAs consult NGOs in estimating demand for certified seeds. NGOs provide market information. However, NGOs lack transparency and documentation during purchases. Another approach would be to coordinate and collaborate with key NGOs in Ethiopia.

Currently, the forecast is made at crop-variety levels, irrespective of the competitive advantage that crop-variety has in market. Furthermore, the price is set at a national level in consultation with few stakeholders. If Ethiopia would like to liberalize its seed sector, then price setting mechanisms need to be significantly revised.

One question to answer from the start is: “Does price need to be set for all crop-variety combinations?” Maybe for the crops that face competition, free markets could determine the price of its seeds. Similarly, engaging private sector stakeholders is key for any kind of liberalization efforts. Thus, excluding private entities from discussions on price setting is not conducive for liberalization in the long run. If Plant Breeders Rights (PBR) are going to be in effect with an aim for breeders to receive royalties, then price setting behavior by the government needs to be relaxed. A phased approach for that could be an option – by region, crop-seed variety etc. Aligned with the DSM approach, one might want to segment kebeles and woredas that reflect greater market competitiveness than others. For those competitive regions, perhaps the Ethiopian government could let market forces determine equilibrium quantity and price for seeds.

Understanding different segments of the market is key to match supply and demand. At present, disaggregated data for gender and youth is neither systematically collected nor controlled for while estimating demand at a variety level. To target markets better, it is key to assess preferences of different customers. Going forward, S34D recommends gathering gender and age disaggregated data throughout the process and make it inclusive – leveraging some of the gender specific initiatives already being implemented at the regional level (see Section 4.4). Similarly, establishing digital feedback mechanisms to assess varietal performance and preference is important to generate real-time market information in a geospatially disaggregated fashion. Overall, this can help with generating awareness of new varieties, and developing marketing strategies for seed producers and distributors (both public and private entities).

Seed producer cooperatives and unions play a crucial role in the Ethiopian seed sector. Going forward, S34D recommends exploring pilots whereby these actors could participate and play a role in helping augment the current forecasting processes in place. For example, Hetosa Union has initiated efforts to estimate demand for certified seed. Capacity building from the grassroots level to higher administrative levels is key – especially on new technologies and methods. Key stakeholder participation and willingness to modernize the processes is key. The stakeholder validation workshop conducted by S34D in May 2021 (see **Annex 11**) confirms their positive acceptance.

As reflected in sections 4.1 and 5.1, there is a significant amount of communication that takes place to relay the information on seed supply, seed demand, and gaps thereof. Multiple parties and channels are simultaneously used to deliver the same information at different administrative levels. Thus, there is a high probability of encountering mixed messages or even misinformation, or information after the appropriate time has lapsed. Therefore, S34D recommends streamlining communication channels so all stakeholders could be apprised of the correct information at the right time. A centralized data source and digital library would be a first step towards that. But establishing transparent communication platforms is also encouraged.

Box-1 below provides a summary of the near-term actions that S34D could initiate in collaboration with national and international stakeholders active on the grounds in Ethiopia.

Box-1: Recommendations for the technical road map to modernize the forecasting system and process⁴

- Move from paper to digital data collection at all administrative levels.
- Build technical capacity especially at grassroots levels.
- Collect age and sex disaggregated data to assess preferences of women and youth.
- Collect and share good quality, near real-time, information on the seed-grain price ratio to increase market transparency.
- Improve the methodology of forecasting (use econometrics to do predictive modeling; big data and micro-level information; near real-time forecasts etc.). Capture shifts in demand.
- Initiate data coordination nodes to exchange both micro and macro level data necessary to support econometric models (in collaboration with the CSA, ATA, MoA, World Bank, and groups that deal with statistics from space, weather data etc.).
- Put a centralized database in place to increase transparency and strengthen documentation, which also enables online tracking.
- Establish a digital library with data archives across space and time.
- The current price setting strategy needs to be re-visited if the country wishes to liberalize the seed sector. As a first step, it can factor in seed quality while setting prices. Seed pricing mechanisms should also be checked with grain prices.
- Create awareness and develop marketing strategies (for both new and existing varieties which have a huge market pull), farmer segmentation models, WTP approaches, and constructive feedback mechanisms.
- Increase transparency in seed demand, forecasting, price setting, and seed distribution.
- Provide feedback to the farmers regarding the response (if they get the demanded seed) until the seed distribution time. Lack of feedback to the farmers on the status is discouraging them from registering their demand in the future.
- There should be standardized and well-documented adjustments of data at all levels.
- Pilot approaches and case studies with unions who are showing interest in seed demand forecasting (example: Hetosa Unions).
- The EGS forecasting process should be standardized along regions and within regions. Applying uniform approaches and transparency in the process is needed.
- Finalize EGS demand forecasting and the decision for its production period no later than the end of February each year.

⁴ S34D conducted a stakeholder validation workshop to discuss findings, validate recommendations and approach etc. The recommendations listed here were validated by national, regional, and local stakeholders. Refer to Part B of the report for additional details.

9. Concluding Remarks

Seed demand forecasting is a function of many variables including infrastructure and institutional factors. As such, all major stakeholders have a role to play in it. Avoiding or excluding some is not beneficial for the long run. Ethiopia has a process in place (unlike many countries in sub-Saharan Africa) that is already a promising start. However, to be successful, the process needs to be modernized through digital approaches and rigorous forecasting methodologies that incorporate both micro-level and big-data structures.

Realized demand is a function of the price. Currently, prices are set. This price is set in consultation with only the public seed enterprises. Going forward, as markets become more competitive and the use of DSM approaches reach scale, Ethiopia could adopt a phased approach to withdraw price ceilings. This will be a policy change, and with any other policy shift, there might be winners and losers. Therefore, it is essential that the government coordinates and conducts dialogues with stakeholders from across both private and public entities to determine the path forward.

Awareness creation on crop varieties enables demand creation. The major platforms for awareness creation are demonstration plots and the use of media. Seed producers use mass media more than the other stakeholders. Awareness creation is conducted by different stakeholders and administrative levels and there are remarkable differences between the awareness creation instruments used at different levels. Plot level demonstration and field days are the two widely used means of promoting varieties. However, participation of women and youth is limited. Interesting though, is the participation of different stakeholders in similar awareness creation forums, which is important for shared and participatory role in varietal improvement (research) and planning for appropriate seed supply (seed producers). Going forward, in collaboration with CGIAR centers, public, and private entities, Ethiopia could think of cost-sharing approaches to create awareness and generate demand for new varieties. Use of digital media should be incorporated in the process.

The existence of organizational structure embedding crops and inputs at different levels and the availability of staff for seed demand data collection are some of the strong assets for strengthening the system. The MoA and RBoA have accumulated rich experiences and skill to make seed demand collection from lower levels, make adjustments and share the information to responsible institutions such as research institutes and seed enterprises (related to EGS) and regions, cooperatives, and seed enterprises (related to certified seed). This implies that the federal MoA and regional BoA could serve as a hub for centralized seed data system management in the country. The major limitation regarding staffing is an inadequate supply of qualified and technical staff, especially at lower administrative levels of the country.

Currently there exists positive momentum for strengthening and modernizing the seed demand forecasting process. There is abundant talent and capacity within the country to match the requirements. However, often this talent is not uniformly spread across the country or administrative levels. Mobilizing technical capacity and resources to initiate this change is a must.

Finally, it is only possible to modernize the system through partnerships – this is not a “one-project” or “one-stakeholder” shift. This encompasses multiple groups, stakeholders, administration levels, geographies, crop-varieties, etc. Thus, going forward, Ethiopia could initiate a representative working group to pilot the recommendations laid out in this assessment.

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Annexes

Annex 1: List of Persons Contacted and their Description.

48 people were contacted for this work at the federal, regional and zonal level.

At federal level, four persons from MoA, EIAR, public and private seed enterprise were contacted (4).

At the regional level, eleven participants were from the Amhara and Oromia Agricultural Research Institute, Amhara and Oromia Regional Bureau of Agriculture, public and private seed enterprises and cooperative unions (12).

At the agriculture zonal and woreda office, 20 people from West Gojjam, 8 from Arsi and 4 from West Shewa were contacted (32).

No.	Region	Zone	Institute	Instrument	Name	Sex	Position	Contact:	
								Phone	email
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No.	Region	Zone	Institute	Instrument	Name	Sex	Position	Contact:	
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41	████		████████	████████	██████████	█	██████████	████████	████████████████████
42	████		██████████	████████	██████████	█	██████████	████████	████████████████████
43	████		████████	████████	██████████	█	██████████	████████	████████████████████
44	████		████████████████████	████████	██████████	█	██████████	████████	████████████████████
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47	████		████████████████████	████████	██████████	█	██████████	████████	████████████████████
48	████		██████████	████████	██████████	█	██████████	████████	████████████████████

Annex 2: Instruments Used for Data Collection

Annex 2.1: Instruments for MoA and Regional BoAs

Date: _____

Details of the key informants:

No.	Name	Sex	Job Title	# of years of service	Contact:	
					Phone	email

Section A. Seed Demand Forecasting Method

1. Please explain the role of the federal MoA in seed demand forecasting considering the following issues:

Issues	EGS	Certified	QDS	Others seed
1.1 What roles does the MoA play in seed demand forecasting? <ul style="list-style-type: none"> • Collect seed demand data • Aggregate seed demand data of the regions • Coordinate seed demand forecasting • Others (specify) 				
1.2 How does the MoA play this role? What do you start with? Explain the steps in the methodology used for seed forecasting.				
1.3 How do you get seed demand data (digital, paper)?				
1.4 From whom do you collect the seed demand data? (probe for women-only/ youth organizations) <ul style="list-style-type: none"> • National past trend • National development plan • Regional seed demand forecast 				
1.5 With what frequency do you collect the data: <ul style="list-style-type: none"> • Once in belg, • Once in meher, • Quarterly • Once in a year • Other (please specify) 				

Issues	EGS	Certified	QDS	Others seed
1.6 What do you project from the seed demand forecasting? What is the end product of the seed demand forecasting? Please specify the key metrics				
1.7 At what level do you forecast seed demand? <ul style="list-style-type: none"> • By crop by variety (national) • By crop by variety for each region • Other (specify) 				
1.6 How do you use the forecasted seed demand?				
1.7 What is the seed demand forecasting horizon? For how many years ahead do you forecast the seed?				

2. Which of the following metrics and/or points are largely considered while you collect data for seed demand forecasting? (Always; Less than often; Never; Not applicable)

Variable	EGS	Certified	QDS	Others seed
2.1 Area under cultivation				
2.2 Seeding rate				
2.3 Variety needed				
2.4 Quantity of seed needed				
2.5 Seed replacement trend				
2.6 Opportunity for varietal change				
2.7 Volume of seed supply				
2.8 Volume of seed use trend				
2.9 Volume of seed left over from previous year				
2.10 Number of men growing the crop				
2.11 Number of women growing the crop				
2.12 Number of male youth growing the crop				
2.13 Number of female youth growing the crop				
Others (Please specify)				

3. Can you share the data collection form you use to gather data and information for the process? (Please collect a paper version in addition to any digital copies).
4. How do you capture information related to farmers' preferences? How do you capture the preferences of the following clients?
- Men farmers
 - Women farmers?

- c. Male and female youth?
 - d. People with disabilities
5. How do you account for informal seed supply (use of saved seed, farmer to farmers seed exchanges etc.), in the demand forecasting methodology? Do you collect data or information on informal seed supply? Please describe.
 6. For which varieties of the following crops do you forecast seed demand? Write the varieties of each crop separated by comma.

Seed class	Maize	Wheat	Teff	Barely	Sorghum	Other Crops
EGS						
Certified Seed						
QDS						
Others						

Section B. Seed Allocation and Distribution

1. How is seed distributed in your region or at federal level (*conventional, DSM or both*), *who distributes seed and to whom?*

Variables	EGS	Certified seed	QDS	Other seeds
B1.1 Mode of seed allocation: How do you allocate seed? What are the factors considered? Is there established procedure or formula for seed allocation? (multiple responses)				
B1.2 To whom do you allocate seed? (seed comp, agro-dealer, agent, union, primary coop), region. Please note if women and youth are considered in seed allocation.				
B1.3 How do you coordinate allocation of seed? With whom do you coordinate? What are the steps in the coordination process?				
B1.4 What do you do when there is mismatch between seed demand and seed supply?				
B1.5 What are the strategies you often use to reduce the gap between seed demand and supply?				

Variables	EGS	Certified seed	QDS	Other seeds
<ul style="list-style-type: none"> • Off-season seed production • Allocation of whatever seed available on equitable basis for regions • Allocate to potential areas within regions • Advise farmers to use farm saved seed • Collect farm saved, clean and check for collect and allocate back 				
B1.6 Who distributes the seed? (agent, agro-dealer, union, primary coop). Please comment on if there is consideration of involving women and youth in seed distribution				
B1.7 How do you coordinate seed distribution?				
B1.8 With whom do you coordinate or collaborate in seed distribution?				
B1.9 What accountability procedures are in place in seed distribution to maintain seed quality?				
B1.10 What role does the ministry plays in determining the price of seed? How do you determine the price of seed? Please explain the process of setting price. Who else participates in seed price determination?				

Section C. Extension and Awareness Creation

1. What is the role of the MoA in awareness creation for newly released varieties?
2. Do you have specific strategy for creating awareness for women and youth farmers? Please explain the details.

Section D. Please explain the strengths and weaknesses of the MoA in accomplishing seed demand forecasting, aggregation, coordination and distribution of seed?

1. Strengths
2. Weaknesses

[Annex 2.2 Instruments for Zone, Woreda and Kebele](#)

Region: _____ Zone: _____ Woreda: _____ Kebele: _____

Date: _____

Details of the key informants:

No.	Name	Sex	Job Title	# of years of service	Contact:	
					Phone	email

1. Please explain how the seed demand is made in your kebele related to the issues listed below:

Issues	EGS	Certified	QDS	Others seed
1.1 What roles do the kebele office/Development Agent play in seed demand forecasting in your kebele?				
1.2 How do you collect data to forecast seed demand (digital, paper, etc.)?				
1.3. From whom do you collect the data? <ul style="list-style-type: none"> • All farmers in a kebele • Representative farmers • Model farmers • Pay special attention to female headed household 				
1.4 With what frequency do you collect the data: <ul style="list-style-type: none"> • Once in belg, • Once in meher, • Once every year, • Other (please specify) 				
1.5 What kinds of market intelligence do you rely on? <ul style="list-style-type: none"> • Past trends • Feedback from male farmers • Feedback from female farmers • Feedback from farmers with disabilities • Feedback from youth (20-29 years old) • Feedback from seed companies • Feedback from woreda • Government development plan • Other (please specify) 				
1.6 Where do you get the market information?				
1.7 At what level do you aggregate?				

Issues	EGS	Certified	QDS	Others seed
<ul style="list-style-type: none"> • Crop by variety • Other 				
1.8 To whom do you deliver the forecasted seed demand? Please specify the categories or variables for which you pass over the information to the next actor in chain.				
1.9 What is the seed demand forecasting horizon? For how many years ahead do you forecast the seed?				
1.10 Who determines the price of seed you sell? Does the kebele play role in seed price determination? How is the price determined? Please explain the process of setting price.				

2. Which of the following variables and/or points are largely considered while you collect data for seed demand forecasting? (Always; Less than often; Never; Not applicable)

Variable	EGS	Certified	QDS	Others seed
2.1 Area under cultivation				
2.2 Seeding rate				
2.3 Variety needed				
2.4 Number of households growing the crop				
2.5 Quantity of seed needed				
2.6 Seed replacement trend				
2.7 Opportunity for varietal change				
2.8 Volume of seed supply, trend				
2.9 Volume of seed use trend				
2.10 Use of farm saved seeds				
2.11 Informal exchange of seeds and planting materials				
2.12 Number of men growing the crop				
2.13 Number of women growing the crop				
2.14 Number of male youth growing the crop				
2.15 Number of female youth growing the crop				
2.16 Market opportunity for seed				
2.17 Market opportunity for seed grain				
Others (Please specify)				

3. Can you share the data collection form you use to gather data and information for the process? (Please collect a paper version in addition to any digital copies).

4. Please share the methodology that you are currently using to forecast demand: Denote the sample size, type of stakeholder, and the geography level. Survey methodology, data analyses techniques, disaggregation of summaries (i.e. gender, household type (male/female-headed) and age), data storage process, data quality assurance.
5. How do you account for informal seed supply (use of farm saved seed, farmer to farmers seed exchanges etc.), in the demand forecasting methodology? Do you collect data or information on informal seed supply? Please describe.
 - a. *Who are the informal actors you consult? (probe about informal actors that represent women, youth, PWD)*
 - b. *What kind of data and information do you collect from them? (probe about seeking sex and age disaggregated information)*
 - c. *Do you seek information related to gender and/ or youth to guide informal seed supply demand?*
 - d. *How do you use the information collected from the informal seed system actors?*
6. How do you capture information related to farmers' preferences? How do you capture the preferences of the following clients?
 - a. Men farmers
 - b. Women farmers'
 - c. Male and female youth
 - d. People with disabilities
7. For which varieties of the following crops do you forecast demand for seed in your kebele? Write the varieties of each crop separated by comma.

Seed class	Maize	Wheat	Teff	Barely	Sorghum	Other Crops
EGS						
Certified Seed						
QDS						
Others						

8. How many of these varieties are Hybrid, OPVs, self-pollinated?

Type of varieties	Maize	Wheat	Teff	Barely	Sorghum	other
Hybrid						
OPVs						
self-pollinated						
Other (specify)						

Section B. Seed Distribution: Approach and Technical Details

9. How is seed distributed in your kebele (*conventional, DSM or both*), *who distributes and to whom?*

Seed class	Mode of seed distribution (multiple responses)	Who distributes seed? (seed comp, agro-dealer, agent, union, primary coop). Please note when and where women and youth play a role as seed distributors.	Who receives seed from the producer? (farmer, agent, agro-dealer, union, primary coop). Please note sex and age differences in who receive seed
EGS			
Certified seed			
QDS			
Other seeds			

10. What mechanisms do you use to particularly reach female headed households while distributing certified seed?

11. What is the role of large institutions in purchase, sell and distribution of seed in emergency (governments, NGOs, etc.)? If yes, specify for which crop?

Type of institution	Buying (Yes/No)	Selling (Yes/No)	Distribute (yes/no), specify crops
MoA			
BoA			
UN agencies			
NGOs			
Other entity (specify)			

Section C. Extension and Awareness Creation

12. What type of awareness creation methods have been used regarding new/improved varieties of crops by different actors in the seed chain? (Response: mostly, often, sometimes, not at all)

Activity	Major actors (Please highlight role of women and youth where applicable)											
	Research centers	University	Development projects	Government	NGOs	Coops/union	Public seed enterprises	Other input providers	Private seed companies	SMS	DAs	Farmers
C1.1 Demonstration												
C1.2 Field day												
C1.3 Participatory variety evaluation/selection												
C1.4 Advertisement on media (radio, TV)												
C1.5 Seed company bill board												
C1.6 Seed company wears												

C1.7 Seed fairs & exhibitions												
C1.8 SMS text												
C1.9 Deliver seeds of new varieties in small pack												
C1.10 Web sites												
C1.11 WhatsApp groups												
Any other (Specify)												

13. What is the role of the kebele/DA agriculture office in awareness creation for newly released varieties? (Responses: Response: mostly, often, sometimes, not at all)

Activity	Response
C2.1 Organizing promotional means	
C2.2 Participation in promotional events	
C2.3 Cooperate with other partners doing promotion	
C2.4 Collect feedback from farmers	
C2.5 Design/ Guide promotional activities to reach women	
C2.6 Design/ Guide promotional activities to reach youth	
C2.7 Design/ Guide promotional activities to reach people with disabilities	
Any other (Specify)	

14. Do you have specific strategy for creating awareness for women and youth farmers? Please explain the details.

Section D. Please explain the strengths and weaknesses in the seed sector in your kebele regarding the following:

Category	Strengths	Weaknesses	Other comments / suggestions or recommendations?
D1. Capacity to assess demand			
D2. Infrastructure and digital technology needed for seed forecasting			
D3. Seed Production			
D4. Seed distribution			
D5. Price of seeds			

D6. Role of institutional buyers (such as government, NGOs)			
D7. Role of informal seed system actors			
D8. Role of markets where seed is sold/purchased			
D9. Role of agricultural research institutions in EGS and certified seeds' production and distribution (if any)			
D10. Knowledge dissemination and capacity building of male farmers			
D11. Knowledge dissemination and capacity building of female farmers			
D12. Knowledge dissemination and capacity building of youth farmers			
D13. Knowledge dissemination and capacity building of farmers with disabilities			
Others (specify)			

[Annex 2.3: Instruments for Public Seed Enterprises](#)

Production Region: _____ Production Zone: _____ Location of HQs: _____

Date: _____

Details of the key informants:

No.	Name	Sex	Job Title	Contact:	
				Phone	email

Section A. What types of crop and varieties of seed does your enterprise produce and how is the quantity determined?

1. What are the type of crops and varieties your enterprise usually produce?
2. Please specify the EGS and Certified seed produced by your enterprise.

EGS: _____

Certified seed: _____

3. For each category of seed produced, what is your seed production strategy?

Variables:	EGS	Certified seed
3.1 What is your seed production strategy? How do you produce? <ul style="list-style-type: none"> • Own farm • Contract farmers (supervised farmers' field; cooperatives) • Commercial farms • Others (please specify) 		
3.2 How do you maintain seed quality? <ul style="list-style-type: none"> • Internal quality control • External quality control • Both • Others (please specify) 		
3.3 If there is left over seed from previous year, how do you account for it? <ul style="list-style-type: none"> • Re-test and use if meets standard • Sell as grain for food • Just dispose as feed • Others (please specify) 		

4. For which varieties of the following crops do you forecast demand for seed? Write the varieties of each crop separated by comma.

Seed class	Maize	Wheat	Teff	Barely	Sorghum	Other Crops
EGS						
Certified Seed						

5. How many of these varieties are Hybrid, OPVs did you produce during the recent years?

Type of varieties	Maize	Wheat	Teff	Barely	Sorghum	Other
Hybrid						
OPVs						
self-pollinated						

6. Please explain the process you follow to determine the quantity of EGS and Certified Seed demanded so that you plan seed production? Please respond based on the following matrix:

Issues	EGS	Certified
6.1 How is the seed demand forecasted? <ul style="list-style-type: none"> • Modify based on last year company performance (trend) 		

Issues	EGS	Certified
<ul style="list-style-type: none"> • Seed demand comes from MoA/BoA • Company has its own plan • Company plan matched with BoA/MoA plan • Based on availability of basic seed, land, out-growers • Based on availability forex for importing basic seed of parental lines or import of vegetable seeds of registered varieties • Other (Please specify) 		
6.2 How do you collect data to forecast seed demand (digital, paper, etc.)?		
6.3 From whom do you collect the seed demand data? Please also specify the geographic levels (example: kebeles, woredas, zones etc.) <ul style="list-style-type: none"> • Farmers • Regional BoA • Federal MoA • From zones • From woredas • From kebeles • Use company's sales trend • Sample survey • Others (please specify) 		
6.4 What is the frequency of your data collection: <ul style="list-style-type: none"> • once in belg, • once in meher, • once every year, • Other (please specify) 		
6.5 Where do you get the market information? Please also specify the kinds of market information you collect. <ul style="list-style-type: none"> • From farmers (word-of-mouth) • From extension (woreda, zone or region) • From MoA • From distributors such unions, FSCs, agents, agro-dealers • Media • Others (please specify) 		
6.6 At what level do you aggregate the seed demand? <ul style="list-style-type: none"> • By crop by variety for each region • By crop by crop by variety for national level • Other (please specify) 		
6.7 What is the output of the forecasted seed demand? How do you express the end product of the seed demand forecasting process?		
6.8 How do you communicate the result? Who do you communicate your analyses and results to?		
6.9 How do you use the forecasted seed demand in planning, production & marketing?		

Issues	EGS	Certified
6.10 What is the seed demand forecasting horizon? For how many years ahead do you forecast the seed?		

7. Do you make your own seed demand estimation? If so, which of the following variables and/or points are largely considered while you collect data for seed demand forecasting? (Always; Less than often; Never; Not applicable)

Variable	EGS	Certified
7.1 Area under cultivation		
7.2 Seeding rate		
7.3 Variety needed		
7.4 Number of households growing the crop		
7.5 Quantity of seed needed		
7.6 Seed replacement trend		
7.7 Opportunity for varietal change		
7.8 Volume of seed supplied by other seed producers		
7.9 Volume of seed use (trend)		
7.10 Informal exchange of seeds and planting materials		
7.11 Market opportunity both for seed & grain		
7.12 Weather forecast data		
Others (Please specify)		

8. What is the difference between seed demand forecasting for EGS and Certified seed?

9. How do you account for informal seed supply (use of saved seed, farmer to farmers seed exchanges etc.), in the demand forecasting methodology?

10. How do you capture information related to farmers' preferences?

- Word-of-mouth
- Media
- Market demand for grain users
- Field days
- Media

Section B. Seed Storage and Distribution

11. How do you store seed and distribute?

Variables:	EGS	Certified seed
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B1.1 What is the distribution area for their market? Is it nationwide? Or is it for specific region? Is it for selected geographies?		
B1.2 What is your seed distribution mechanism? <ul style="list-style-type: none"> • To who do you deliver the seed? • Do you report/channel seed through the MoA/RBoA? • What is your seed marketing strategy (sales personnel, agent, agro-dealers?) • Others (please specify) 		
B1.3 Who are the actors in the seed distribution channel? To whom do you sell? <ul style="list-style-type: none"> • Enterprise sales staff • Cooperatives • Unions • Individual agents • Agro-dealers • Men farmers • Women farmers • Youth • Others (please specify) 		
B1.4 What do you do if the seed demand is less than the supply? What about when the demand is more than the supply?		
B1.5 What role does your enterprise play in determining the price of seed? How do you determine the price of seed? Please explain the process of setting price. Who else is involved in seed price determination?		

12. What is your comment on how price of seed is determined in Ethiopia?

13. How do you package and distribute seed? Do you consider farmers preference in packaging? What other factors determine packing size of seed?

14. Do you consider women and youth in determining packing size of seed? How?

Section C. Extension and Awareness Creation

15. How do you create awareness for newly released varieties or seed you produce? (Responses: mostly, often, sometimes, not at all)

Activity	Response
C1.1 Organizing promotional forum	
C1.2 Participation on promotional events organized by others	
C1.3 Co-organizing promotional forum	
C1.4 Use media	

Any other (please specify) _____

16. Do you have specific strategy for creating awareness for women and youth farmers? Please explain the details.

Section D. Please explain the strengths and weaknesses of your enterprise

Issues	EGS	Certified seed
D1. What are the strengths of your enterprise in seed demand forecasting?		
D2. What are the weaknesses of your enterprise in seed demand forecasting?		
D3. Do you hire specialty firms/persons to conduct seed demand forecasting for your firm? Why?		
D4. What capacities do you need to strengthen to enhance your seed demand forecasting?		

Annex 2.4: Instruments for Private Seed Company

Production Region: _____ Production Zone: _____ Location of HQs: _____

Date: _____

Details of the key informants:

No.	Name	Sex	Job Title	Contact:	
				Phone	email

Section A. What types of crop and varieties of seed does your company produce and is the quantity determined?

1. What are the type of crop seeds and varieties your enterprise usually produces?

2. Please specify the EGS and Certified seed produced by your company.

EGS: _____

Certified seed: _____

3. For varieties that you do not have your own EGS, where do you access EGS from to producer certified seeds?
4. How do you determine the amount of EGS you need from others? Do you communicate that amount needed to your EGS supplier?
5. How often do you face shortfall in EGS? What measures do you undertake as a result of that shortage?
6. For each category of seed produced, what is your seed production strategy?

Variables:	EGS	Certified seed
6.1 What is your seed production strategy? How do you produce? <ul style="list-style-type: none"> • Own farm • Contract farmers (supervised farmers' field; cooperatives) • Commercial farms • Others (please specify) 		
6.2 How do you maintain seed quality? <ul style="list-style-type: none"> • Internal quality control • External quality control • Both • Others (specify) 		
6.3 If there is left over seed from previous year, how do you account for it? <ul style="list-style-type: none"> • Re-test and use if meets standard • Sell as grain for food • Just dispose as feed • Others (please specify) 		

7. For which varieties of the following crops do you forecast demand for seed? Write the varieties of each crop separated by comma.

Seed class	Maize	Wheat	Teff	Barely	Sorghum	Other Crops
EGS						
Certified Seed						

8. How many of these varieties are Hybrid, OPVs did you produce during the recent years?

Type of varieties	Maize	Wheat	Teff	Barely	Sorghum	Other
Hybrid						
OPVs						
self-pollinated						

9. Please explain the process you follow to determine the quantity of EGS and Certified Seed demanded so that you plan seed production? Please respond based on the following issues:

Issues	EGS	Certified
9.1 How is the seed demand forecasted? <ul style="list-style-type: none"> • Modify based on last year company performance (trend) • Seed demand comes from MoA/BoA • Company has its own plan • Company plan matched with BoA/MoA plan • Based on availability of basic seed, land, out-growers • Based on availability forex for importing basic seed of parental lines or import of vegetable seeds of registered varieties • Other (Please specify) 		
9.2 How do you collect data to forecast seed demand (digital, paper, etc.)?		
9.3 From whom do you collect the seed demand data? Please also specify the geographic levels (example: kebeles, woredas, zones etc.) <ul style="list-style-type: none"> • Farmers • Regional BoA • Federal MoA • From zones • From woredas • From kebeles • Use company's sales trend • Sample survey • Others (please specify) 		
9.4 What is the frequency of your data collection: <ul style="list-style-type: none"> • once in belg, • once in meher, • once every year, • Other (please specify) 		
9.5 Where do you get the market information? Please also specify the kinds of market information you collect. <ul style="list-style-type: none"> • From farmers (word-of-mouth) • From extension (woreda, zone or region) • From MoA • From distributors such unions, FSCs, agents, agro-dealers • Media • Others (please specify) 		
9.6 At what level do you aggregate the seed demand?		

Issues	EGS	Certified
<ul style="list-style-type: none"> • By crop by variety for each region • By crop by crop by variety for national level • Other (please specify) 		
9.7 What is the output of the forecasted seed demand? How do you express the end product of the seed demand forecasting process?		
9.8 How do you communicate the result? Who do you communicate your analyses and results to?		
9.9 How do you use the forecasted seed demand in planning, production & marketing?		
9.10 What is the seed demand forecasting horizon? For how many years ahead do you forecast the seed?		

10. Which of the following variables and/or points are largely considered while you collect data for seed demand forecasting? (Always; Less than often; Never; Not applicable)

Variable	EGS	Certified
10.1 Area under cultivation		
10.2 Seeding rate		
10.3 Variety needed		
10.4 Number of households growing the crop		
10.5 Quantity of seed needed		
10.6 Seed replacement trend		
10.7 Opportunity for varietal change		
10.8 Volume of seed supplied by other seed producers		
10.9 Volume of seed use (trend)		
10.10 Informal exchange of seeds and planting materials		
10.11 Market opportunity both for seed & grain		
10.12 Weather forecast data		
Others (Please specify)		

11. What is the difference between seed demand forecasting for EGS and Certified seed?

12. How do you account for informal seed supply (use of saved seed, farmer to farmers seed exchanges etc.), in the demand forecasting methodology?

13. How do you capture information related to farmers' preferences?

- Word-of-mouth
- Media

- Market demand for grain users
- Field days

Section B. Seed Storage, and Distribution

14. How do you distribute seed?

Variables:	EGS	Certified seed
B1.1 What is the distribution area for their market? Is it nationwide? Or is it for specific region? Is it for selected geographies?		
B1.2 What is your seed distribution mechanism? <ul style="list-style-type: none"> • To who do you deliver the seed? • Do you report/channel seed through the MoA/RBoA? • What is your seed marketing strategy (sales personnel, agent, agro-dealers?) • Others (specify) 		
B1.3 Who are the actors in the seed distribution channel? <ul style="list-style-type: none"> • Enterprise sales staff • Cooperatives • Unions • Individual agents • Agro-dealers • Men farmers • Women farmers • Youth • Others (please specify) 		
B1.4 What do you do if the seed demand is less than the supply? What about when the demand is more than the supply?		
B1.5 What role does your company plays in determining the price of seed? How do you determine the price of seed? Please explain the process of setting price. Who else are involved in determining the price of EGS?		

15. What is your comment on how price of seed is determined in Ethiopia?

16. How do you package and distribute seed? Do you consider farmers preference in packaging? What other factors determine packing size of seed?

17. Do you consider women and youth in determining packing size of seed? How?

Section C. Extension and Awareness Creation

18. How do you create awareness for newly released varieties or seed you produce? (Responses: mostly, often, sometimes, not at all)

Activity	Response
C1.1 Organizing promotional forum	
C1.2 Participation on promotional events organized by others	
C1.3 Co-organizing promotional forum	
C1.4 Use media	
Any other (please specify)	

19. Do you have specific strategy for creating awareness for women and youth farmers? Please explain the details.

Section D. Please explain the strengths and weaknesses of your company

Issues	EGS	Certified seed
D1. What are the strengths of your company in seed demand forecasting?		
D2. What are the weaknesses of your company in seed demand forecasting?		
D3. Do you hire specialty firms/persons to conduct seed demand forecasting for your firm? Why?		
D4. What capacities do you need to strengthen to enhance your seed demand forecasting?		

[Annex 2.5: Instruments for Seed Producer Cooperatives](#)

Production Region: _____ Production Zone: _____ Location of HQs: _____

Date: _____

Details of the key informants:

No.	Name	Sex	Job Title	Contact:	
				Phone	email

Section A. What types of crop and varieties of seed does your coop/union produce and how is the quantity determined?

1. What are the type of crops and varieties your cooperative usually produces?
2. Please specify the Certified seed and Quality Declared Seed (QDS) produced by your cooperative.

Certified seed: _____

QDS: _____

3. Where do you access “starter seeds” or EGS to produce your certified seeds?
4. How do you determine the amount of EGS you need from others? Do you communicate that amount needed to your EGS supplier?
5. How often do you face shortfall in EGS? What measures do you undertake as a result of that shortage?
6. For each category of seed produced, what is your seed production strategy?

Variables:	Certified seed	QDS
6.1 What is your seed production strategy? How do you produce? <ul style="list-style-type: none"> • On farms of member cooperatives (earlier agreement made) • Collect seed from cooperative members (no earlier agreement made) • Contract farmers (supervised farmers’ field; cooperatives) • Rented land • Others (please specify) 		
6.2 How do you maintain seed quality? <ul style="list-style-type: none"> • Internal quality control • External quality control • Both • Others (please specify) 		
6.3 If there is left over seed from previous year, how do you account for it? <ul style="list-style-type: none"> • Re-test and use if meets standard • Sell as grain for food • Just dispose as feed • Others (please specify) 		

7. For which varieties of the following crops do you forecast demand for seed? Write the varieties of each crop separated by comma.

Seed class	Maize	Wheat	Teff	Barely	Sorghum	Other Crops
Certified Seed						
QDS						

8. How many of these varieties have you produced during the recent years?

Type of varieties	Maize	Wheat	Teff	Barely	Sorghum	Other crops
Certified Seed						
QDS						

9. Please explain the process you follow to determine the quantity of Certified Seed and QDS demanded so that you plan seed production? Please respond based on the following matrix:

Issues	Certified seed	QDS
<p>9.1 How is the seed demand forecasted?</p> <ul style="list-style-type: none"> • Modify based on last year company performance (trend) • Seed demand comes from MoA/BoA • Company has its own plan • Company plan matched with BoA/MoA plan • Based on availability of basic seed, land, out-growers • Based on availability forex for importing basic seed of parental lines or import of vegetable seeds of registered varieties • Other (Please specify) 		
9.2 How do you collect data to forecast seed demand (digital, paper, etc.)?		
<p>9.3 From whom do you collect the seed demand data? Please also specify the geographic levels (example: kebeles, woredas, zones etc.)</p> <ul style="list-style-type: none"> • Farmers • Regional BoA • Federal MoA • From zones • From woredas • From kebeles • Use company's sales trend • Sample survey • Others (please specify) 		

Issues	Certified seed	QDS
9.4 What is the frequency of your data collection: <ul style="list-style-type: none"> once in belg, once in meher, once every year, Other (please specify) 		
9.5 Where do you get the market information? Please also specify the kinds of market information you collect. <ul style="list-style-type: none"> From farmers (word-of-mouth) From extension (woreda, zone or region) From MoA From distributors such unions, FSCs, agents, agro-dealers Media Others (please specify) 		
9.6 At what level do you aggregate the seed demand? <ul style="list-style-type: none"> By crop by variety for each region By crop by variety for national level Other (please specify) 		
9.7 What is the output of the forecasted seed demand? How do you express the end product of the seed demand forecasting process?		
9.8 How do you communicate the result? Who do you communicate your analyses and results to?		
9.9 How do you use the forecasted seed demand in planning, production & marketing?		
9.10 What is the seed demand forecasting horizon? For how many years ahead do you forecast the seed?		

10. Do you make your own seed demand estimation? If so, which of the following variables and/or points are largely considered while you collect data for seed demand forecasting? (Always; Less than often; Never; Not applicable)

Variable	Certified	QDS
10.1 Area under cultivation		
10.2 Seeding rate		
10.3 Variety needed		
10.4 Number of households growing the crop		
10.5 Quantity of seed needed		
10.6 Seed replacement trend		
10.7 Opportunity for varietal change		
10.8 Volume of seed supplied by other seed producers		

10.9 Volume of seed use (trend)		
10.10 Informal exchange of seeds and planting materials		
10.11 Market opportunity both for seed & grain		
10.12 Weather forecast data		
Others (please specify)		

11. How do you account for informal seed supply (use of saved seed, farmer to farmers seed exchanges etc.), in the demand forecasting methodology?

12. How do you capture information related to farmers' preferences?

- Word-of-mouth
- Media
- Market demand for grain users
- Field days
- Media

Section B. Seed Storage and Distribution

13. How do you distribute seed?

Variables:	Certified seed	QDS
B1.1 What is the distribution area for marketing seed? Is it nationwide? Or it for specific region? Is it for selected geographies?		
B1.2 What is your seed distribution mechanism? <ul style="list-style-type: none"> • To who do you deliver the seed? • Do you report/channel seed through the MoA/RBoA, NGOs or contract growing? • What is your seed marketing strategy? • Others (please specify) 		
B1.3 Who are the actors in the seed distribution channel? <ul style="list-style-type: none"> • Deliver bulk seed to contract party of outgrowing scheme • Cooperative/unions seed marketing committee • Unions • Bulk sale to NGOs, BoA, public seed enterprises, agro-dealers, projects • Others (please specify) 		
B1.4 What do you do if the seed demand is less than the supply? What about when the demand is more than the supply?		
B1.5 What role do you play in determining the price of seed? How do you determine the price of seed? Please explain the process of setting price. Who else is involved in seed price determination?		

- 14. What is your comment on how price of seed is determined in Ethiopia?
- 15. How do you package and distribute seed? Do you consider farmers preference in packaging? What other factors determine packing size of seed?
- 16. Do you consider women and youth in determining packing size of seed? How?

Section C. Extension and Awareness Creation

17. How do you create awareness for newly released varieties or seed you produce? (Responses: mostly, often, sometimes, not at all)

Activity	Response
C1.1 Organizing promotional forum	
C1.2 Participation on promotional events organized by others	
C1.3 Co-organizing promotional forum	
C1.4 Use media	
Any other (please specify)	

18. Do you have specific strategy for creating awareness for women and youth farmers? Please explain the details.

Section D. Please explain the strengths and weaknesses in of your coop/union

Issues	EGS	Certified seed
D1. What are the strengths of your cooperative in seed demand forecasting?		
D2. What are the weaknesses of your cooperative in seed demand forecasting?		
D3. Do you hire specialty firms/persons to conduct seed demand forecasting for your firm? Why?		
D4. What capacities do you need to strengthen to enhance your seed demand forecasting?		

Annex 2.6: Instruments for Research Institutes

Name of the Research Institute: _____: Location of HQ _____

Date: _____

Details of the key informants:

No.	Name	Sex	Job Title	Contact:	
				Phone	email

Section A. Seed Demand Forecasting: Approach and Technical Details

1. For which varieties of the following crops do you forecast seed demand? Write the varieties of each crop separated by comma

Seed class	Maize	Wheat	Teff	Barely	Sorghum	Other Crops
EGS						
Certified Seed						

2. Please explain the role of the research institute in seed demand forecasting related to the following:

Issues	EGS	Certified seed
2.1 What role(s) does your research institute play in seed demand forecasting?		
2.2 How does the research institute play this role? What do you start with? Explain the steps in the methodology used for seed forecasting.		
2.3 How do you collect data to forecast seed demand (digital, paper, etc.)?		
2.4 From whom do you collect the data? <ul style="list-style-type: none"> • Certified seed producers • Regional BoAs • Federal MoA • Farmers • Institution's past trend • Other (specify) 		
2.5 From where (which geographies and levels) do you collect the data?		
2.6 With what frequency do you collect the data:		

Issues	EGS	Certified seed
<ul style="list-style-type: none"> Once in belg, Once in meher, Once every year, Quarterly Other (please specify) 		
2.7 What do you project from the seed demand forecasting? What is the end product of the seed demand forecasting? Please specify the metrics.		
2.8 At what level do you aggregate? <ul style="list-style-type: none"> By crop by Variety level By crop by variety by regional demand By crop by variety by federal demand By crop by variety by seed producer, who signed contract for EGS Other (please specify) 		
2.9 How do you use the forecasted seed demand? <ul style="list-style-type: none"> Own production plan Share with other agencies (specify) Other (please specify) 		
2.10 What is the seed demand forecasting horizon? For how many years ahead do you forecast the seed?		

3. Which of the following metrics and/or points are largely considered while you collect data for seed demand forecasting?

Variable	From whom is the data collected?	How do you collect the data?	When do you collect?
3.1 Area under cultivation			
3.2 Seeding rate			
3.3 Variety needed			
3.4 Introduction of new variety			
3.5 Number of households growing the crop			
3.6 Quantity of seed needed			
3.7 Seed replacement trend			
3.8 Opportunity for varietal change			
3.9 Volume of seed supply			
3.10 Volume of seed use trend			
3.11 Market opportunity both for seed & grain			
Others (Please specify)			

4. How do you capture information related to farmers' preferences?
5. How do you account for informal seed supply (use of saved seed, farmer to farmers seed exchanges etc.), in the demand forecasting methodology? Do you collect data or information on informal seed supply? Please describe.
6. How does the mismatch in seed demand and seed supply in the downstream of the seed value chain affect the production of EGS? How does your institute handle the mismatch?
7. How do you store seed and distribute?

Variables:	EGS	Certified seed
7.1 What is your seed distribution mechanism? <ul style="list-style-type: none"> • To who do you deliver the seed? • Do you report/channel seed through the MoA/RBoA? • What is your seed marketing strategy (sales personnel, agent, agro-dealers?) • Others (please specify) 		
7.2 What do you do if the seed demand is less than the supply? What about when the demand is more than the supply?		
7.3 How do you determine the price of EGS you sell to certified seed producers? Please explain the process of setting price. Who else are involved in determining the price of EGS?		

Section B. Extension, Awareness Creation and Collaboration

8. What is the role of your Institute in awareness creation for newly released varieties? If you do the following activities, please explain with whom you conduct it and how you conduct it?

Activity	With whom?	How do you conduct it?
B1.1 Organizing promotional means		
B1.2 Conduct pre-extension demonstration		
B1.3 Use participatory variety selection		
B1.4 Participation on promotional events		
B1.5 Cooperate with other partners doing promotion		
B1.6 Collect feedback from farmers		
Any other (specify)		

9. With whom does your institute collaborate?
 - a. Seed companies;

- b. NGOs,
- c. CGIAR centers
- d. Government organizations
- e. Commercial farms,
- f. Others (specify)

10. What type of collaboration do you have with CGIAR in seed demand forecasting? How do you coordinate and collaborate with the following?
- a. Germplasm acquisition
 - b. Variety evaluation
 - c. Seed demand forecasting?
 - d. Seed demand creation
 - e. Other collaborations (specify)

11. What is the role of the research institute in this collaboration process?

12. Do you provide any technical capacity building for others to create seed demand? If yes, to whom? On what issues?

Section C. Constraints and Opportunities

13. What are the constraints you institute face in estimating seed demand and seed demand creation? Please explain from the perspectives of EGS and certified seed.

14. What opportunities do you see for your institute in seed demand forecasting and seed demand creation? Please explain from the perspectives of EGS and certified seed.

Annex 3: Seed Demand Data Collection Instruments used by BoA at Different Levels

Annex 3.1: Seed Demand Data Collection Format at Kebele Level

i) Amhara

Woreda: _____ Kebele: _____

Seed Demand Collection Form

Sr. n	Name of the farmer	Sex	Village	Crop type	Variety	Area coverage
1						
2						

3						
4						

ii) Oromia

Woreda: _____ Kebele: _____

Demand collection of different types of inputs for Meher season

Sr. n	Farmers name	Fertilizer (qt)			Maize seed by variety					Teff		chemical		Farmers Signature
		NPS	Urea	Total	BH660	BH540	Shone	Limu	BH546	Qunco	Gulilisa	2-4D	R/up	
1														
2														
3														
4														
5														

[Annex 3.2: Format Used by Woreda BoA to Collect Seed Demand Data](#)

i) Amhara

Region: _____ Zone: _____ Woreda: _____

Sr. n	Name of Kebele	Maize (qt)				Wheat (qt)			Teff (qt)			
		BH661	BH660	BH540	Total	Kekeba	Ogoloche	Total	Estub	Kuncho	Cross37	Total
1												
2												
3												
4												
	Total											

ii) Oromia

Region: _____ Zone: _____ Woreda: _____

Woreda name ___/Arsi Zone									
Sr.n	Input type	unit	Demand plan				Farmers (#)		Total
	Improved seeds of crops and other types		For irrigation	For belg	For meher	Total	Male	Female	
1	Maize								
2									
3									
4									

Annex 3.3: Format Used by Zonal BoA to Collect Seed Demand Data

i) Amhara

Region: _____ Name of the zone: _____

Year: 2020/2021 production season

S/N	Name of Woredas	Cooperative Union	Maize					Total	Wheat				Total
			BH660	BH661	Bh546	Limu	Shone		Kekeba	Danfe	Tay	Ogoloche	
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
Total seed													

ii) Oromia

Region: _____ Name of the zone: _____

Year: 2020/2021 production season

Woreda name/Arsi Zone									
Sr.n	Input type	unit	Demand plan				Farmers particiate (#)		Total
	Improved seeds of crops and other types		For irrigation	For belg	For meher	Total	Male	Female	
1	Maize								
2									
3									
4									

Annex 4: Schematic Summary for Certified Seed Demand Forecasting Process at Different Levels

Annex 4.1: Federal MoA Certified Seed Demand Forecasting Process

Data Needs:

- Area under cultivation
- Seeding rate
- Variety & volume of certified seeds of maize, wheat, tef, barley, & sorghum
- Volume of seed supply & use trend
- Volume of left-over seed by crop & variety from previous season

Data Collection Process:

- Coordinate seed demand collection at national level
- Follow up on timely seed collection by regional BoA
- Receive seed demand data from each region during September & October each year

Data Storage:

- Seed demand data is collected both in hardy and soft copies through emails; stored mainly electronically using excel sheet

Data Compilation:

- Aggregate the submitted seed demand data by crop, variety, volume & by region

Data Curation / QA-QC:

- Adjust submitted demand data based on previous years' certified seed use trend as well as development plans (GTPI, GTPII)

Data Analyses / methodology:

- Compare demand and supply of the current year with previous year
- Adjust demand based previous trend and national development plan

Results Generation:

- Volume of seed demand by crop, variety & by region
- Estimated volume of basic seed required
- Budget required for purchase of certified seed & other inputs
- Plan for effective eventual distribution
- Estimate credit need for production & distribution

Actions Communicated:

- Communicate the endorsed seed price to each region formally through letter
- Communicate to every region seed allocated by volume & variety and from which seed producer it will be supplied

Actions Taken:

- Participate as observer at price determination meeting of the public seed enterprises
- Endorse seed price, which is determined by the public seed enterprises
- Organize meeting with regional BoA to agree on procedures of seed allocation
- Follow up with regions seed production, allocation & distribution
- Follow up that quality seed is distributed & no adulteration along the distribution route
- Demonstrate new varieties
- Organize national field days
- Promote the use of new seeds through media
- Provide ToT for extension workers on how to work with women & youth
- Promote creation of women only farmers meeting

Results use/aggregation:

- Use the seed demand data to allocate seed for regions proportional to the submitted regional demand & based on previous years seed consumption trend
- Use the demand data to identify basic seed gaps
- Use the demand data to search for seed which is in short supply from other sources

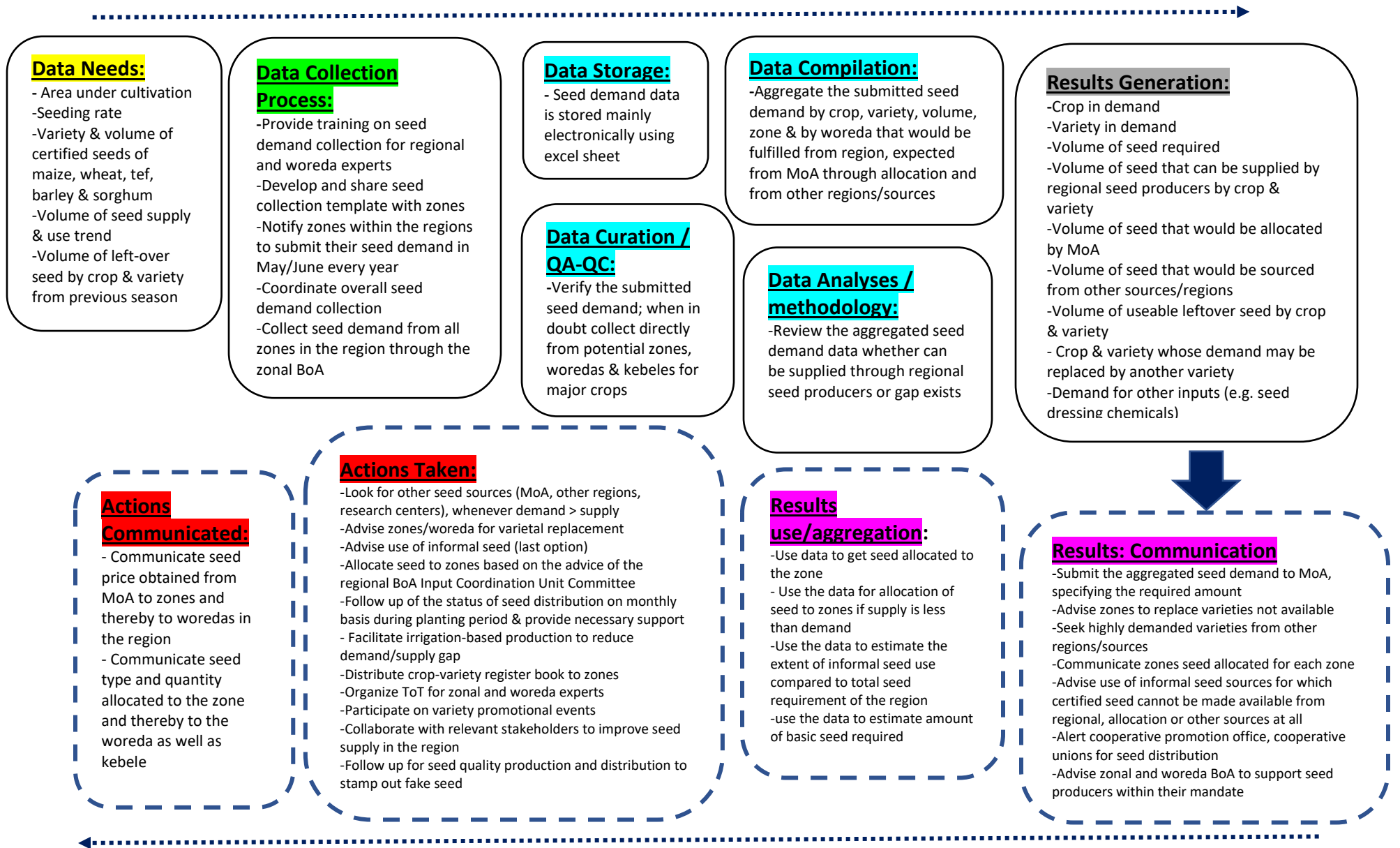
Results: Communication

- Communicate volume of seed demand by variety that could be allocated by federal to each region

Remark (Federal MoA) for Certified seed:

- Observer at seed price determination meeting; endorses seed price; poor social inclusiveness (esp. youth & disabilities)
- Inadequate capacity building strategies and actions for demand data collection, processing, and storage; -Seed demand collection and storage is not yet digitalized

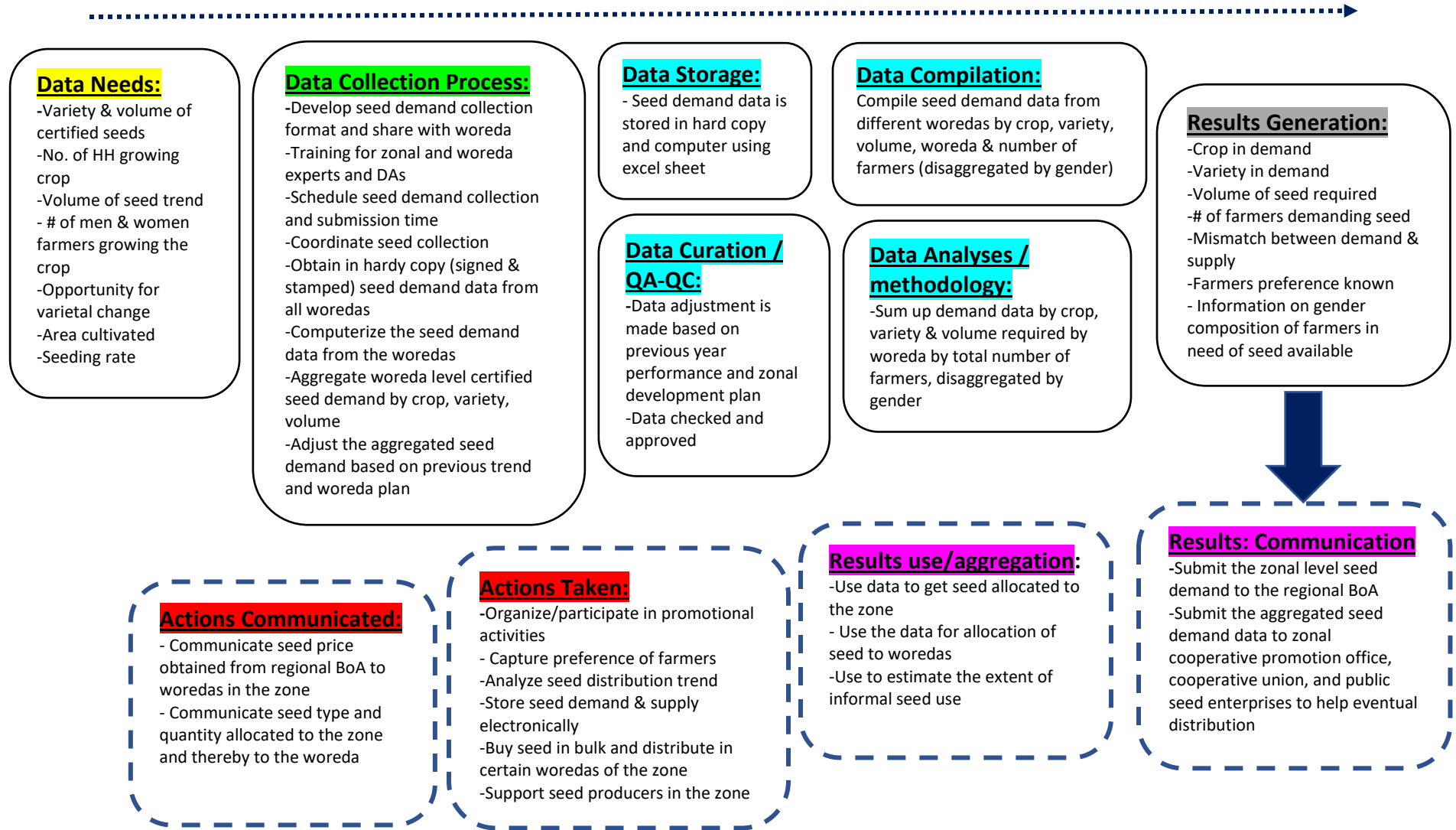
Annex 4.2: Regional BoA Certified Seed Demand Forecasting Process



Remark (Regional BoA) for Certified seed:

- No role in seed price determination; poor social inclusiveness (women, youth & disabilities); -Inadequate capacity building strategies and actions; seed demand data collection is not yet digitalized
- Less involvement in promotional activities; lack of adequate time series seed demand & supply data; increasing effort by regions to be self-sufficient in seed supply

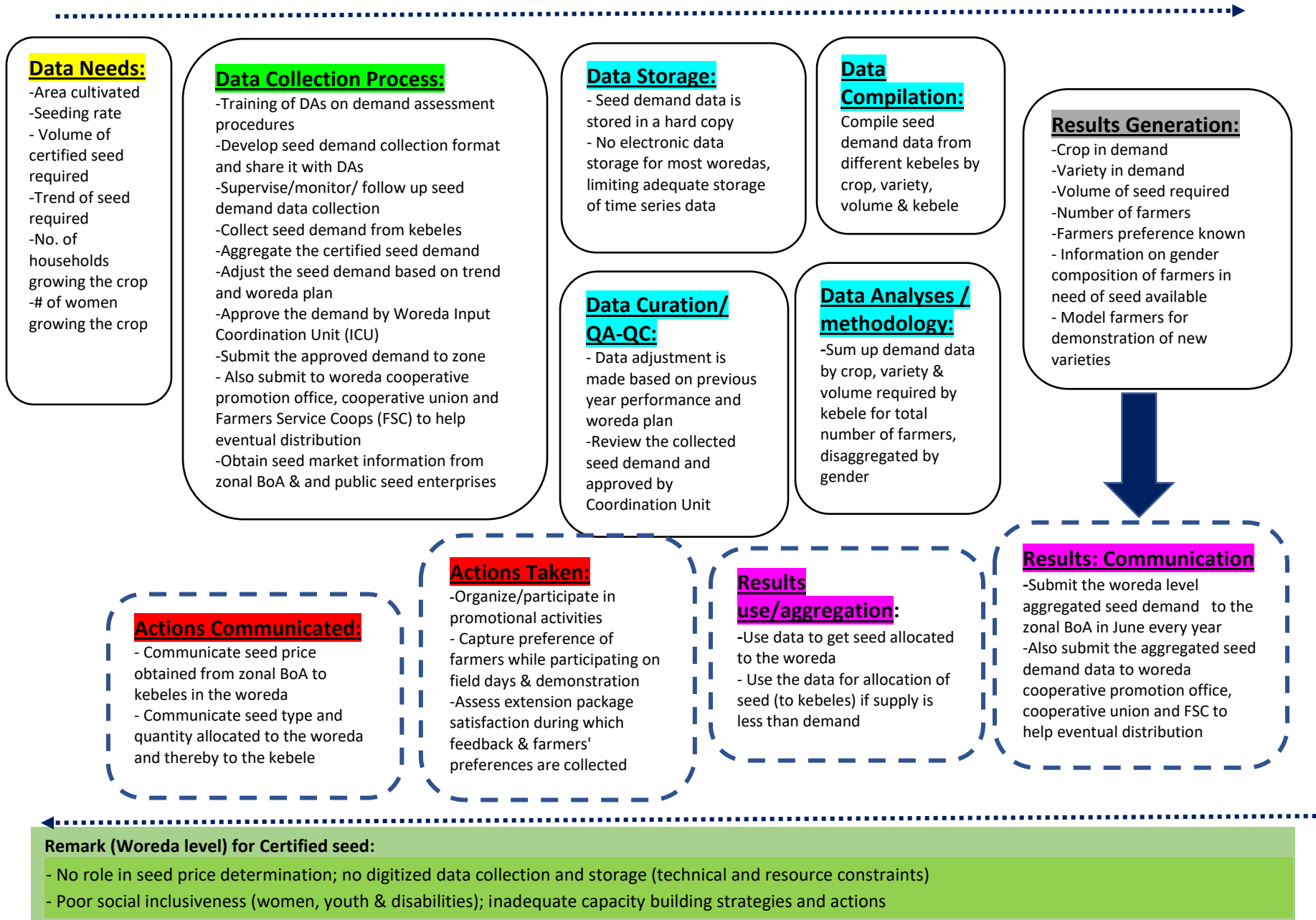
Annex 4.3: Zonal BoA Certified Seed Demand Forecasting Process



Remark (Zonal BoA) for Certified seed:

- No role in seed price determination; poor social inclusiveness (women, youth & disabilities); inadequate capacity building strategies and actions
- Low involvement in promotional activities; need for technical & infrastructure development is high

Annex 4.4: Woreda level Certified Seed Demand Forecasting Process



Annex 4.5: Kebele level Certified Seed Demand Forecasting Process

Data Needs:

- Area cultivated
- Seeding rate
- Volume of certified seed demanded by farmer
- Trend of volume of seed demanded
- No. of households growing the crop (men & women)
- Use of farm saved seeds, informal seed exchange
- Agro-ecology of the kebele
- Market opportunity for the grain

Data Collection Process:

- Get seed demand collection format from woreda BoA
- Training from woreda BoA
- Involve development team in planning in seed demand collection
- Create awareness of farmers about new varieties
- Collect seed demand from each farmer.
- No special consideration is given for preferences of women, youth and disabilities

Data Storage:

- Seed demand data is predominantly stored in hard copy.

Data Compilation:

- Compile seed demand data from different sub-kebele by crop, variety and volume

Data Curation/ QA-QC:

- The seed demand data collected from the sub-kebeles is checked whether it fits to the cultivated land
- Data adjustment is made based on previous year performance and kebele plan
- Data checked and approved

Data Analyses/ methodology:

- Sum up demand data by crop, variety & volume required by farmer & gender at kebele level
- Compare with past trend
- Check adaption of demanded variety
- Make adjustment based on past trend and current plan

Results Generation:

- Crop in demand
- Variety in demand
- Volume of seed required
- Number of farmers demanding seed
- Farmers preference known
- Information on gender composition of farmers in need of seed available



Actions Communicated:

- Communicate seed price obtained from woreda Agr office to farmers
- Communicate to farmers the inputs type and quantity allocated to the kebele

Actions Taken:

- Distribute seed when allocated to the kebele
- Advice farmers to use informal seed source when supply is less than demand
- Give priority for women when supply is less than demand

Results use/aggregation:

- Use data to get seed to be allocated to the kebele
- Use the data to distribute seed to farmers if supply is less than demand

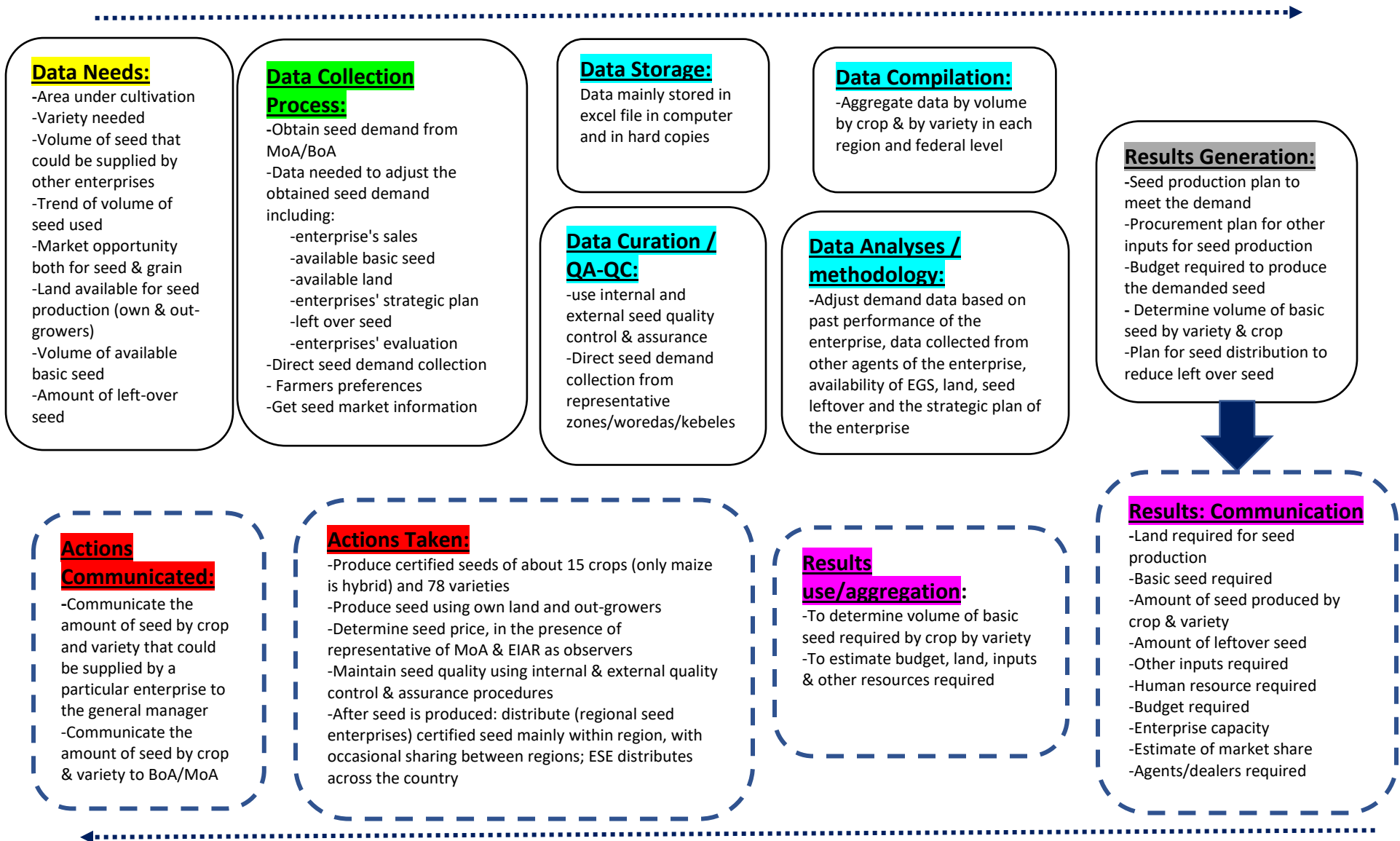
Results: Communication

- Get the data approved by kebele administration
- Submit the approved seed demand aggregated at kebele level to the woreda agri. office in June every year

Remark (Kebele level) for Certified seed:

- No EGS seed demand forecasting; No role in seed price determination; No digitized data collection and storage (technical and resource constraints)
- High logistic problem for DAs and hence more reliance on kebele development team (farmers groups) for seed demand forecasting;
- Poor social inclusiveness

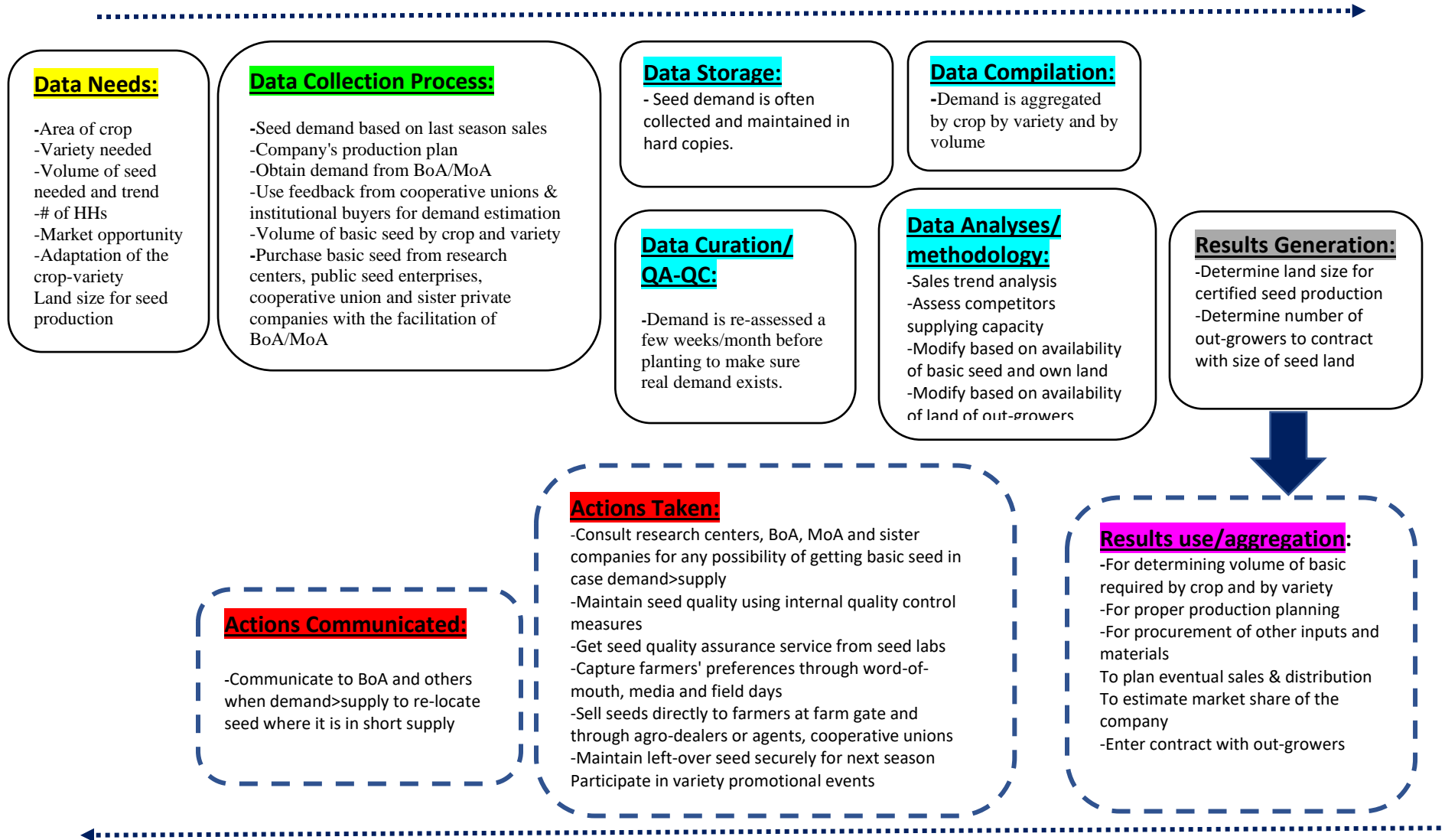
Annex 4.6: Public Seed Enterprise Certified Seed Demand Forecasting Process



Remark (Public Seed Enterprise) for Certified seed:

- Volume of certified seed supply by regional public seed enterprises is increasing over time; direct seed marketing and conventional distribution are used for seed marketing & distribution
- Public seed enterprises take less action when demand is more than supply; DSM and conventional seed distribution are used in seed marketing & distribution;
- MoA & EIAR are observers when public seed enterprises are determining price; MoA endorses the seed prices and shares with the regional BoA;
- The public seed enterprises noted the need for independence in seed price determination; seed delivery in small seed pack is less common;

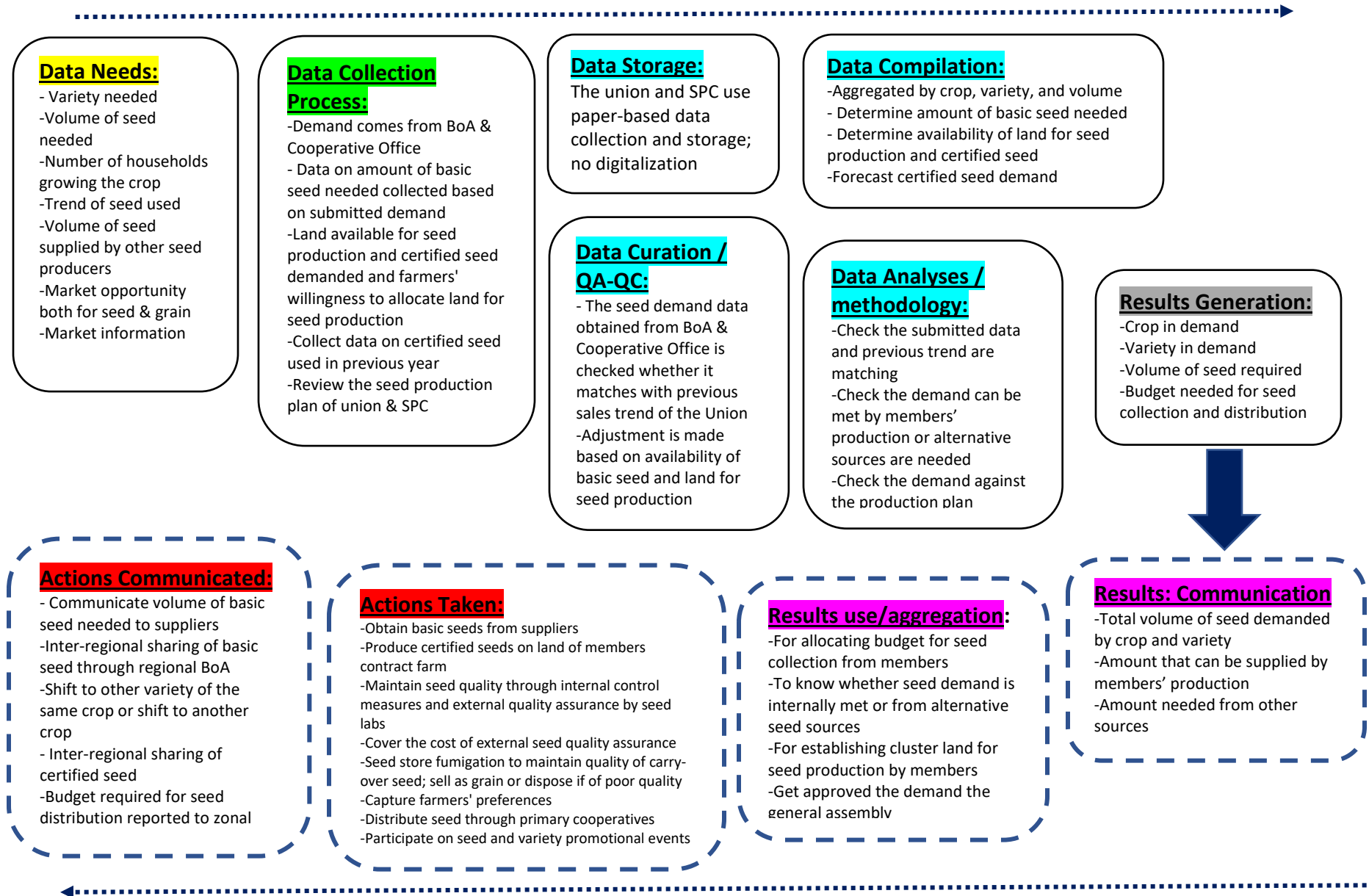
Annex 4.7: Private Seed Companies Certified Seed Demand Forecasting Process



Remark (Private Seed Companies) for Certified seed:

- Certified seed demand is just made for a year; informal seed demand is not considered by the private seed companies
- Private companies are negatively affected by price fixed by the public seed companies; private seed companies badly feel that price fixation is not inclusive
- small seed package is not common practice as it is expensive to prepare from the companies side;
- Social inclusion is not commonly used in seed package and distribution as well as awareness creation; technical and infrastructure capacity building required.

Annex 4.8: Cooperative unions & SPC level, only for Wheat Certified Seed Demand Forecasting Process



Remark (Union & SPC) for Certified seed:

- Cooperative unions & SPCs face shortage of basic seed (by volume and type of crop & variety); No role in seed price determination; but adds minimal commission, transport, loading and unloading on top of the seed price. The additions are determined by zonal Cooperative Promotion Office
- Lack of transparency and inclusiveness in seed price determination; lack of quality-based pricing; minimal effort to deliver seed in small seed pack

Annex 5: Varieties of Crops for which Demand Forecasting is Made

Annex 5.1: Certified Maize Varieties

A total of 25 varieties were reported by stakeholders at different levels. The varieties of maize for which certified seed demand is forecasted at different levels is shown in Annex Table 4.1. BH660, BH661, BH546 are the most widely reported maize varieties for which demand data is collected. The MoA reported that it forecasts the demand for some varieties like Melkassa but these are not in the list reported by the two regions included in the assessment. These varieties are adapted more to lowland areas and perhaps used in the other regions not covered in this study. The varieties of maize for which certified seed demand are given in Annex Table 4.1.

Annex Table 5.1: Maize variety for which certified seed demand forecasting is done at different levels

Variety	MoA	ORBA	ARBA	Zone	Woreda	Kebele	ESE	OSE	ASE	PSC*	Coops
BH660	x	x		xxx	xxx	xxxx	x	x		x	
BH661	x	x	x	xxx	xxxx	xxxx	x	x	x	xx	x
BH546		x	x	x	xxx	x	x	x	x	x	
BH547	x			x	x			x			
BH540			x	xxx	xxx	xx	x	x		xx	x
BH545			x	x							
BH549			x								
Melkasa-2	x						x	x			
Melkasa-4	x						x	x			
Melkasa-6Q	x							x			
Gibe-2	x										
AMH-760Q	x										
Hora	x										
Limu			Limu	x	xx	xxxx					
BH 670				x							
Abba raya				x							
Hooraa				xx							
BH543				x							
Jibat				x							
Wanci				x							
Argane				x							
Damot					xx						
BH140							x				

Variety	MoA	ORBA	ARBA	Zone	Woreda	Kebele	ESE	OSE	ASE	PSC*	Coops
Hawasa 1							x				
Shone					x						
Total	9	3	5	14	8	5	8	8	2	4	2

* PSC = Private Seed Companies

Note: The number of x's show the number of stakeholders making seed demand forecasting for the variety.

Blank= NA

Low intensity

High intensity

Annex 5.2: Certified Wheat Varieties

A total of 30 varieties of wheat were reported by stakeholders at different levels. The varieties of wheat for which certified seed demand is forecasted at different levels is shown in Annex Table 4.2. The most common varieties of wheat for which certified seed demand is forecasted include kekeba, dendea/danfe, ogolcho, hidase, kingbird, wane and lemu. The ESE supplies seed to wider range of agro-ecologies. Varieties such as and Ejersa are among the varieties reported by ESE but not reported by other stakeholders included in the assessment.

Annex Table 5.2: Wheat variety for which certified seed demand forecasting is made at different levels

Variety	MoA	ORBA	ARBA	Zone	Woreda	Kebele	ESE	OSE	ASE	PSC*	Coop
Kekeba	x	x	x	xx	xxxx	xxx	x	x	x	x	x
Dendea/danfe	x	x		xxx	x	x	x	x	x	x	x
Ogolcho	x	x	x	xxx	xx	xxx	x	x			x
Hidasse	x	x	x	xxx	x		x	x			
Kingbird	x	x		x			x	x			x
Digalu	x			x	x						
Hawi	x	x									
Paven-76	x	x		xx	x						
Hoggana	x			x							
Hulluqa	x	x		x			x				
Ude	x			x							
Mangudo	x	x		x	x						
Utuba	x	x									
Mandoyu	x			x				x			
Tuse	x										
Shorima	x	x		x			x				
Wane	x	x	x	xxx	x		x	x			x
Lemu		x	x	x	x		x	x			
Liben		x		xx	x						
ONQOLO		x									
Sanate		x		xx	x			x			
Kubsa				x	x						
Taate				x							
Ilani				x							
Mukiye				x							
HAR-1685				x	x						
Deeka				x	x						
Tay					x						

Variety	MoA	ORBA	ARBA	Zone	Woreda	Kebele	ESE	OSE	ASE	PSC*	Coop
Oborra								x			
Ejersa								x			
Total	17	16	5	23	15	3	9	11	2	2	5

* PSC= Private Seed Companies

Note: The number of x's show the number of stakeholders making seed demand forecasting for the variety.

Blank= NA

Low intensity

High intensity

Annex 5.3: Certified Teff Varieties

The assessment revealed that certified seed demand forecast was made for 17 varieties of teff at different levels. Annex Table 4.3 presents the list of these varieties among which the most common varieties were Cr-37, Cr-387, quncho, kora, boset, dagame and estub. As stated earlier, zonal BoA reported longer list of varieties which are not covered by other stakeholders. These could be localized varieties or not available for supply outside the zone.

Annex Table 5.3: Teff variety for which certified seed demand forecasting is made at different levels

Variety	MoA	ORBA	ARBA	Zone	Woreda	Kebele	ESE	OSE	ASE	PSC*	Coop
Cr-37	x	x		xxx	xx	xxx	x		x	x	
Quncho	x	x	x	xxx	xxxx	xx	x	x	x	xx	x
Cr-387	x										
Kora	x	x	x	x	x	xx	x	x		x	
Boset	x	x		xx	x		x	x		xx	
Dagame	x	x		x				x		xx	
Nigus		x								x	
Estub			x		xx	xxxx					x
Tseday			x					x			
DZ-01-96				x							
DZ-01-974				x							
Kenna				x							
Guduru				x							
Zuqala				x							
Gamachis				x							
Dukam				x							
Gululisa				x	x						
Total	6	6	4	13	6	4	4	5	2	6	2

* PSC= Private Seed Companies

Note: The number of x's show the number of stakeholders making seed demand forecasting for the variety.

Blank= NA

Low intensity

High intensity

Annex 5.4: Certified Barely Varieties

The assessment revealed that certified seed demand forecast was made for 29 varieties of barely at different levels. Annex Table 4.4 presents the list of these varieties among which the most common varieties were holker, traveler, and ibon. Regional difference in terms of the variety demand is apparent. Relatively more diversity of barely varieties were reported in Oromia which are demand for which are forecasted at region level by the RBoA and Oromia Seed Enterprise (the supplier of the seed).

Annex Table 5.5: Barely variety for which certified seed demand forecasting is made

Variety	MoA	ORBA	ARBA	Zone	Woreda	ESE	OSE	ASE
HB-1307	x			x		x		
Gobe	x							
Bahati	x							
HB-42	x		x					
Holker	x		x	xx	x	x	x	x
Bekoji	x			x				
EH-1847	x							
Traveler	x	x	x	xx	x		x	
Ibon	x		x	xx	x		x	
174/03	x							
Sabini	x			xx				
Faneka	x							
BH1307		x					x	
Fatima		x					x	
HB 1963		x		x			x	
Ibon-174/03		x						
HR 1307			x					
Beka				x				
Worqiye				x				
Shagge				x				
Miskal				x				
Kabbe				x				
Biftu				x				
HB-52				x				
Grace				x			x	
Abdane				xx				
Explorer				x				
Planet							x	

Variety	MoA	ORBA	ARBA	Zone	Woreda	ESE	OSE	ASE
Total	13	5	5	17	3	2	8	1

* PSC= Private Seed Companies

Note: The number of x's show the number of stakeholders making seed demand forecasting for the variety.

Blank= NA

Low intensity

High intensity

Annex 5.5: Certified Sorghum Varieties

Only five of the 9 stakeholders interviewed stated that they forecast certified seed demand for sorghum varieties. A total of 7 varieties were reported though the most commonly mentioned sorghum varieties are melkam, Abshir and gubiye (Annex Table 4.5).

Annex Table 5.5: Sorghum variety for which certified seed demand forecasting is made

Variety	MoA	ORBA	Zone	OSE	ASE
Melkam	x	x	xx	x	
Abishir	x	x	xx	x	
Gubiye	x	x	x	x	
Berihan		x	x	x	
ESH-I		x			
Mako				x	
Girana I					x
Total	3	5	4	5	1

* PSC= Private Seed Companies

Note: The number of x's show the number of stakeholders making seed demand forecasting for the variety.

Blank= NA

Low intensity

High intensity

Annex 6: Schematic Summary for EGS Demand Forecasting Process at Different Levels

Annex 6.1: Federal MoA EGS Demand Forecasting Process

Data Needs:

- Area of crop
- Seeding rate
- Variety in demand
- Volume of EGS by crop by variety and by seed producer
- Demand & supply trend of previous years' EGS
- Volume of left over EGS
- Opportunity for varietal change

Data Collection Process:

- Obtain EGS demand data from regional BoA and ESE and EIAR in Jan.-Feb annually
- Review/assess the capacity of federal EGS producers (ESE & EIAR) to respond to the submitted demand
- Evaluate previous year demand & supply performance
- Adjust the submitted EGS demand based on the capacity of federal EGS producers & previous trend
- Share back the adjusted seed demand to each regional BoA, ESE and EIAR
- Facilitate signing of contract based EGS production capacity at federal level

Data Storage:

- EGS demand is collected both in hard (signed & stamped) and soft copy

Data Compilation:

- Compile EGS demand data by region, and by crop by variety

Data Curation / QA-QC:

- Compare the demand with past trend
- Compare the demand with five-year strategic plan

Data Analyses / methodology:

- Identify and analyze capacity of EGS suppliers available at federal level
- Evaluate trend of demand & supply of EGS of previous years
- Relate to the demand to strategic five-year plan
- Adjust seed demand of each region that can be allocated from federal level

Results Generation:

- Demand for EGS by region, volume, crop and variety
- Estimated land area for EGS production
- Know the supply capacity of federal EGS suppliers, i.e., EIAR & ESE

Actions Communicated:

- Communicate to each regional BoA the volume of EGS allocable from MoA by crop and variety
- Possible re-location from region of excess to deficient regions

Actions Taken:

- Coordinate overall EGS demand and supply process through meeting & reports
- Revise EGS demand in consultation with regional BoA
- Facilitate purchase of EGS as per signed contract
- Facilitate (by sharing information & providing support letter) any excess EGS to be used by those who demand > supply
- Advise performance & past trend allocation when demand > supply
- Facilitate inter-regional sharing of EGS, including re-location as needed
- Follow up production, purchase, and distribution of EGS
- Capture farmers preferences, means of variety promotion (media, field days, demos)
- Promote off-season EGS production to minimize demand & supply gap

Results use/aggregation:

- To know the potential of the EGS suppliers to supply the demanded EGS
- To know land requirement
- To know gap between demand & supply and decide if off-season production is necessary
- To know gap between performance and five-year plan
- To make EGS allocation plan
- To inform regional BoA look for EGS from other sources
- To estimate amount of certified seed to be produced next year

Results: Communication

- Volume of EGS needed by crop, by variety and by region
- Gap between demand & supply
- Gap against strategic five-year plan

Remark (Federal MoA) for EGS:

- MoA has no role in EGS price determination, which is determined by EGS suppliers (EIAR & ESE) by adding 10-15% above the price of certified seed)
- Low technical & infrastructure capacity to digitalize seed demand collection, analysis & storage

Annex 6.2: Regional BoA EGS Demand Forecasting Process

Data Needs:

- Area under cultivation
- Variety in demand
- Seeding rate
- Volume of seed by crop by variety by seed producer
- Demand & supply trend of previous years
- Volume of left-over seed
- Opportunity for varietal change

Data Collection Process:

- Collect EGS demand from all certified seed producers in the region
- Coordinate EGS demand collection and supply in collaboration with research institutes
- Notify seed producers in the region in Dec. to submit their demand in Jan./Feb.
- Develop EGS demand collection format & share with seed producers
- Organize meeting with EGS suppliers
- Facilitate signing of contract between EGS suppliers and users

Data Storage:

- EGS demand is collected and stored mainly in hardy copy
- Increasing trend to receive in soft copy entered in Excel for storage and sharing

Data Compilation:

- Aggregate volume of EGS by crop, by variety and by seed producer in the region

Data Curation / QA-QC:

- Aggregate EGS from different seed producers
- Compare with past trend
- Make some adjustment based on development plan of BoA

Data Analyses / methodology:

- Identify and analyze capacity of EGS suppliers available at federal level
- Evaluate trend of demand & supply of EGS of previous years
- Relate to the demand to strategic five-year plan
- Adjust seed demand of each region that can be allocated from federal level

Results Generation:

- Volume of EGS demanded by crop by variety by seed producer

Actions Communicated:

- Submit the aggregate EGS data to regional seed enterprises
- Also submit to MoA for eventual allocation

Actions Taken:

- Deliver EGS demand to research institutes, public seed enterprises & certain private companies
- Follow up the seed producers, obtain the EGS demanded from nearby research centers & public seed enterprises at the time of distribution
- Allocate EGS for seed producers with CoC, when shortage exists
- Facilitate inter-regional seed sharing
- Advise EGS users to change variety for which EGS is available & having similar adaptation
- Facilitate EGS production under irrigation to minimize gap between demand and supply
- Mentor & evaluate EGS demand & supply performance for improvement
- Ensure seed quality

Results use/aggregation:

- Volume of EGS that can be supplied from within region
- Volume of EGS required from MoA through federal allocation
- Volume EGS required from other regions
- For contract EGS production
- For effective EGS production planning
- Optimize EGS demand & supply decision
- To guide EGS producers

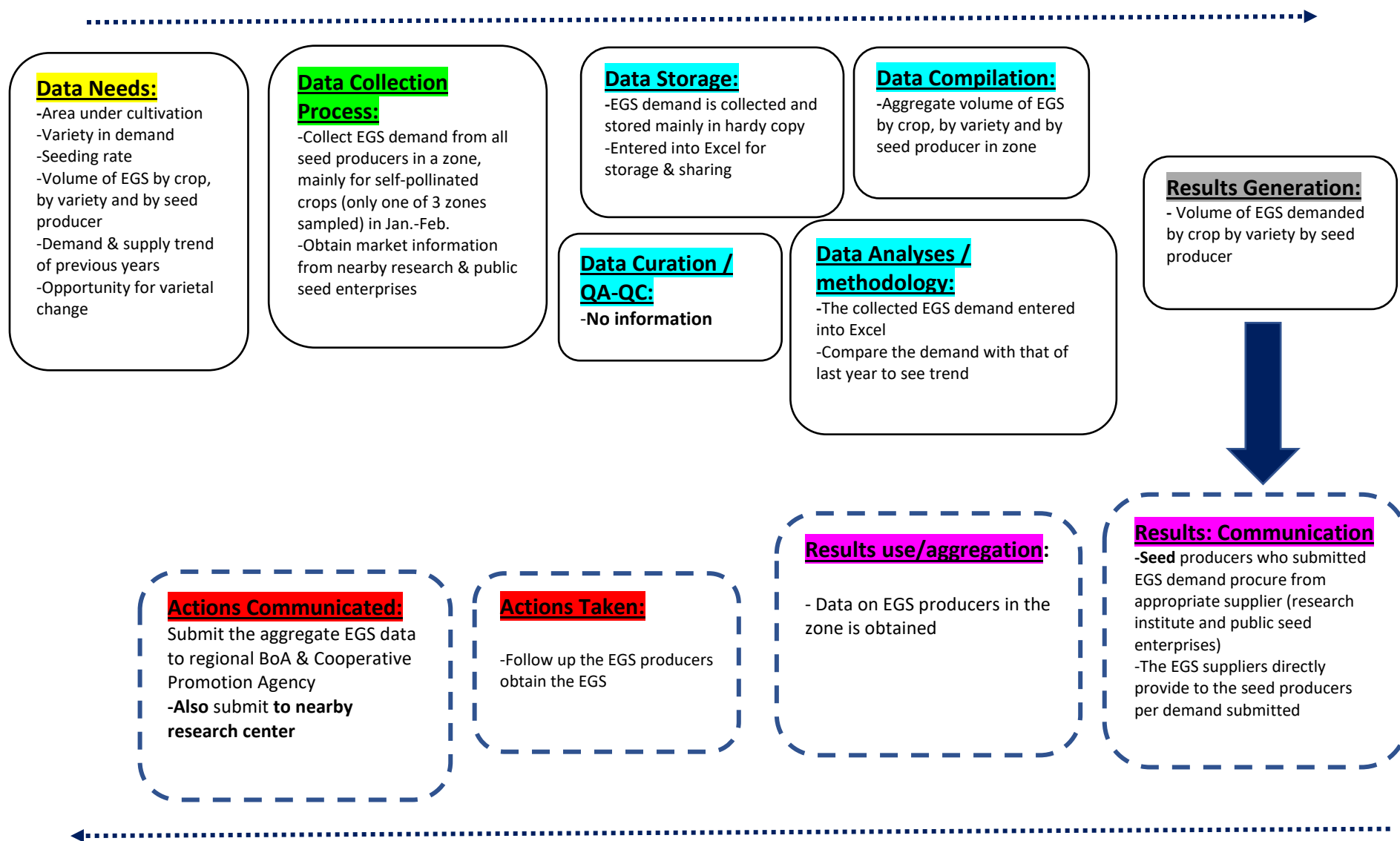
Results: Communication

- Amount of certified seed to be produced in the next season
- Potential EGS producers identified
- Volume of EGS to be produced by crop by variety

Remark (Regional BoA) for EGS:

- BoA acts as observer when contract is signed between EGS users and suppliers
- Contract based EGS production is gaining momentum
- BoA has no role in EGS price determination
- Coordination & digitalization need attention; Need for technical & infrastructure development is high

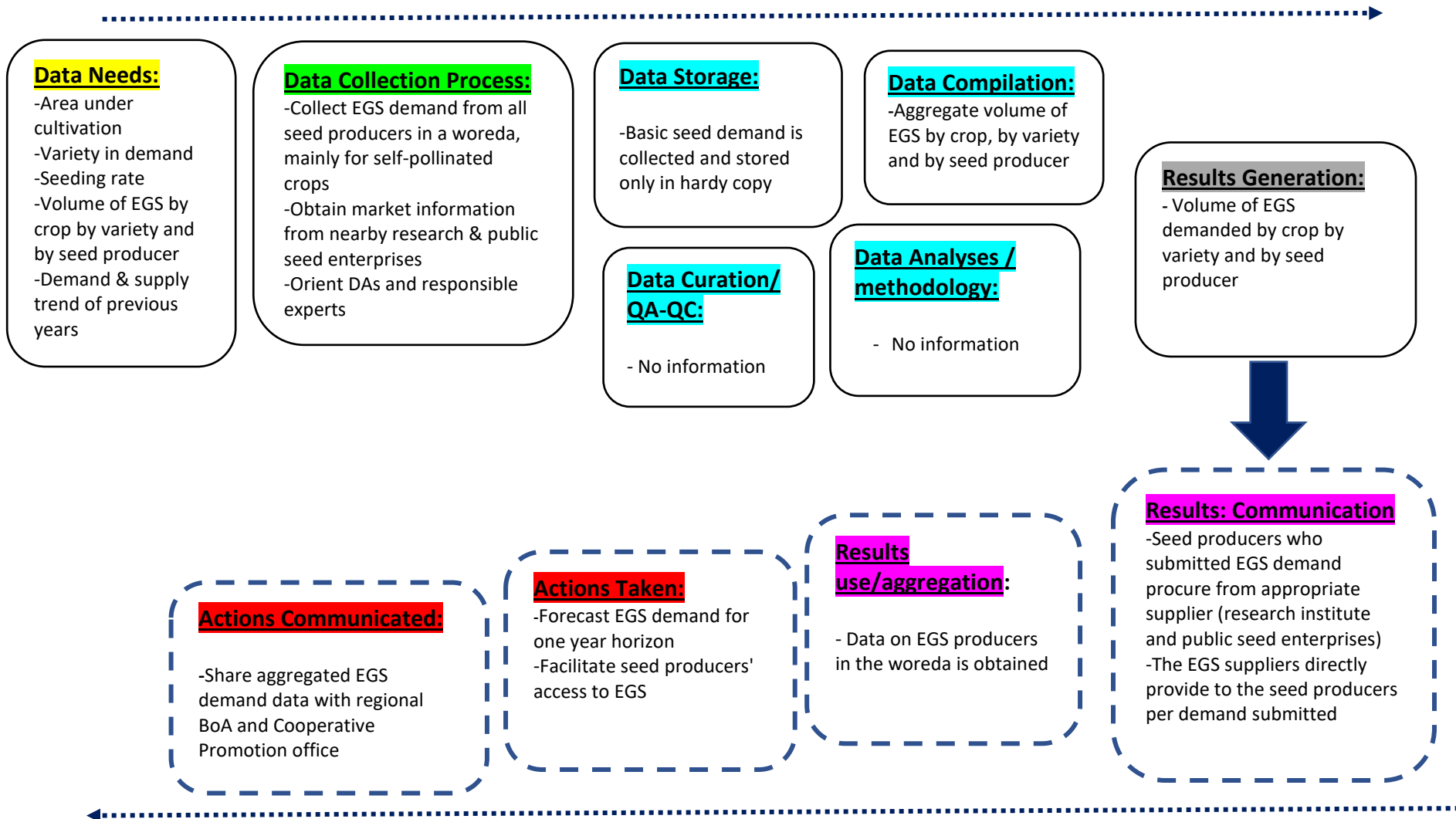
Annex 6.3: Zonal BoA EGS Demand Forecasting Process



Remark (Zonal BoA) for EGS:

-EGS is demanded by seed producer cooperatives/unions) in the zone; -Research centers determine price of EGS, adding 10-15% above the price for certified seed
 -EGS is collected mainly for wheat; -Shortage of EGS is a common challenge; Need for technical & infrastructure development is high

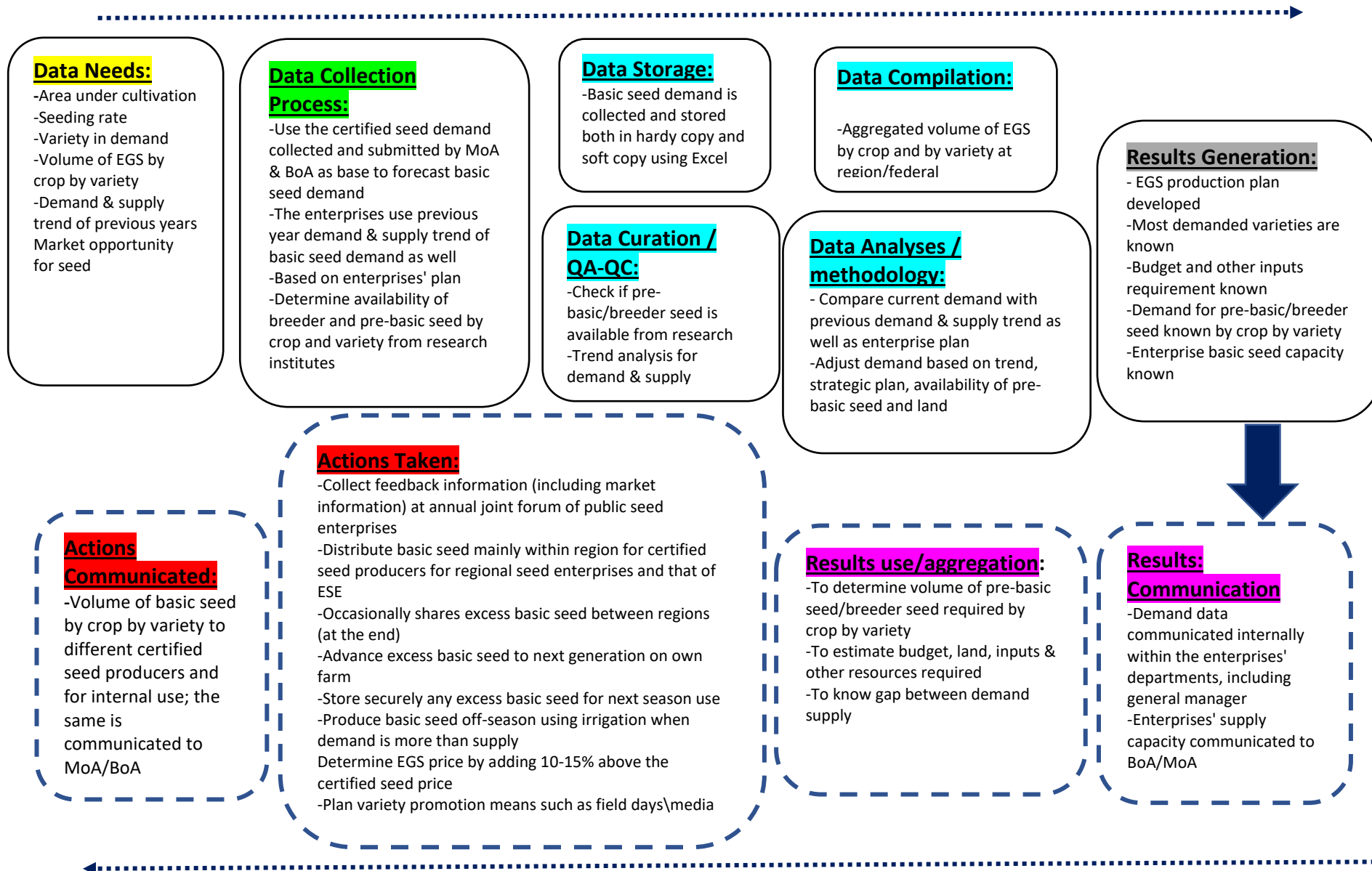
Annex 6.4: Woreda Level EGS Demand Forecasting Process



Remark (Woreda level) for EGS:

- Woreda has no role in EGS price fixation
- Shortage of EGS supply at woreda level

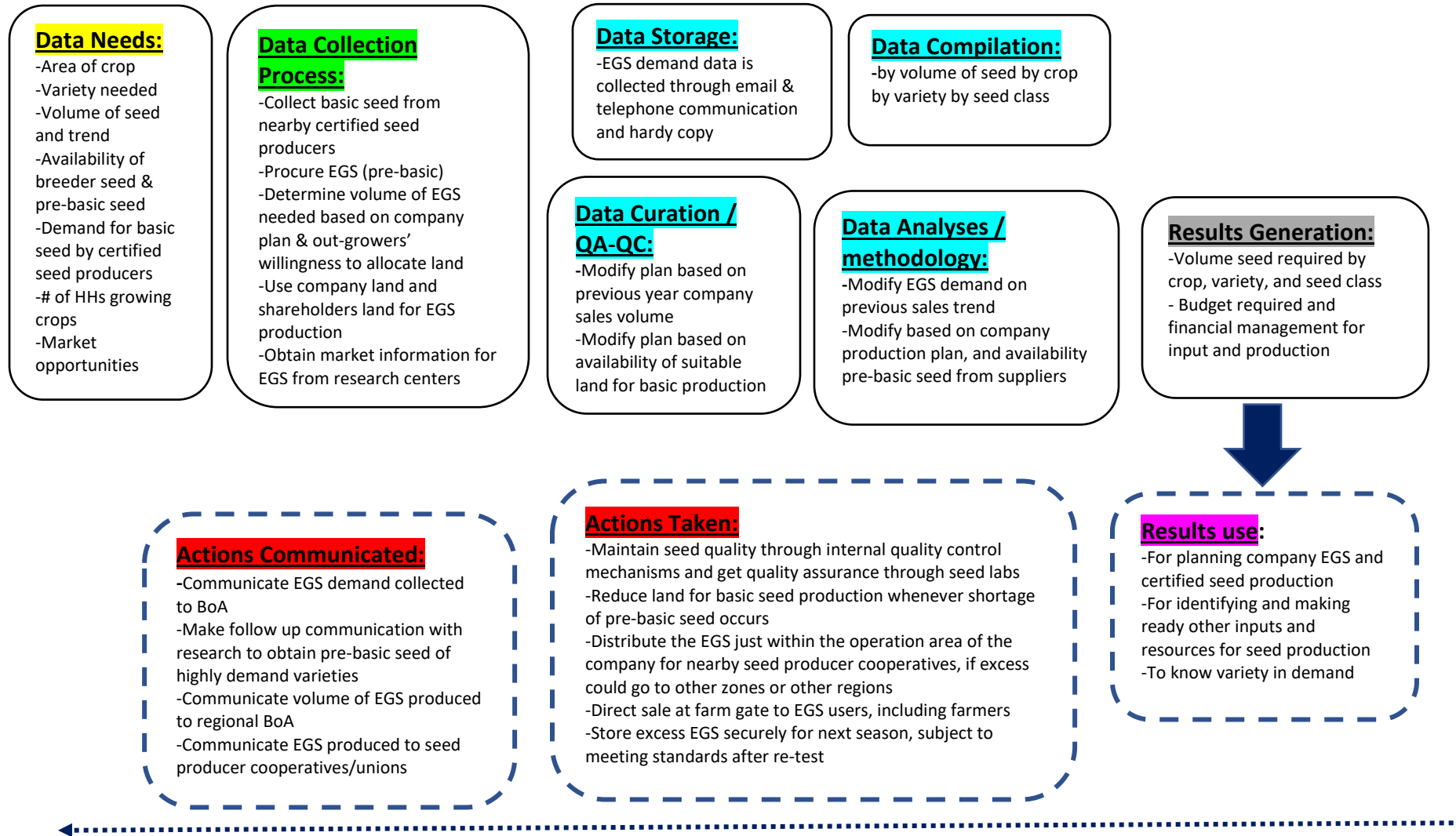
Annex 6.5: Public Seed Enterprise EGS Demand Forecasting Process



Remark (Public Seed Enterprise) for EGS:

- Public seed enterprises are mainly in charge of basic seed production, while research institutes do so for breeder and pre-basic
- EGS production is increasingly becoming demand-based and produced through contractual arrangement
- Lack of digitalization in seed demand assessment; Need for technical and infrastructure development to digitalize seed demand forecasting

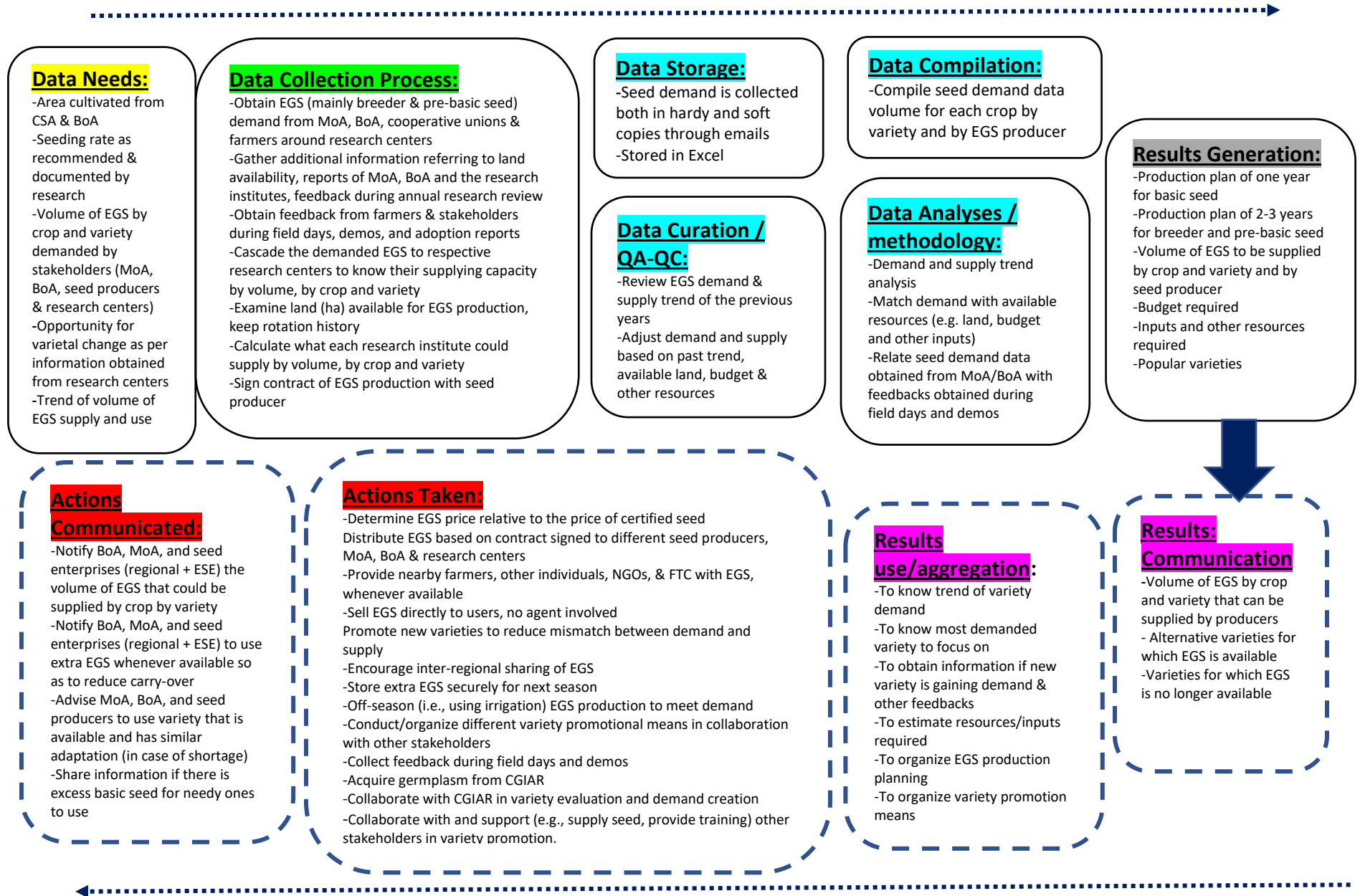
Annex 6.6: Private Seed Company EGS Demand Forecasting Process



Remark (Private Seed Companies) for EGS (tef & wheat only):

- Often quantity of EGS demanded is less than that of certified seed; EGS planning requires several years, while certified seed demand is made for one year ahead
- Companies are free to fix price of EGS, unlike that of certified seed; Limited technical and infrastructure capacity for EGS demand collection and production

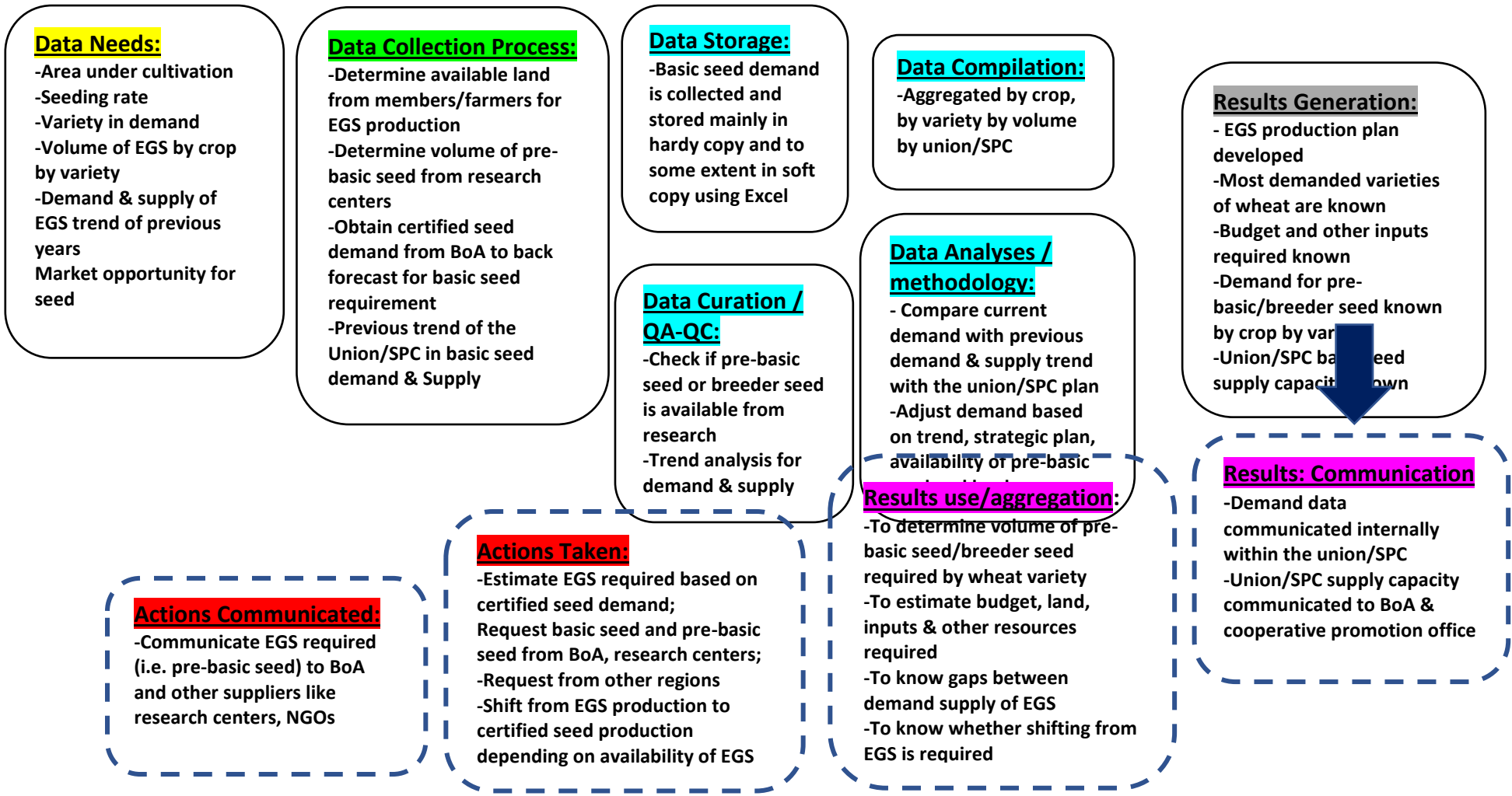
Annex 6.7: Research Institutes EGS Demand Forecasting Process



Remark (Research Institutes) for EGS:

- Increasing demand both for EGS and certified seed from time to time; and increasing supply but not yet met demand
- Improving practice of seed demand forecasting, esp. demand-based EGS production; -Increasing interest from all stakeholders to support improved seed supply (EGS & certified)
- Increasing commercial crop production, creating demand for certified seed

Annex 6.8: Cooperative Unions & SPC Level, only for Wheat EGS Demand Forecasting process



Remark (Union & SPC) for EGS:

- Basic seed demand collection and production is done only for wheat
- It accesses basic seed from public & private seed enterprises, research and NGOs

Annex 7: Varieties of Crops for which EGS Demand Forecasting is Made

Annex 7.1: EGS Maize Varieties

The results of the assessment show that a total of 35 varieties of maize are included in EGS demand assessment. However, there is diversity in the type of varieties covered by the different stakeholders. Annex Table 6.1 presents the list of these varieties and the stakeholder involved in forecasting the demand. The kebele level agriculture office and the private seed companies have not reported demand forecasting for EGS of maize varieties. Private seed companies such as Pioneer receive the parental material from abroad to produce the certified so it does not pass through the demand forecasting path presented in this report.

Annex Table 7.1: Maize variety for which EGS demand forecasting is done at different levels

Variety	MoA	ORBA	ARBA	EIAR	IQQO	ARAR	ESE	OSE	ASE
I42-I-e	x	x		x		x	x	x	
CML-395	x	x					x		
CML-161	x	x		x					
CML-165	x	x		x					
CML-197	x			x					
CML-445	x			x					
CML-440	x			x					
124b (113)	x			x			x		
SC-22	x			x			x		
BKL-I	x			x					
BKL-3	x			x					
BKL-2	x			x					
BKOOOI	x			x			x	x	
A-7033	x			x					
F-7215	x			x					
CML-202	x	x		x		x	x	x	
CML-395	x			x		x		x	
CML312	x	x		x			x		
Malkasa 2	x	x		x		x			
Malkasa 4	x			x					
Malkasa 6	x			x					
MH138Q	x			x					
Gibe 2	x			x					
BKL-001		x				x			
BKL-002		x		x				x	
BKL-003		x		x					
BH661			x		x				x
BH540			x						
BH546			x		x				x
BH545			x						
BH549			x						
CZL0814				x					
SC22/124b (109)				x					
SC22(540)				x					

Variety	MoA	ORBA	ARBA	EIAR	IQQO	ARAR	ESE	OSE	ASE
Gutto LMs				x					
Total	23	10	5	28	2	5	7	5	2

Annex 7.2: EGS Wheat Varieties

EGS demand forecasting is made for a total of 32 wheat varieties. Research institutes, public seed enterprises, MoA and regional BoA cover relative large number of varieties of wheat (Annex Table 6.2). Private sector involvement in EGS forecasting was reported only for 2 wheat varieties. The woredas agriculture office also cover only limited varieties, which are demanded and reported by seed producer groups that work with research centers.

Annex Table 7.2: Wheat variety for which EGS demand forecasting is made at different levels

Variety	MoA	ORBA	ARBA	Zone	Woreda	EIAR	IQQO	ARAR	ESE	OSE	ASE	PSC*	Coop
Kekeba	x	x	x			x			x	x	x	x	
Dendea	x	x				x			x	x	x	x	
Hawi	x	x											
Paven-76	x	x		x									
Hoggana	x					x							
Hidase	x	x	x	x	x	x			x	x			
Hulluqa	x	x				x			x				
King barid	x	x				x	x	x	x	x			x
Utuba	x	x				x							
Mandoyu	x						x	x		x			
Daka	x				x				x				
mangudo	x	x				x							
Ogolcho	x	x	x	x	x	x			x	x			x
Shorma	x	x				x			x				
Wane	x	x	x	x		x			x	x			
Limu	x	x	x			x			x	x			
Kubsa		x											
Liben		x					x	x					
Onkolo		x											
Sanate		x					x	x		x			
Taye		x											
Oborra							x	x		x			
Ejersa							x	x		x			
Hacalu							x	x					
Dambal							x	x					
Sofumer							x	x					
Bakalcha							x	x					
Bulalala							x	x					
Dire							x	x					
Obsa							x	x					
Toltu							x	x					
Ude						x							
Total	16	18	5	4	3	13	14	14	10	11	2	2	2

* PSC= Private Seed Companies

Annex 7.3: EGS Teff Varieties

EGS forecasting was made for a total of 14 teff varieties. Bosat, kora, kuncho, Cr-37 and dagim varieties are the most commonly covered by different stakeholders. In this case, the private seed companies also covered more teff varieties in the EGS demand forecast as compared to the other crops. Annex Table 6.3 presents the list of varieties of teff for which EGS demand is forecasted and the stakeholders involved.

Annex Table 7.3: Teff variety for which EGS demand forecasting is made at different levels

Variety	MoA	ORBA	ARBA	EIAR	IQQO	ARAR	ESE	OSE	ASE	PSC*	Coops
Kora	x	x	x	x				x			
Kuncho	x	x	x	x			x	x	x	x	
Cr-37	x	x		x			x		x		
Bosat	x	x		x	x	x	x	x		x	
Dagim	x	x		x			x	x		xx	
Estub			x								
Tseday			x					x			
Nigus				x			x			x	
Tesfa							x				
Guduru					x	x					
Kenna					x	x					
Dursa					x	x					
Cr-387				x							
Real 120										x	
Total	5	5	4	7	4	4	6	5	2	5	

* PSC= Private Seed Companies

Annex 7.4: EGS of Barely Varieties

Among the 25 varieties of barely for which EGS demand is forecasted, HB-1307 and Holker are covered by many stakeholders. As shown in Annex Table 6.4, the varieties for which demand was forecasted vary among the stakeholders.

Annex Table 7.4: Barely variety for which EGS demand forecasting is made

Variety	MoA	ORBA	ARBA	Zone	EIAR	IQQO	ARAR	ESE	OSE	ASE
HB-1307	x				x	x	x	x	x	
Gobe	x									
Holker	x		x		x			x	x	x
Bokoji	x				x					
Bahati	x				x					
HB-42	x		x							
Faneka	x				x					
Sabini	x				x					
Agegnehu	x									
ES-1847	x									
Ebon-174	x	x			x					
EH 1847	x							x		
cross 41/98	x									
HB 1963		x						x	x	
Traveler		x	x						x	
BH 1370		x								
HR 1307			x							
Ibon			x	x					x	
Planet									x	
Fatima									x	
Grace									x	
Mo'ata						x	x			
Singitan						x	x			
Abdane						x	x			
Adoshe						x	x			
Total	13	4	5	1	7	5	5	4	8	1

Annex 7.5: EGS Sorghum Varieties

From the 12 sorghum varieties for which EGS demand was estimated, MoA reported to include only 50% of them in the national EGS demand estimate while Oromia BoA covered only one. The majority of the sorghum varieties were recorded at research institutes (Annex Table 6.5).

Annex Table 7.5: Sorghum variety for which EGS demand forecasting is made

Variety	MoA	ORBA	EIAR	IQQO	ARAR	ESE	OSE	ASE
Gubbiyee	x		x	x	x		x	
Abshir	x		x				x	
Melkam	x	x	x	x	x	x	x	
ESH-I	x							
Meko	x						x	
Dhekaba	x			x	x			
Berhan							x	
Girana I								x
Elemo				x	x			
Fadis 01				x	x			
Chemeda				x	x			
Gamadi				x	x			
Total	6	1	3	7	7	1	5	1

Annex 8: Awareness Creation by different Stakeholders at Different Levels

Annex 8.1: Extension and Awareness Creation by Seed Producers

Activity	Kebele	Woreda	Zone	Public Seed Enterprise	Private Seed Companies	Cooperatives
Organizing promotional forum/means	Often	Often	Often	Often	Rarely	Not applicable
Participation on promotional events organized by others	Often	Often	Often	Often	Often	Often
Co-organizing promotional forum	Often	Often	Often	Rarely	Rarely	Rarely
Use media	Often	Often	Often	Often	Rarely	Not applicable
Field day	Often	Often	Often	Often	Rarely	Often
Collect feedback from farmers	Often	Often	Rarely	Often	Often	Often
Design or guide promotional activities to reach women	Rarely	Rarely	Not applicable	Often	Often	Often
Design or guide promotional activities to reach youth	Rarely	Not applicable	Not applicable	Often	Often	Often
Design or guide promotional activities to reach people with disability	Not applicable	Not applicable	Not applicable	Often	Often	Often

Not applicable Null Rarely Sometimes Often Always

Annex 8.2: Awareness Creation Methods by Different Actors responded at Zone Level

Activity	Research centers	University	Development projects	Government	NGOs	Coops/ union	Public seed enterprises	Other input providers	Private seed companies	SMS	DAs	Farmers
C1.1 Demonstration	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often
C1.2 Field Day	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often
C1.3 Participatory variety evaluation/selection	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often
C1.4 Advertisement on media (radio, TV)	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often
C1.5 Seed company billboard	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often
C1.6 Seed company wears	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often
C1.7 Seed fairs	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often
C1.8 SMS text	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often
C1.9 Deliver seeds of new varieties in small pack	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often
C1.10 Web sites	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often
C1.11 WhatsApp groups	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often	Often

Not applicable Null Rarely Sometimes Often Always

Annex 8.3: Awareness Creation Methods by Different Actors Responded at Woreda Level

Activity	Research centers	University	Development projects	Government	NGOs	Coops/ union	Public seed enterprises	Other input providers	Private seed companies	SMS	DAs	Farmers
C1.1 Demonstration												
C1.2 Field Day												
C1.3 Participatory variety evaluation/selection												
C1.4 Advertisement on media (radio, TV)												
C1.5 Seed company billboard												
C1.6 Seed company wears												
C1.7 Seed fairs & exhibitions												
C1.8 SMS text												
C1.9 Deliver seeds of new varieties in small pack												
C1.10 Web sites												
C1.11 WhatsApp groups												
Not applicable	Null	Rarely	Sometimes	Often	Always							

Annex 8.4: Awareness Creation Methods by Different Actors Responded at Kebele Level

Activity	Research centers	University	Development projects	Government	NGOs	Coops/ union	Public seed enterprises	Other input providers	Private seed companies	SMS	DAs	Farmers
C1.1 Demonstration												
C1.2 Field Day												
C1.3 Participatory variety evaluation/selection												
C1.4 Advertisement on media (radio, TV)												
C1.5 Seed company billboard												
C1.6 Seed company wears												
C1.7 Seed fairs & exhibitions												
C1.8 SMS text												
C1.9 Deliver seeds of new varieties in small pack												
C1.10 Web sites												
C1.11 WhatsApp groups												
Not applicable	Null	Rarely	Sometimes	Often	Always							

Annex 9: Strengths of the Seed Demand Forecasting System

Category	Kebele	Woreda	Zone	BOA	MOA	COOP	Public seed enterprises	private seed company
Capacity to assess demand	Annual orientation on seed demand by woreda makes the process clear; Presence of support from kebele development team for seed demand collection; Collect demand directly from all farmers (census), in every kebele every year on time; Prior understanding of farmers seed demand; All farmers contacted either at their home or when they gathering/at meeting; Identification of specific areas for variety suitability (i.e., agro-ecological adaptation)	House to house seed demand assessment from farmers in all kebeles; Timely seed demand assessment & reporting; Basic knowledge on seed demand assessment techniques;	Timely seed demand assessment practice; Addressing all woredas within each zone; Bottom-up approach for seed demand assessment; Demand assessed for many crop varieties as much as possible; Verification of the collected and submitted data by input coordination unit (ICU); Analyze seed distribution trend	The process of seed demand collection is bottom up; Seed demand collection and compilation as well as updating data are well coordinated from kebele level up through woreda and zone; Rich experiences and skills developed to make seed demand adjustment, including within and inter-regional re-location of seed to make good use of it and reduce carry-over seed based on previous trend; Strong coordination and frequent communication among actors helping seed allocation and re-location within and between regions; Increased demonstration of new varieties by research, universities and	Continuous support of the MOA to regional BOAs; Frequent information exchange trend during seed distribution; Timely seed demand collection and sharing for respective institutions; Bottom-up approach for seed demand collection; Timetable for seed demand collection at national level;	The union is not engaged in EGS demand forecasting yet; Only estimate EGS need based on certified seed demand; Collaboration with zonal cooperative promotion agency and BOA, though we are not working seed demand forecasting as the main activity of the SPC and cooperative union; The forecasting by woreda, zonal and regional BoA is adequate enough in most instances, though mismatch between demand and supply occurs sometimes; Certain unions (Hetosa Union) is much involved in seed demand forecasting, timely seed collection from its member	Well accumulated experiences by certain enterprises like ESE; Linkage with own branch farmers and other stakeholders; Well accumulated experiences by certain enterprises like ESE; Increasing tendency to collect feedback, information, and seed demand, so as to understand preference of farmers; Increasing alignment of own production plan with that of BoA and MoA; validate and verify	Timely collect the EGS demand; Share timely the results of the EGS demand data with the respective company's management team and eventually regional BOA; Strongly look for EGS of most demanded varieties at appropriate the research centers; Timely collect the certified seed demand; Own built experience is used in demand forecasting twice a year; Agents and contact farmers used as the certified seed demand information sources Timely share the results of the certified seed demand data with company's management team & BOA; Conducting field day during which farmers feedback is collected

Category	Kebele	Woreda	Zone	BOA	MOA	COOP	Public seed enterprises	private seed company
				development projects;		primary cooperatives and hence timely distribution;		
Infrastructure and digital technology needed for seed forecasting	Basic knowledge of using computer; DAs have some basic skill of using IT; No digitalization	Basic computer utilization skills, i.e., experts are familiar with the use of IT and able to do computer data compilation	Availability of desktop computer in the office and use skill, helping data entry, processing, and storage; Basic computer utilization skills					
Seed production	Potential land is available for more amount of seed production (out-grower scheme); more farmers involved in seed production; Throughout grower scheme (clustered land for seed production); hence increased access to seed; increased support from seed producers to such farmers; Training provided for seed producer farmers; Existence of youth seed producer groups; seed producer cooperatives in some kebeles; Large number of varieties for wheat crops available; Seed production is mechanized in some sampled kebeles	Cluster based seed production practice and supporting such producers to obtain basic seed; Existence of many seed producer cooperatives, which are being supported in quality seed production – pre-harvest and post-harvest support provided by woreda BoA & DAs; Development partners continuous support; Woreda BoA provides close and continuous technical support for farmers; Facilitation of timely seed supply	Many crops addressed; Increasing trend in seed production volume and kind; Hence, increasing use of seed by farmers; Cluster oriented seed production practice; Well trained and organized seed producer cooperatives in technical aspects of crop husbandry, seed production and management; Existence of many experienced seed producers; Presence seed labs for seed quality assurance through inspection, testing & certification; More or less mechanized	Regions are making good progress to be self-sufficient to meet the regional seed demand.			Use of out-grower schemes; Maintain EGS quality for more than one season; Increasing trend to meet demand	
Seed distribution	Reduced seed left-over because of efficient distribution (e.g., DSM & agents involved); Provide	Presence of alternative seed marketing channel such as DSM; Presence of many agents engaged in	Many actors engaged/interested in the seed sector; Presence of alternative marketing strategy such as DSM which is efficient & timely		Promoting seed agents in seed distribution; Distribution of seeds			Strong follow up to supply seeds of demanded varieties

Category	Kebele	Woreda	Zone	BOA	MOA	COOP	Public seed enterprises	private seed company
	information to seed distributors and micro-finance institutions; strong follow up by woreda BoA; Multiple seed suppliers, providing options and competition, esp. for maize; Existence of seed agents in most potential woredas; Price difference whenever there is DSM; Seed deliver in small seed packs (certain kebeles in Amhara)	seed distribution; Strong follow up on seed distribution to ensure adequate distribution & resolve any conflict that may arise; Pushing seed sellers to open seed selling the whole day, including weekends; Facilitate re-location of seed from excess kebele to where shortage exists	in distributing quality seed; and it is covering more and more woredas Operationalization of DSM as an alternative seed marketing model in which producers take an active role in the distribution of seed through multiple channels; Existence of many emerging seed agents		through various channels			
Price of seeds	Seed price information is rapidly disseminated to farmers; posted in the store of the agents/agro-dealers; Competitive seed pricing for hybrid maize seed; More seed price than for grain	Experience in market assessment for setting seed price; Sharing of seed price information to different actors	Presence of alternative seed prices for the same variety between producers (esp. for maize under DSM; Determination of price based on cost of production & additional costs					
Role of institutional buyers (such as government, NGOs)	They often purchase seed when it is excess; Provision of technical and financial assistance; Certain NGOs support community-based production and distribution; Used as alternative seed marketing channel; Woreda BoA follow up seed distribution; relocate seed from	Purchasing EGS for seed producer cooperatives when there is excess supply	Participation in purchase of seed for farmers; Reducing trend of government interference					

Category	Kebele	Woreda	Zone	BOA	MOA	COOP	Public seed enterprises	private seed company
	area of high supply to area of low supply; Provide feedback concerning seed price, supply & demand as well as other challenges; Purchase seed from seed producers, when supply is excess							
Role of informal seed system actors	Addressing many orphan crops; Addressing unaddressed areas; Injection of new varieties into the production system; Most seed comes from the informal sources; Provide capacity building, such as better seed storage	Injection of new/improved crop varieties; Distribution of seeds of many crop varieties to different agro-climates; Reach unaddressed remote and inaccessible areas, including neglected crops and varieties; Potential seed source for smallholder farmers	Injection of new/improved crop varieties; Distribution of seeds of many crop varieties to different agro-climates; Reach unaddressed remote and inaccessible areas; Maintain indigenous knowledge & skill; Help to reach unaddressed/remote or less accessible areas					
Role of markets where seed is sold/purchased	Sources of seed for traditional/orphan crops; create accessibility to get new varieties; Grain is used as seed whenever shortage exists; Serve as alternative seed source; Easily accessible; Re-locate seed from area of excess to area of deficit; DSM promotes timely seed distributing	Used as source of seed market information	Grain purchased as potential seed' which helps also in farmers interaction; Relatively better price for seed than grain					
Role of agricultural research institutions in	Provision of technical training for SPCs & model farmers on seed	Provision of starter seed; Work adaptation trial on farmers field	Training provided on quality seed production techniques; Continuous support for seed producer					

Category	Kebele	Woreda	Zone	BOA	MOA	COOP	Public seed enterprises	private seed company
EGS and certified seeds' production and distribution (if any)	production practices; Closely work with SPCs and selected farmers, using many crops & varieties; Provide new improved varieties and do demonstration of such varieties; Provide seeds of the demonstrated varieties to farmers	before EGS multiplication to create awareness on new varieties; Continuous support for seed producer cooperatives on seed multiplication; Continuously supply of some amount of EGS for seed producers linked to them; Joint variety demonstration	cooperatives on seed multiplication; Continuously engaged in egs seed distribution in the zone mainly through seed producer cooperatives and model farmers; Well organized in filling agro-ecologies, crops and varieties gap unaddressed by the public seed enterprises and unions; Professional staffs at all disciplines					
Knowledge dissemination and capacity building of male farmers	Increased farmers' skill in seed production in most kebeles; improved extension support for such farmers; Skilled DAs in knowledge dissemination for farmers; Demonstration site –FTC; On spot capacity building training for farmers; Provide leaflet to farmers; Provide training in community development through mass education	Existence of DAs at all kebeles for sustainable knowledge dissemination through training, demonstration & field days for awareness creation; Presence of FTCs at kebele level; Package training for all farmers about production & management	Research centers mostly conduct participatory variety selection; Presence of training programs for male and female farmers to create awareness on new varieties; Presence of DAs at all kebele levels for sustainable knowledge dissemination by informal communication through peer farmers; Presence of FTCs at kebele level					
Knowledge dissemination and capacity building of female farmers	Increased participation of women; Increased extension service; Skilled DAs in knowledge dissemination for farmers; Demonstration site –FTC; On spot capacity building training for	Existence of DAs at all kebele levels for sustainable knowledge dissemination; Presence of FTCs at kebele level; Package training for all farmers about production & management	Presence of FTCs at kebele level; Presence of DAs at all kebele levels for sustainable knowledge dissemination; Presence of training programs for male and female farmers; Dissemination by informal communication through peer farmers					

Category	Kebele	Woreda	Zone	BOA	MOA	COOP	Public seed enterprises	private seed company
	farmers; Provide training in community development though mass education							
Knowledge dissemination and capacity building of youth farmers	DA share some knowledge to youth farmers (if they have land) on FTCs; Provide leaflet to farmers; Provide training in community development though mass education;	Existence of DAs at all Kebele levels for sustainable knowledge dissemination through training, demonstration and field days; Presence of functional FTCs at kebele level for training and demonstration; Awareness creation training for; Youths organized on agriculture	Presence of training programs for male and female farmers; Presence of DAs at all kebele levels for sustainable knowledge dissemination through extension service; Presence of informal communication through peer farmers (word-of-mouth); Presence of FTCs at kebele level for demonstration					
Knowledge dissemination and capacity building of farmers with disabilities	Presence of DA at kebele level to give information on seed	Presence of DAs at all kebele levels for sustainable knowledge dissemination; Presence of FTCs at kebele level	Presence of FTCs at all kebele level for demonstration; Presence of DAs at all kebeles to provide extension service; Presence of training programs for male and female farmers; Presence of das at all Kebele levels for sustainable knowledge dissemination by informal communication through peer farmers					

Annex 10: Weaknesses of the Seed Demand Forecasting System

	Category	Kebele	Woreda	Zone	BOA	MOA	COOP	Public seed enterprises	private seed company
D1	Capacity to assess demand	The gap between demand and supply exists every year; farmers demand often not met; Limited support from woreda BoA; Lack of realistic data; poor rechecking & validation/verification of	Certain DAs compile seed demand simply from past records, i.e. desk work demand collection; Inconsistent seed demand assessment;	Limited involvement in seed demand collection due to limited technical knowledge and skill on demand data processing and interpretation; Participate only on data aggregation; Lack of accurate seed	Lack adequate time series seed demand and supply to help trend analysis and use; Low level of reliability in collected seed demand; Frequent	Inability to gather more accurate demand information; Weak technical capacity in	Unable to identify customers need; we simply produce what is adapted to our ecology; Slow decision-making	Mostly depend on data gathered by BoA from seed producers and that of MoA; Lack of digital data collection, sharing and archiving system; Less focus on demand forecasting compared to	Limited knowledge, skill and experience in EGS demand data collection; it is at infant stage; Lack of awareness on the common factors to be considered during

	Category	Kebele	Woreda	Zone	BOA	MOA	COOP	Public seed enterprises	private seed company
		data; data collection from every farmer is boring; Farmers who did not submit their demand compete with those who have registered their demand; often the former types come first and purchase, creating shortage for those registered demand; Undeveloped seed demand forecasting capacity; Limited knowledge & skill in seed demand forecasting; No system trace back who registered demand or not	Limited skill on seed demand assessment techniques; Depend on DAs only; Take into consideration few variables in seed demand data collection	demand estimation; Inadequate seed demand assessment from users; Lack of validation mechanism for checking seed demand data accuracy; Limited demand creation and hence farmers are often not well informed about the potentially available varieties	demand shift by farmers and lack of coping with	data processing and interpretation; Seed demand data is mostly kept on personnel laptop computers; The seed demand data is inaccessible; Weak in fake seed control; Inability to plan better with the given forecasting	process by the board of the unions and management of the SPC; Mismatch between demand and supply occurs sometimes; Dependency on zonal cooperative promotion agency for seed demand assessment; Lack of experience in seed demand forecasting	production; and dependency on experiences/trends; Mostly depends on data gathered by BoA and MoA which is less reliable; Lacks digital data collection, sharing and archiving system Weak internal sample survey team to collect demand by the enterprises; Weak demand creation through diverse promotional means	seed demand forecasting; Limited information is collected to use for certified seed demand forecasting; Limited /no use of BOA / MoA demand data at least as a reference; No own R&D to develop own variety
D2	Infrastructure and digital technology needed for seed forecasting	Lack of computer-based seed demand collection, i.e., no digitalization; Lack of awareness on the use of digital technology for seed demand forecasting;	Lack of seed demand estimation tools, such as digital seed demand collection, processing, and storage; Limited technical capacity to process data using different software tools 6; Limited to paper based seed demand collection which is boring; Not able to meet demand often	limitation of technological tools used for demand forecasting such as digitalization; Limited technical capacity to process data using different software tools; Inadequate personnel laptops; Lack of awareness on the importance of seed demand forecasting using digital technology; Shortage of laptop computers for individual use	Seed demand collection and archiving is not yet digitalized, limiting efficiency of data updating and sharing; Limited capacity (technical, infrastructure like ICT and market structures, finance) to coordinate seed demand collection, planning production, marketing and distribution as well as quality control, implying predominantly subjective way of seed demand collection, allocation and distribution				Weak documentation system for seed demand data; Limited seed processing plant; Lack of storage structures
D3	Seed production	Limited availability of basic seed in the seed production chain, leading to shortage of certified	Inadequate EGS supply; Inconsistent seed production pattern in the	Weak internal seed quality control system; Limited availability of early generation seed; Unable to					Limited land for seed production

	Category	Kebele	Woreda	Zone	BOA	MOA	COOP	Public seed enterprises	private seed company
		seed; Inadequate seed extension services; DAS do not get adequate training; Limited use of new technologies, including mechanization; Limited crop rotation; Limited market for self-pollinated varieties; Presence of diseases; Lack of seed producers in some kebeles; adaptability; Mismatch b/n seed supplied and farmers' preferences in some cases	woreda; Slow adoption of new varieties; Weak internal seed quality control system by seed producers; Inadequate seed extension services; Weak integration among actors; Inefficient seed producer cooperatives in certain woredas; Limited awareness creation methods on the new varieties for farmers; Limited certified seed production;	meet demand by volume & kind; Low capacity and capability of seed producers; Low shelf life of wheat varieties due to disease pressure; Low private sector participation; Seed production (volume & kind) does not satisfy farmers' demand; Shortage of basic seed; Limited capacity for seed quality control and assurance; Limited knowledge & skill in seed demand forecasting; Inadequate seed extension services; Limited irrigation facilities; Limited capacity in post-harvest seed handling; Inefficient out-grower management by seed producers; Limited mechanization					
D4	Seed distribution	Limited monitoring & evaluation system; agents are less supervised; Concentrated seasonal selling period; Low market knowledge; limited capacity building training; Undeveloped seed distribution system; Limited number of varieties; DSM is only for limited crops (e.g. maize & wheat); Late delivery seed, esp. for self-pollinated crops like wheat & teff; Late notification of seed price from woreda, zonal and regional BoA, contributed to delayed seed marketing; Limited completion based on quality and proximity to deliver/sales points; Limited seed promotion; Limited credit for seed	DSM is limited to few crops; Ineffective seed distribution coordination, often delay in seed distribution; Agents limited awareness on seed business; Limited capacity of agents for seed distribution; Some seed agents are not loyal/honest; Some seed sellers do not open seed shops the whole day, including weekends, though buyers come; Some fraud occurs at the time when supply is less than demand for most preferred varieties;	Inefficient seed distribution mechanism and lack of reliable distribution network; Some seed producers (e.g. maize) informally; Weak follow up during seed distribution; Lack of competitive seed distribution system among seed producers; Low accountability for seed quality deterioration; Lack of credit facilities for distributors; DSM is limited to few crops; Lack of distribution of certified seeds based on demand assessment; Delayed seed processing and delivery by seed producers; Marketing agents lack incentives to effectively measure demand; Poor transportation network;					

	Category	Kebele	Woreda	Zone	BOA	MOA	COOP	Public seed enterprises	private seed company
		purchase; Fraud whenever shortage in supply exists;							
D5	Price of seeds	Unfair seed price: often increase from to time & farmers complain; Price is not quality based; Close seed price to grain price; Inadequate seed market information; Kebele/DA has no stake in seed price setting; Fraud, esp. whenever shortage exists	Limited role of woreda BoA in seed price setting, though farmers complain about high seed price. Even then, farmers are willing to pay for seeds of preferred varieties; Inadequate seed market information; Lack of transparency on price setting by seed producers; Lack of common seed pricing procedures to be followed by all seed producers; Seed selling price is often not communicated to the woredas on time, delaying seed selling in the woreda;	Price determination is not inclusive; High seed price, esp. by those selling informally by not declaring what they have produced (contraband); Unfair price increase by some agents; No standardized seed pricing mechanism to be followed by all seed producers; Unreasonable farmer price expectation; Lack of clarity on price setting by seed producers; There is no system to check whether the seed price claimed by the seed producers is fair or not; Narrow seed to grain price ratio; Lack of adequate seed market information;					
D6	Role of institutional buyers (such as government, NGOs)	They are not sustainable; they are temporary; Inconsistent involvement and often weak; Limited logistics to move seed from one kebele to another within the woreda; Limited documentation system	Limited interest to collaborate with woreda BOA; NGOs have limited involvement in sampled woredas;	No involvement of Zone in planning demonstration by NGOs; Documentation is lacking; Lacks transparency during purchase; Limited integration;					
D7.	Role of informal seed system actors	Less accountability; Less focus on quality; Less varietal purity & physical quality; Limited documentation of amount of seed distributed informal;	Limited linkage with formal seed system actors; Limited seed exchange documentation; In most cases, no consideration is given to informal seed system by the woreda BoA;	Poor information exchange on the seeds distributed; Poor distinction between grain and seed among farmers in the informal sector; Limited attention for seed quality improvement at all levels; Farmers lack adequate knowledge in best seed selection techniques; Farmers re-use seed for many seasons/years before re-purchasing quality seeds of improved varieties [i.e.,					

	Category	Kebele	Woreda	Zone	BOA	MOA	COOP	Public seed enterprises	private seed company
				infrequent seed replacement rate and varietal change					
D8	Role of markets where seed is sold/purchased	Limited infrastructure (e.g., store to keep quality); Not linked to formal system; Long seed replacement rate/period; Mixed market for seed and grain; Seed/grain market is not well developed & recognized; not separate from each other	Inadequate seed market information; Mixed market for grain & seed;	No separate market for seed/grain market; Usually remote; Limited local market					
D9	Role of agricultural research institutions in EGS and certified seeds' production and distribution (if any)	Inadequate quantities of EGS production and supply; Loose integration between the research centers, BoA and the DAs; Inability to meet farmers increasing demand for more outstanding varieties; No EGS production off-season; Limited involvement in all kebeles; limited collaboration with DAs;	Inadequate quantities of EGS production and supply; Loose integration between the research and the woreda BOA; limited feedback exchange; Often the same training is given year after year; no change and less practical oriented; Large number of farmers called for training; Low supply of EGS	Inadequate quantities of EGS production and supply; Loose integration [alignment] between the research and the zonal BOA; No engagement in off-season EGS multiplication to alleviate the current supply shortfall in pre-basic and basic seed					
D10	Knowledge dissemination and capacity building of male farmers	Lack of sustainable and demand-based capacity building activities for farmers including male farmers; Limited attention to farmer's needs; Training large number of farmers at the same time; Limited techniques of knowledge dissemination are in use; Lack of female targeted capacity building	Lack of sustainable and demand-based capacity building activities for males; Limited attention to farmer's needs; Often the same training is given year after year; no change and less practical oriented; Large number of farmers called for training; Low supply of EGS; Poor knowledge management; Inadequate plan for youth capacity building;	Research centers are reaching out only small number of farmers so inadequate opinion of many farmers; Lack of sustainable and demand-based capacity building activities for males; Limited attention to farmer's needs; Limited need-based trainings; Project fund dependent trainings; Poor knowledge/information and data documentation system					

	Category	Kebele	Woreda	Zone	BOA	MOA	COOP	Public seed enterprises	private seed company
D1 1	Knowledge dissemination and capacity building of female farmers	Lack of female targeted knowledge dissemination techniques; Training large number of farmers at the same time; Limited knowledge management & transfer; Limited access to information/extension;	Lack of female targeted and need based capacity building activities; Limited attention to farmer's needs; Often the same training is given year after year; no change and less practical oriented; Large number of farmers called for training; Poor knowledge management; Limited plan for capacity building by gender category;	Lack of female targeted/specific and need based capacity building activities, i.e., limited need-based training; Limited attention to farmer's needs; Lack of practical action plan that target female capacity building; Access to and use of extension services and market information; No well-designed awareness creation tools; Mainly project fund dependent trainings; Poor knowledge/information and data documentation system;					
D1 2	Knowledge dissemination and capacity building of youth farmers	Limited attention for youth capacity building; no special attention; Training large number of farmers at the same time; Limited knowledge management & transfer/dissemination system;	Limited attention to youth farmer's needs, such as capacity building (no special consideration as such); Limited availability of youth disaggregated data for use; Poor knowledge management; Inadequate plan for capacity building for youth;	Limited attention to youth farmer's needs; Lack of action plan that target female capacity building; Limited availability of youth disaggregated data for use; Lack of well-designed awareness creation tools					
D1 3	Knowledge dissemination and capacity building of farmers with disabilities	Lack of information on disabled farmers; Less attention for capacity building for disabled farmers; No documented information; Limited attention to disabled farmers' needs	Limited attention to disabled farmer's needs; Limited availability of disaggregated data for disabled farmers; Poor knowledge management; Lack of awareness & knowledge on how to consider disabled farmers in capacity building activities	Limited facilities to support capacity building; Shortcake skilled/experience human resources for seed demand forecasting; Limited attention to disabled farmer's needs; Limited information available; Limited availability of disaggregated data for disabled farmers; Lack of well-designed awareness creation tools					

Seed Demand Forecasting System and Processes in Ethiopia

Proceedings of the Validation Workshop

Addis Ababa, May 20th, 2021

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Acronyms

BOA	- Bureau of Agriculture
DSM	- Direct Seed Marketing
EGS	- Early Generation Seed
MOA	- Ministry of Agriculture
Q&A	- Question and Answers

1. Introduction

In FY2021, S34D undertook an assessment of the current system and processes for seed demand forecasting in Ethiopia. After the initial analyses were conducted, S34D conducted a stakeholder validation workshop with informants from federal and regional/local partners. The workshop was held on May 20, 2021, through a combination of semi-virtual and in-person arrangements.

The overarching goals of the workshop was to – validate the approach and findings, find responses to S34D’s clarifying questions, and review S34D’s initial recommendations for the road map on how to improve and strengthen the existing seed demand forecasting system in Ethiopia.

Thus, the specific objectives of the workshop were to:

- develop a shared understanding of the seed demand forecasting process currently in place
- share the findings of the assessment
- validate the findings and fill any gaps,
- co-develop and validate recommendations to strengthen and modernize the process.

2. Participants of the Workshop

S34D invited key stakeholders from across all levels – local to regional and federal. Thus, we had participation at the kebele, woreda, zonal, regional, federal MoA, public, and private seed producers/enterprises, cooperatives/union and agricultural research institutes. In total, 28 participants took part in the workshop organized in three locations: Addis Ababa, Bahir Dar, and Adama with some participants attending outside the three sites virtually. The list of workshop participants is given in **Annex 1**.

3. Approach and Agenda of the Workshop

The workshop started with registration of participants and connecting the participants in the three workshop venues through Microsoft Teams platform. The workshop program is given in **Table 1**.

The workshop presentation slides are shown in **Annex 2**.

Table 1: The program of the workshop

Time	Activities
8:30-9:00am	Registration and connecting groups
9:00-9:30	Introduction, welcoming remarks & appreciation for support and contributions, setting the stage, purpose/expectations, the program
9:30-11:00	Approach of the study and findings- Certified seed- data and process at different levels;
11:00-11:15	Tea/Coffee Break
11:15-12:30	Q&A, Discussion and Validation of findings and recommendations
12:30-1:30pm	Lunch Break
1:30-2:00	Findings- EGS- data and process at different levels
2:30-3:00	Seed distribution, capacity gaps, awareness raising
3:00-3:30	Q&A, Discussion and validation based on validation questions
3:30-3:45	Tea/Coffee Break
3:45-4:50	Q&A, discussion and validation of findings and recommendations
4:50-5:00pm	Closing

4. Discussions

There are three main parts of the discussions – the first is on certified seed demand forecasting processes, second is on the EGS forecasting, and the third component is on the recommendations going forward.

4.1 Certified Seed Demand Forecasting

Intensive discussions were held on the certified seed demand forecasting flow chart and comments for improvements given. **Table 2** summarizes the questions and issues discussed. Prior to the stakeholder workshop, S34D developed an initial schematic that describes the certified seed demand forecasting in the country, but this was reviewed and finalized with stakeholders as depicted in **Figure 1**.

Table 2: Questions and discussions – certified seed demand forecasting process

Questions (Q)	Discussions/results
<p>Q1. What is missing in the flowchart? Is there anything that is erroneous presented?</p>	<ul style="list-style-type: none"> ❖ Certified seed flow chart: participants suggested the following missing items to be included in the certified seed flow chart: <ul style="list-style-type: none"> ○ Delete “Woreda” in “Woreda Multipurpose Cooperative” ○ Connect multi-purpose coops with woreda BOA using black/grey arrow on the flow chart to show that they also submit seed demand to the woreda BOA. ○ Change “Private Seed Enterprise” to “Private Seed Producers or companies”. This is because, the so called “Private Seed Enterprises” are too small in size, some call themselves as seed companies, but the most appropriate naming is “Private Seed Producers”. ○ Connect Direct Seed Marketing (DSM) with public seed enterprise using red-broken arrow on the flow chart. Remember there are agents for public seed enterprises who directly meet with farmers during seed sell. Though not well established, DSM is a new approach for seed distribution using cooperatives, unions and individuals as agents working on commission. ○ Improve regional seed demand arrow (RED LINE) in to broken line but BOLD Line. This endorses the functional relationship established in the presentation, but that the linkage is weak and hence should be broken line. Bold line is to improve visibility. ○ Add Higher Learning Institutions (HLIs) box as they have stake in the variety release and seed distribution. i.e. Connect Regional BOA with HLIs as HLIs also should know the demand for certified seed so that they can plan or provide EGS for its production. ○ Add seed company box and link with Federal MOA and Regional BOA using red line arrow since the seed companies also get to know the demand for certified seed so that they contribute to meeting the demand. Few well established seed companies such as Pioneer have direct link with the federal MOA and regional BOA.
<p>Q2. What gaps do you observe in seed demand data collection process?</p> <p>Q3. What do you observe in seed demand transfer/communication among stakeholders?</p>	<ul style="list-style-type: none"> ❖ Gaps in seed demand data collection and communication process: Participants listed the following limitations during seed demand data collection and communication among stakeholders: <ul style="list-style-type: none"> ○ lacks participatory approach. For example, private seed producers, seed enterprises and cooperatives are not part of the seed demand forecasting done by the bureaus of agriculture and MOA, though they do some estimation of the demand for the seed they produce. ○ less accuracy/reliability of the data ○ high variability in data adjustment approach at different levels

Questions (Q)	Discussions/results																														
	<ul style="list-style-type: none"> ○ limited information on the availability of EGS. EGS is usually scarce and its producers do not share the information of its availability until the demand for certified seed is known. Seed enterprises, which also produce EGS, also need EGS for their own certified seed production. ○ limited communication among stakeholders and often ad hoc ○ limited technical capacity in demand forecasting (know-how) ○ unscientific methodology used at all levels in demand forecasting. There is no means of testing reliability the forecasted demand. There are no statistical procedures for sampling and validating the data. ○ poorly scheduled seed demand data collection, which also lacks uniformity among regions. ○ limited response for forecasted demand by seed suppliers which frustrates farmers for the coming season seed demand registration. This happens because the seed demand data collection is considered by the farmers as if they applied for getting the seed for the next season. But there has not been feedback to the farmers regarding the response (if they get the demanded seed) until the seed distribution time. Lack feedback to the farmers on the status is discouraging them to register their demand in the future. 																														
<p>Q4. How does the seed demand data collection and transfer to the next level scheduled for certified seeds to be sold in the market during mehar season, year 2021?</p>	<ul style="list-style-type: none"> ❖ Timeline for certified seed demand forecasting among regions /zones varies: - Demand assessment carried out annually within the government structure. Various government services at different capacity are engaged with flow data with the schedule shown below. ❖ Participants draw different timelines /periods for seed demand forecasting data collection and submission dates. It was observed that there have been deviations in the schedule at all levels. Participants agree that sometimes the schedule is not according to the regional BoA schedule; there are delays in some cases. The Table below shows the time during which the seed demand for the next year at lower level must pass to the higher level every year. <table border="1" data-bbox="527 1234 1507 1369"> <thead> <tr> <th>Region/zone</th> <th>Kebele level</th> <th>Woreda level</th> <th>Zonal level</th> <th>Regional level</th> <th>Federal level</th> </tr> </thead> <tbody> <tr> <td>Oromia</td> <td>1-Apr</td> <td>15-Apr</td> <td>30-Apr</td> <td>15-May</td> <td>30-May</td> </tr> <tr> <td>Adama /oromia</td> <td>July1-August 20</td> <td>August 21-Sept 1</td> <td>Sept 1- 10</td> <td>Sept11- 15</td> <td></td> </tr> <tr> <td>Amhara</td> <td>May</td> <td>June 1-June 30</td> <td>July 1-30</td> <td>30-Aug</td> <td></td> </tr> <tr> <td>Amhara/Dajen</td> <td>Sept 1-30</td> <td>Oct 15-30</td> <td>Nov 1-30</td> <td>Dec1-Jan 30</td> <td></td> </tr> </tbody> </table> <p>Existing timeline for Certified seed and EGS demand forecasting drawn by participants overlap i.e. the demand for both seed classes are submitted to the higher level during the same period. In fact, clear timeline is set by the regional BoAs for the lower structures to submit the demand for certified seed. Based on the demand for the certified, the regional BoA derives the demand for EGS. Certified seed producers apply for EGS, which forms their demand. The aggregate is the regional demand.</p>	Region/zone	Kebele level	Woreda level	Zonal level	Regional level	Federal level	Oromia	1-Apr	15-Apr	30-Apr	15-May	30-May	Adama /oromia	July1-August 20	August 21-Sept 1	Sept 1- 10	Sept11- 15		Amhara	May	June 1-June 30	July 1-30	30-Aug		Amhara/Dajen	Sept 1-30	Oct 15-30	Nov 1-30	Dec1-Jan 30	
Region/zone	Kebele level	Woreda level	Zonal level	Regional level	Federal level																										
Oromia	1-Apr	15-Apr	30-Apr	15-May	30-May																										
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Amhara	May	June 1-June 30	July 1-30	30-Aug																											
Amhara/Dajen	Sept 1-30	Oct 15-30	Nov 1-30	Dec1-Jan 30																											
<p>Q5. Are there any data elements you think could inform the forecasting processes but is not collected at present? What are those? Why do</p>	<ul style="list-style-type: none"> ❖ Format for certified seed demand forecasting doesn't accommodate all variables: there is no missed data variable in the data elements presented. However, the existing seed demand data collection format does not invite some of the data elements/ variables (no provision for collecting seed quality as the format focuses on quantity) which are important for improving the quality of the seed demand forecasting data. Differences in seed demand of individual 																														

Questions (Q)	Discussions/results
you not collect them now?	household members (women, youth, disabled) is not accommodated since the demand is collected from household head.
Q6. Is it necessary to collect gender and age disaggregated seed demand data? How is women's and youth's preferences addressed?	<ul style="list-style-type: none"> ❖ Gender and age disaggregated seed demand data collection: Participants debated on the importance of gender disaggregated seed demand data collection trend. One of the justifications was that though the preference of both male and women farmers varies, those preferences are not addressed independently. This means that the seed supply chain doesn't consider gender disaggregated approach to address their preference once the demand is submitted. Thus, implication for registering farmers based on sex disaggregation during seed demand forecasting process is not clear. Note that the gender column on the seed demand collection format for female by default represents female headed household but not female farmers. This means, seed demand is collected at household level, not on individual level. ❖ On the other hand, the existing seed demand forecasting data collection format do not invite age disaggregated data. At the end, the participants suggested to address farmers' preference for variety and quantity at household level (family) while collecting data for seed demand forecasting as the family preference varies. The participants didn't see the need for age disaggregated seed demand data collection and, so far, there is no practice to address youth preference in this regard.
Q8. Market preferences – what kind of information do you want to see included in the process that will strengthen the forecasting methodology and accuracy?	<ul style="list-style-type: none"> ❖ Information for market preference: participants suggested information mostly needed for market preference (products demand and for which prices are high) to include demand side (price), productivity (yield per ha) and disease resistance of the given variety. In addition, they suggested the need for variety demonstration plots for seed producers to promote available varieties having high demand rather than just demonstrating only new varieties.
<p>Q9. How does one region know about seed surplus or deficit in another region?</p> <p>Q10. How can this information flow be more transparently?</p> <p>Q11. How can demand / supply of seeds be made more transparent in the market?</p>	<ul style="list-style-type: none"> ❖ Information on seed surplus or deficit among regions and transparency: In order to get information on seed surplus /deficit the Input Directorate of the regional BOA often calls the Input Directorate at the federal MoA through telephone. The MOA acts as a bridge for this information as seed producers inform the MOA the seed available with their enterprises/companies. There is no established seed database to check online. Usually, Regions inform MoA the surplus seed they have at the end of planting season which may not be used in the same season by other regions. There is lack of transparency in informing the surplus seed amount in most cases before the end of the planting season. Public seed enterprises are in a better position in having information of each other on which variety there could be a deficit or surplus. The public seed enterprises produce EGS and certified seed. So, the federal and regional public seed enterprises share their information horizontally (not through the BOA or MOA) and hence they have higher chance of accessing EGS availability than other certified seed producers and meet their demand if they have gaps.
Other issues raised: #1	<ul style="list-style-type: none"> ❖ Certified Seed price setting mechanism: the four public seed enterprises in Ethiopia fix certified seed prices twice annually (for self-pollinated crops and hybrids). Both MoA and EIAR are observer during seed price setting (please add

Questions (Q)	Discussions/results
	<p>EIAR as observer in the observation statement). During the process, all seed enterprises present their seed price based on their cost of production. The average price of all seed enterprises taken as the final seed price for certified seed. Whereas EGS seed price is based on the set certified seed price. As a common practice, the following percentage is added on top of certified seed price for the following seed classes price determination.</p> <ul style="list-style-type: none"> ○ Basic seed price = 10% added on top of certified seed price ○ Pre-basic seed price= 15% added on top of certified seed price ○ Breeder seed price= 20% added on top of certified seed price <p>-There is no participation of private seed producers on the price setting platform at national level as there is serious difference in the cost structure of the private seed producers and public seed enterprises which is created due to difference in land available for seed production. Some public seed enterprise own land and could produce seed cheaper than the private seed producers whereas the centralized seed price setting is based on average costs of the producers. There were attempts to include them in the process but there was no agreement as the private seed producers always want higher price and the public seed enterprises consider affordability by smallholder farmers.</p>
Other issues raised: #2	<ul style="list-style-type: none"> ❖ Seed demand forecasting data adjustment trend: Seed demand forecasting data collection starts at kebele level and submitted to higher levels until it reaches MoA. At all levels, there are some adjustments on the data. ❖ Participants worried about the quality and reliability of data where it will lead to poor seed demand estimation/forecasting at all levels. The concern is based on fear of distorting the demand when the adjustment is made.
Other issues raised: #3	<ul style="list-style-type: none"> ❖ Public seed enterprises lack trust on seed demand forecasting data collected by BoA. Public seed enterprises have a distrust on the reliability of data coming from kebeles to BoA particularly in terms of the demanded variety type and quantity. Thus, they have a trend to assess seed demand by themselves to cross check /triangulate with the demand submitted by BoA. Public seed enterprises have branch offices in different parts of the region they operate in. They collect the data through their branch offices and that data become cumulative seed demand plan for the enterprises.
Other issues raised: #4	<ul style="list-style-type: none"> ❖ Capacity building at grass root level to collect seed demand data should extend to cooperatives as well.

Figure 1: Schematic process – Demand forecasting of certified seeds in Ethiopia

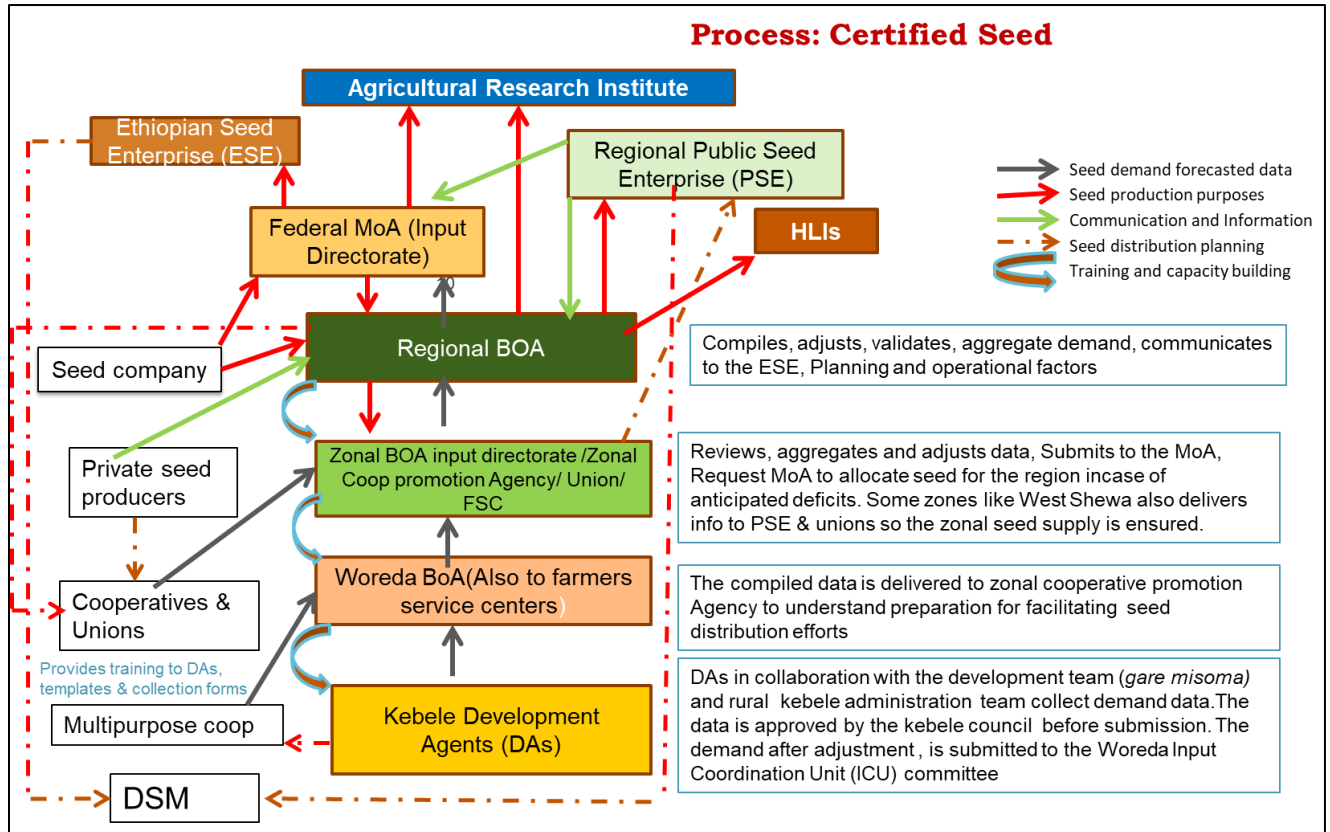
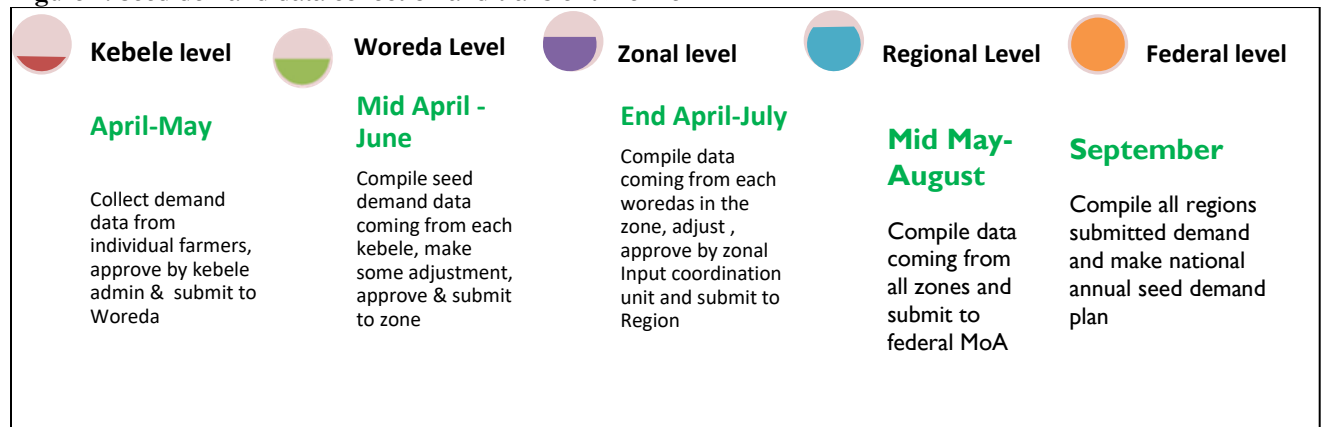


Figure 2 summarizes the activities accomplished at different levels in the seed demand forecasting process and the schedule for accomplishing them. That means, the estimation of seed demand for the following year starts at kebele level in April of the previous year and reaches the federal MOA in September. The demand is then communicated to seed producers in October. The seed producers then review what they are producing during the current season (which is what??) and give feedback to the MOA or BOA after the seed is harvested (which is when??). If there is gap between demand and supply, some seed producers may plan to produce additional seed using irrigation during the off season (which is when?). This indicates that the plan for seed production by the seed producers does not match with the estimated seed demand in terms of the planning horizon since the demand for certified and EGS are estimated at the same time

Figure 2: Seed demand data collection and transfer timeline

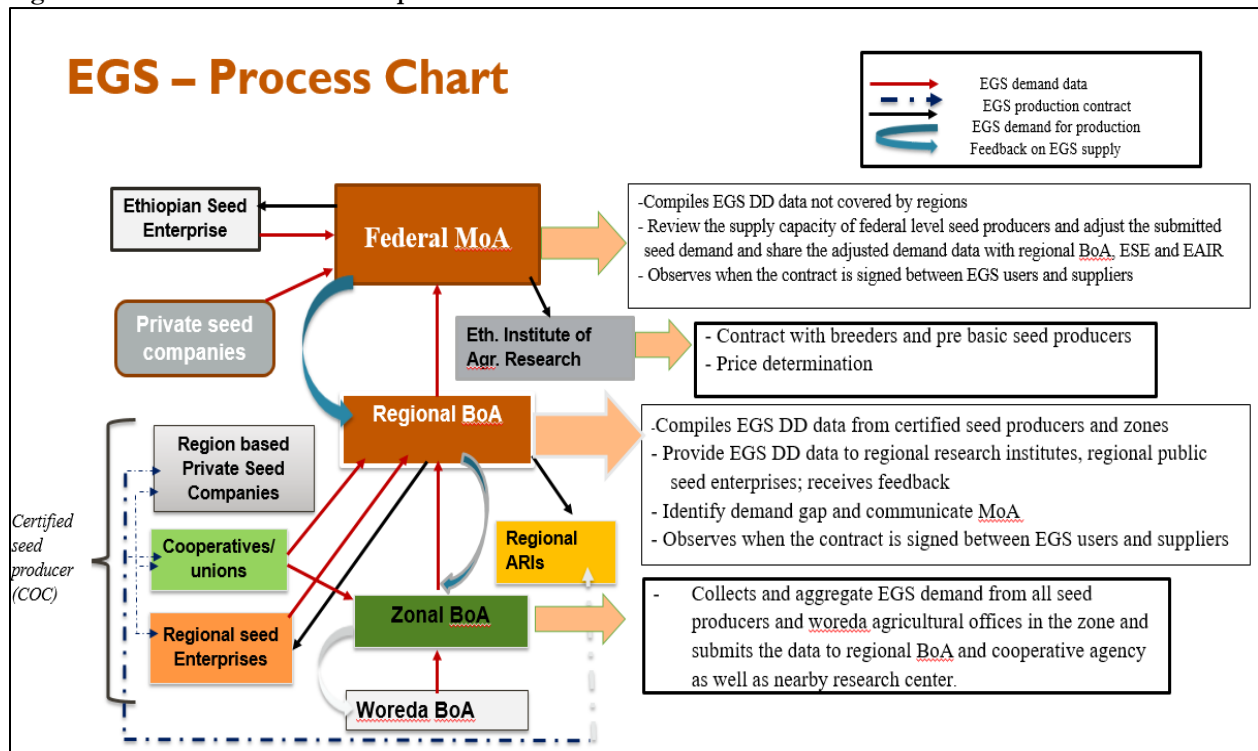


4.2. EGS Demand Forecasting

- EGS flow chart: participants suggest the following items
 - Make feedback arrow on EGS supply visible
 - Draw arrow that link public seed enterprises with EIAR and RARIs since the public seed enterprises get breeder seeds from research institutes to produce basic seeds.
 - There was variation among zones regarding EGS data collection.
 - Arsi zone reported it collects EGS demand from seed producer cooperatives.
 - West Shewa in Oromia and the west Gojjam zone in Amhara stated they do not collect EGS seed data.
 - Participants also stated that cooperatives report their EGS demand to cooperative agencies and woreda agriculture office.
 - However, the existing regulation is that the regional BoA is authorized to collect EGS demand data. Thus, demand forecasting for basic seed is irregular at zonal level.
 - Regions also undermine the importance of EGS demand forecasting by Zones. Then, it was agreed to cancel woreda and Zone from EGS flow chart as most of zones and woredas don't collect EGS seed demand and that the chart should be compatible with the official rule.
 - In general, there is agreement that the EGS forecasting process is not standardized since the role of zonal agriculture office in forecasting the demand for EGS is not uniform within and among the regions. Thus, it was suggested that the flow chart should represent the formal system, which is recognized by the regional bureaus of agriculture.

Following the discussions and comments given by the workshop participants, the EGS demand forecasting process is schematically illustrated in **Figure 3**.

Figure 3: EGS demand estimation process



- Participants confirm that for EGS demand forecasting, the total amount of Certified seed requested by farmers and variety type are the bases. Public seed enterprises meet with seed producers through their respective BoA during EGS demand forecasting and signing seed supply agreement.
- The role of regional BoA in this case is linking EGS producers and the research institutes which provide breeder seeds and act as witness.
- For many reasons, participants suggest the need for finalizing EGS demand forecasting and agreement signing period not later than the end of February each year. This helps EGS suppliers for their planting preparation for what is forecasted.

5. Additional Recommendations from the Stakeholders

- The need to provide training/capacity building for farmers, primary coops, and unions on seed demand forecasting to improve their skill and knowledge in seed demand estimation. Primary cooperatives and unions play dual role in seed system. They play roll in seed distribution since the public extension system distribute seeds and fertilizers through cooperatives and unions. There are some cooperatives and unions specializing in seed production. These cooperatives and unions should have the capacity to assess the demand for the seed they produce. They also estimate the amount of EGS they need.
- Seed demand data collection methodology should be participatory which means it has to be at household level (family based) where the preference of women and youth in terms of varieties and quantities captured. Currently, only the head of the household is involved in estimating the seed demand of the household.
- The need to provide professional advice for farmers to get their accurate market preferences i.e. awareness creation regarding market demand. In addition, there should be professional seed demand assessment method for market information collection including price, type and quantity demanded.
- Seed pricing mechanism should be checked with grain price. The price of seed should be far better than the grain price to give value for seed and protect misuse of seed. If seed price is equal or less than grain price, it will kill the seed business in the future. For example, in this year the grain price of wheat

is 2850 birr/qt and OSE sold wheat seed at 2950 birr/qt which is nearly equal. The other seed enterprises, for example ESE sold the same crop seed at 3390 birr/qt. This was the price all seed enterprises fixed together. However, because of the interference of the regional government, OSE was forced to decrease its seed price from 3390 to 2950 birr/qt.

- ❖ There is a need for specific capacity building for grass root level key stakeholders (farmers, DA and woreda) on:
 - Participatory seed demand forecasting data collection methods,
 - Awareness creation on varietal alternatives,
 - Business planning and record keeping skills for farmers so that the farmers provide reliable data at the kebele level, where the seed demand data collection starts.

6. Recommendations for the Technical Roadmap

The following recommendations were endorsed/suggested by the workshop participants

Sr. No	Recommendations	Specific objectives and activity/Action
1	Establish digital seed demand forecasting system	<ul style="list-style-type: none"> ○ Digitalizing the seed demand data help in improving forecast accuracy and respond to demand changes in real- time. It also empowers demand collectors, forecast confidentiality and to shape the demand according to the market situation. Thus, ○ Move from paper to digital at all levels. Even at higher level, although computers are available, data exchange is mixed: paper based and electronic transfer (not IT based). ○ Build the necessary facilities needed for digitalization ○ Include other leading indicators of demand forecasting in addition to the existing ones (i.e., market data specially price) ○ Collect and share good quality near real-time information on the seed-grain price ratio to increase market transparency
2	Build technical capacity for stakeholders at grassroots levels	<ul style="list-style-type: none"> ○ Train DAs, Coops and other seed producers on participatory seed data collection methods and market information ○ Train farmers on business planning skill to understand the benefits of seed (understanding the benefit in economic terms) ○ Create awareness for farmers on varieties and their alternatives to get accurate demand ○ Create awareness and provide training at all levels in the context of changing seed demand after the seed demand estimation is made.
3	Establish seed demand forecasting system	<p>In most cases seed production doesn't match farmers' demand due to absence of sound seed demand forecasting mechanism.</p> <p>The MoA employs a bottom-up demand-assessment, with input from kebeles, to region about the farmers seed needs. However, the process currently does not consider shifts in demand due to changes in rainfall pattern, farmer preferences, and the overall market. The precise methodology involves a rough estimate of the types and quantities of seed farmers want to purchase the following year in each region. However, shifts in demand due to changes, for example, in rainfall pattern, market situation etc. are not considered.</p>

Sr. No	Recommendations	Specific objectives and activity/Action
		<ul style="list-style-type: none"> ○ Improve the methodology of forecasting to capture shifts in demand Clearly identify and take into account major factors that leads to shift in seed demand ○ Put system of regular and more than onetime demand assessment method by seed suppliers/requesting agencies <p>Work with the government to lead a collaborative process with players across the seed value chain, including research institutes, seed producers, and cooperatives, to forecast demand on the basis of current market conditions.</p>
4	Establish seed database	<ul style="list-style-type: none"> ○ Sustainable seed sector development demands a data revolution to improve the availability, quality, timeliness, and disaggregation of seed data at all times. The effective use of seed data can help to galvanize development efforts, implement successful targeted interventions, track performance, and improve accountability of both seed suppliers and users. The system should also provide visibility to seed companies and stakeholders involved in the seed industry and provide information on the seed market (supply, estimated demand, suppliers, price, place etc.) and dissemination of relevant information to relevant actors. Currently, there is a significant challenge in effectively forecasting and fulfilling farmers' seed demand, both in terms of crop variety and volume. Thus, the establishment of seed database is crucial to ensure an effective communication and decision on seed demand, production, supply, distribution, allocation, leftover, and use. The database could be established within the MOA and managed by the Input Directorate with access to all stakeholders. ○ This is to make data on seed demand and supply publicly available through a national and regional data center(s) or facility. In this way seed producers and seed consumers can more effectively negotiate over the terms of exchange and assume responsibility for production and consumption if information is readily available. But some seed companies are concerned of confidentiality issues if the database is public. ○ Build the necessary technical and facility capacity for seed database installation and management. ○ Encourage centralized database to increase transparency through managing privacy issues of seed suppliers and avoiding intervention in the seed distribution system ○ Explore global experience to build seed suppliers confidence on establishing central database.
5	Strengthen documentation system	<ul style="list-style-type: none"> ○ Move data from experts' hand to institutionalized data library at respective institutions. Most of the seed data are not available incase an expert leaves the organization. ○ Install digital library with seed data archives at all administrative levels ○ Improve data storage system, quality, and facility.

Sr. No	Recommendations	Specific objectives and activity/Action
6	Put in place standard for data need and data collection method	<ul style="list-style-type: none"> ○ Train key stakeholders and practitioners on data collection process ○ Include other stakeholder such as Central Statistics Agency of Ethiopia for technical capacity building
7	Improve inclusiveness of seed producers during seed price setting	<ul style="list-style-type: none"> ○ Private companies have played a very limited or no role in the seed price setting process. This is due to a structure in which public seed enterprises in consultation with MoA agree on uniform prices with no or limited role of private sector players. ○ Directly or indirectly, all seed producers, with the exception of international seed companies, are compelled to sell their seed at prices that do not account for varying quality levels (brand) and of productivity of the variety and production cost differences. ○ Moreover, seed producers vary in their location and hence have varying production and distribution cost structures (such as transport, processing and storage costs). A price setting process that does not enable for flexibility based on real-time demand affects not only the volume of the seed produced but also private seed producers' engagement in the seed business. ○ Include private sector entities in the forum for national seed price setting. ○ Investigate and manage conflict of interest of private seed producers with public seed enterprises.

Annex 11.1. Stakeholder Participation in the Validation Workshop

26 people from public and private seed enterprises, Bureau of Agriculture, EIAR, ATA, zonal agriculture offices and cooperative unions participated in the validation workshop. Three of the participants represented the Federal level, 9 the Amhara regional level and 14 the Oromia regional level.

S. No	Name of Participant	Region/ Level	Organization	Telephone	Email
1					
2					
3					
4				Dr. Karta Kalsa (EIAR)	
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Annex 11.2: Power Point Presented at the Workshop



FEED THE FUTURE GLOBAL SUPPORTING SEED SYSTEMS FOR DEVELOPMENT – S34D

May 2021

Seed Demand Forecasting in Ethiopia: Assessment and Recommendations for a Technical Road Map

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HEDBEZ



Purpose of the Workshop

- **The purpose of the workshop is to develop a shared understanding of the seed demand forecasting process currently in place**
 - We share the findings of the assessment made
 - You validate the findings and fill any missing gaps
- **From that understanding develop a set of recommendations to improve and strengthen the process**
 - We provide some recommendations from our perspectives
 - You validate the recommendations and add any other recommendations you think will be useful to improve or strengthen the seed demand forecasting process

Introduction

- **Workshop is organized in semi-virtual platform in 3 locations**
 - CRS Office in Addis Ababa – for stakeholders in AA including Oromia regional
 - Adama town- for stakeholders in Oromia (outside AA)
 - Bahir Data – for stakeholders in Amhara region
- **Participants are invited from all levels:**
 - Kebele, woreda, zone, region and federal MoA
 - Public and private seed producers
 - Cooperatives
 - Research

Agenda

Time	Activities
8:30-9:00am	Registration and connecting groups
9:00-9:30	Introduction, welcoming remarks & appreciation for support and contributions, setting the stage, purpose/expectations, the program
9:30-11:00	Approach of the study and findings- Certified seed- data and process at different levels;
11:00-11:15	Tea/Coffee Break
11:15-12:30	Q&A, Discussion and Validation of findings and recommendations
12:30-1:30pm	Lunch Break
1:30-2:00	Findings- EGS- data and process at different levels
2:30-3:00	Seed distribution, capacity gaps, awareness raising
3:00-3:30	Q&A, Discussion and validation based on validation questions
3:30-3:45	Tea/Coffee Break
3:45-4:50	Q&A, discussion and validation of findings and recommendations
4:50-5:00pm	Closing

6

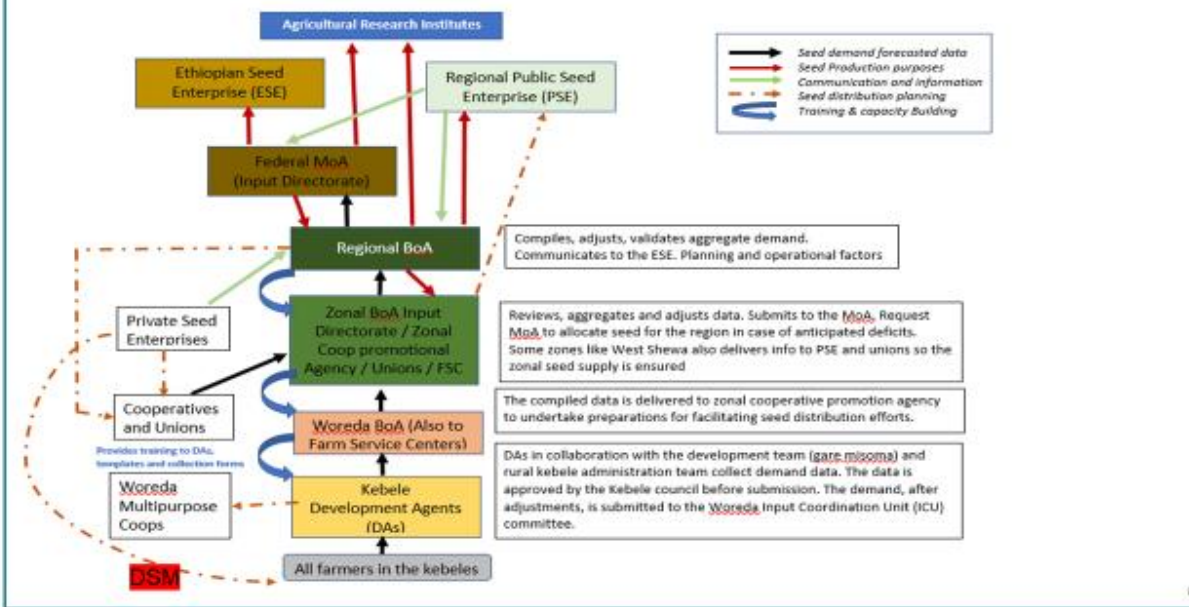
Objective of the study

- Assess the existing seed demand forecasting process to identify areas that could be strengthened
- Take inventory of current data sources, and gaps that will need to be fulfilled
- Develop a technical road map to enhance and refine the current state

Study Design & Approach

- Selected key cereal crops (Food security, development priority)
- Focus on the formal seed sector (certified, EGS)
- Selection of geographies based on potential demand for seed
- Selecting key stakeholders for interviews – bottom-up approach
- Design tailored survey instruments for each group of the stakeholders based on the roles they play in the process and the data value chain
- Conduct interviews and information collection

Process: Certified Seeds



What is missing in the flowchart? Is there anything that is erroneous presented?

- **Missing items?**

- **Items to be corrected?**

Data used for forecasting: Certified Seeds

Variables used for forecasting	Kebele	Woreda	Zone	RBoA	MoA	Public Seed Enterprise	Private Seed Comp	Coop
Area under cultivation	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected
Seeding rate	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected
Variety needed	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected
Number of households growing the crop	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected
Quantity of seed needed	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected
Seed replacement trend	Commonly / always collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected
Opportunity for varietal change	Commonly / always collected	Partially / sometimes collected	Commonly / always collected	Partially / sometimes collected	Partially / sometimes collected	Commonly / always collected	Commonly / always collected	Commonly / always collected
Volume of seed supply, trend	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected
Volume of seed use trend	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected
Use of farm saved seeds	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected
Informal exchange of seeds and planting materials	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected
Number of men growing the crop	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected
Number of women growing the crop	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected
Number of male youth growing the crop	Commonly / always collected	Partially / sometimes collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected	Commonly / always collected
Number of female youth growing the crop	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected
Market opportunity for seed	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected
Market opportunity for seed grain	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected
Others (type of soil & ecology in one kebele in Amhara)	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected	Partially / sometimes collected

Null or N/A
 Partially / sometimes collected
 Commonly / always collected

10

Are we missing any data?

1. Is our understanding correct? If not what is missing?
2. Are there any data elements you think could inform the forecasting processes but is not collected at present? What are those? Why do you not collect them now?
3. How do you choose the farmers from whom you collect data at each kebele level?

We need to know more:

1. Is it necessary to collect gender disaggregated seed demand data? How is women's preference addressed?
2. Is this not necessary collect age disaggregated certified seed data? How do you assess preferences of the youth?
3. Market preferences – what kind of information do you want to see included in the process that will strengthen the forecasting methodology and accuracy?

What are the gaps in the methodology?

- What gaps do you observe in seed demand data collection process?
- What do you observe in seed demand transfer/communication among stakeholders?

Clarification of timeline (certified seeds + EGS)

Group work

- *Say for example: how does the seed demand data collection and transfer to the next level scheduled for certified seeds to be sold in the market during Mehr season, year 2021*
- *Participatory workout along the following path:*



More Clarification Needed

- **How does one region know about seed surplus or deficit in another region?**
- **How can this information flow be more transparently?**
- **How can demand / supply of seeds be made more transparent in the market?**

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Recommendations for the technical road-map (participants provide clear examples of what exactly they would want)

- Move from paper to digital (Yay)?- facilities for digitalization needed
- Build technical capacity at grassroots levels (Yay?)
 - Please list the kinds of capacities needed- on participatory data collection for DAs, coops and other seed producers; Market information; awareness creation on varieties and alternatives; business planning skill for farmers to understand the benefits of seed;
 - Not only at grassroots level- awareness creation and training in the context of dynamics of seed
- Collecting and sharing good quality near real-time information on the seed-grain price ratio to increase market transparency (yay?)- part of #1; database establishment and building the capacity for that
- Improving the methodology of forecasting to capture shifts in demand (yay).
Any suggestions or recommendations? Establish demand forecasting system and which takes into account factors that leads to shift in demand; put system of regular and more than onetime demand assessment method by suppliers/requesting agencies
- Centralized database to increase transparency; (Nay)- controversy exists on the need due to privacy; intervention in the distribution system also makes suppliers a bit reluctant. Global experience should be explored
 - At what level (Regional/Federal/Zonal)
- Strengthen documentation system (yay/nay?)- move data from experts hand to institutionalized data library at respective institutions; data storage system and facility
- Please explain

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Recommendations (Continued)

- Digital library with data archives (yay?)
 - At every administrative level? at all levels
- Put in place standard for data need and data collection method- including sampling process (yay)
 - Please give examples
- Role of private sector entities in setting prices? There is conflict of interest with public enterprises! explain
- Role of central statistical agency (CSA) in improving methodology?

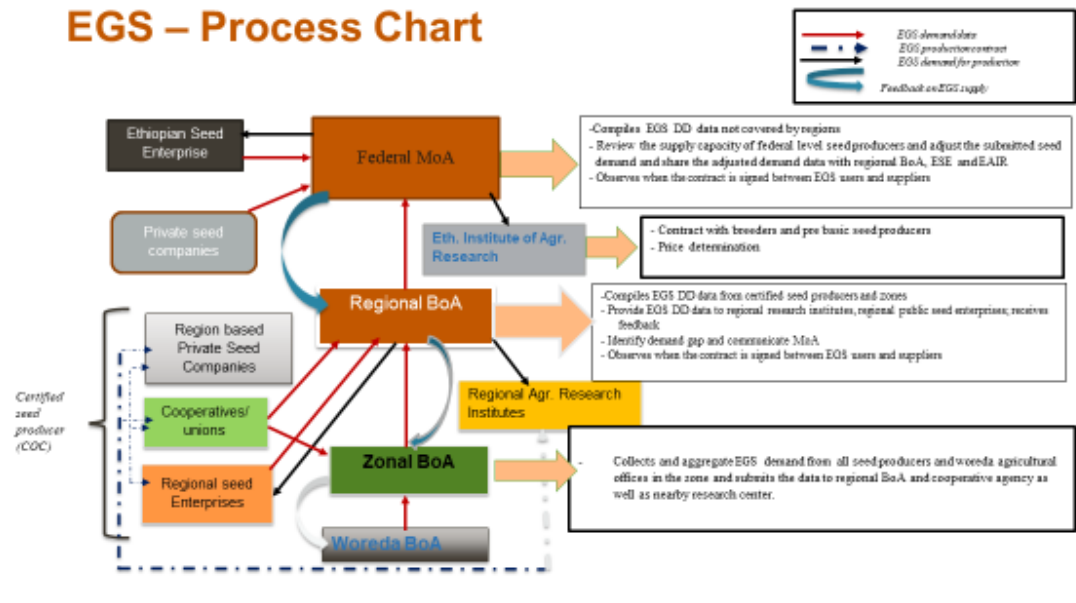
Any other recommendations?

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Session on EGS

- Focuses on EGS demand forecasting process
- Similar approach of data collection and instruments used as with cert
- Stakeholders involved in EGS demand forecasting were interviewed
- It is expected that the participants reach common understanding of the key findings, fill gaps and enrich recommendations

EGS – Process Chart



What is missing in the flowchart? Is there anything that is erroneous presented?

- **Missing items?**

- **Items to be corrected?**

Data used for forecasting: Early Generation Seeds (EGS)

Variable	Woreda	Zone	RBoA	MoA	Public Seed Enterprise	Private Seed Co's
Area under cultivation	Commonly collected	Commonly collected	Commonly collected	Commonly collected	Commonly collected	Commonly collected
Seeding rate	Partially collected	Commonly collected	Commonly collected	Commonly collected	Commonly collected	Commonly collected
Variety needed	Commonly collected	Commonly collected	Commonly collected	Commonly collected	Commonly collected	Commonly collected
Number of households growing the crop	Partially collected	Commonly collected	Commonly collected	Commonly collected	Partially collected	Commonly collected
Quantity of seed needed	Commonly collected	Commonly collected	Partially collected	Commonly collected	Partially collected	Commonly collected
Seed replacement trend	Partially collected	Partially collected	Partially collected	Partially collected	Partially collected	Partially collected
Opportunity for varietal change	Partially collected	Commonly collected	Partially collected	Partially collected	Partially collected	Partially collected
Volume of seed supply, trend	Partially collected	Partially collected	Commonly collected	Commonly collected	Commonly collected	Commonly collected
Volume of seed use trend	Partially collected	Commonly collected	Commonly collected	Partially collected	Commonly collected	Commonly collected
Use of farm saved seeds	Partially collected	Commonly collected	Commonly collected	Commonly collected	Commonly collected	Commonly collected
Informal exchange of seeds and planting materials	Partially collected	Commonly collected	Commonly collected	Commonly collected	Partially collected	Partially collected
Number of men growing the crop	Commonly collected	Commonly collected	Partially collected	Commonly collected	Commonly collected	Commonly collected
Number of women growing the crop	Commonly collected	Commonly collected	Partially collected	Commonly collected	Commonly collected	Commonly collected
Number of male youth growing the crop	Commonly collected	Commonly collected	Partially collected	Commonly collected	Commonly collected	Commonly collected
Number of female youth growing the crop	Commonly collected	Commonly collected	Partially collected	Commonly collected	Commonly collected	Commonly collected
Market opportunity for seed	Partially collected	Partially collected	Commonly collected	Commonly collected	Commonly collected	Commonly collected
Market opportunity for seed grain	Partially collected	Partially collected	Commonly collected	Commonly collected	Partially collected	Partially collected

Nil
 Partially collected
 Commonly collected

Are we missing any data?

1. Is our understanding correct? If not what is missing?
2. Are there any data elements you think could inform the forecasting processes but is not collected at present? What are those? Why do you not collect them now?

Recommendations for the technical road-map

- Recommendations for digitalized data collection, storage and data transfer applies for EGS, too. (Yay/Nay)?
 - Please explain what capacity building is needed specifically for EGS.
- Improving the methodology of forecasting to capture shifts in demand (yay/nay?).
 - Any suggestions or recommendations?
- What other technical capacity building is necessary to improve EGS forecasting process?
- What should be done to improve the EGS pricing mechanism so that the producers are motivated?