



FEED THE FUTURE

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



Seed Policy Provisions and Operational Challenges in Ethiopia



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Activity Title: Feed the Future Global Supporting Seed Systems for Development activity

Activity start date and end date: Aug 24, 2018 – Dec 22, 2023

Cooperative agreement number: 7200AA18LE00004

Document title: Seed policy provisions and operational challenges in Ethiopia

Publication date: May 2023

Citation: Hassena, M., Alemu, D., and Dey, B. 2023. Seed policy provisions and operational challenges in Ethiopia. A Feed the Future Global Supporting Seed Systems for Development activity (S34D) report.

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Activity Goal: Improved functioning of the high-impact integrated seed systems

Language of document: English

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Cover page photo credit: CRS

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This report was made possible by the generous support from the American people through the U.S. Government's Feed the Future Initiative and the United States Agency for International Development through Cooperative Agreement 7200AA18LE00004. The contents are the responsibility of Catholic Relief Services and do not necessarily reflect the views of USAID or the United States Government.

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



Acronyms and Abbreviations

ATA	Agricultural Transformation Agency
BoA	Bureau of Agriculture
CoC	Certificate of Competence
DSM	Direct Seed Marketing
EGS	Early Generation Seed
FGD	Focus Group Discussion
KII	Key Informant Interview
LSB	Local Seed Business
MoA	Ministry of Agriculture
PVP	Plant Variety Protection
QDS	Quality Declared Seed
SNNPR	Southern Nations, Nationalities, and Peoples' Region

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1 Introduction

The creation of Ethiopia's formal seed system can be traced to two key events; the founding of the formal agricultural research system in the late 1950s and the start of large-scale seed production following the establishment of the Ethiopian Seed Corporation in 1979 (Alemu, 2011). While these events were both supported by the public sector, seed-specific policy and regulation to guide formal seed sector development only more recently emerged when Ethiopia's draft Seed Policy was initially drafted in 1992. The Ethiopian Seed Agency was then created in 1994 through World Bank support, which spurred the development of Ethiopia's first seed regulation in 1997. Although some private seed companies began production prior to this period, the regulation was designed to control seed production and marketing processes, and was converted to Ethiopia's first seed law in 2000. With the exception of Plant Breeders' Protection Law in 2006, which has not been implemented to present, Ethiopia's seed sector underwent a period of legal and regulatory stagnation until its first seed law was revised in 2013.

Although different regulations and directives have subsequently been developed to facilitate the implementation of the 2013 Seed Proclamation, existing evidence indicates that enacting regulation does not necessarily mean that the frameworks are implemented (MoA/ATA 2017; MoA 2019). A good example is the Plant Breeders' Right law of Ethiopia, which was developed in 2006 and revised after 10 years; despite solid legal underpinnings, Ethiopia has not yet implemented plant variety protection (PVP). On the other hand, many other regulations have been implemented at varying scales and intensities within different regions, and with variable adherence to the regulation en masse. Such implementation inconsistencies occur for assorted reasons, such as disparate levels of knowledge and awareness of specific regulatory provisions and, critically, gaps in the technical and physical capacities needed for efficient implementation.

The current study aims to understand why regulatory provisions are not operationalized at scale by: (1) assessing the levels of operationalization of seed-related regulatory provisions and then (2) identifying reasons behind low levels of implementation. To contain the scope of the present assessment, the study focuses on three key regulatory arenas that would push the frontier for seed markets and formalize the informal seed systems in Ethiopia. The approach used in this assessment is discussed in **Section 2**. Results of the analysis are presented in **Section 3**. Concluding remarks and practical recommendations on how to reduce implementation barriers are provided in **Section 4**.

2 Study Approach

A three-step approach was taken in line with the aims of this study. First, an inventory was created with all relevant seed policies, laws, regulations, and directives to prioritize regulatory arenas and understand the status of the operationalization of seed policy provisions as well as key challenges. Regulatory domains were then prioritized using key informant interviews. In the final step, a deep-dive was conducted using a structured survey instrument in order to analyze operational efficiency, challenges, and divergences in the understanding of regulatory provisions across regions within Ethiopia, and to generate evidence of implementation practices. **Figure 1** schematically summarizes the study approach.

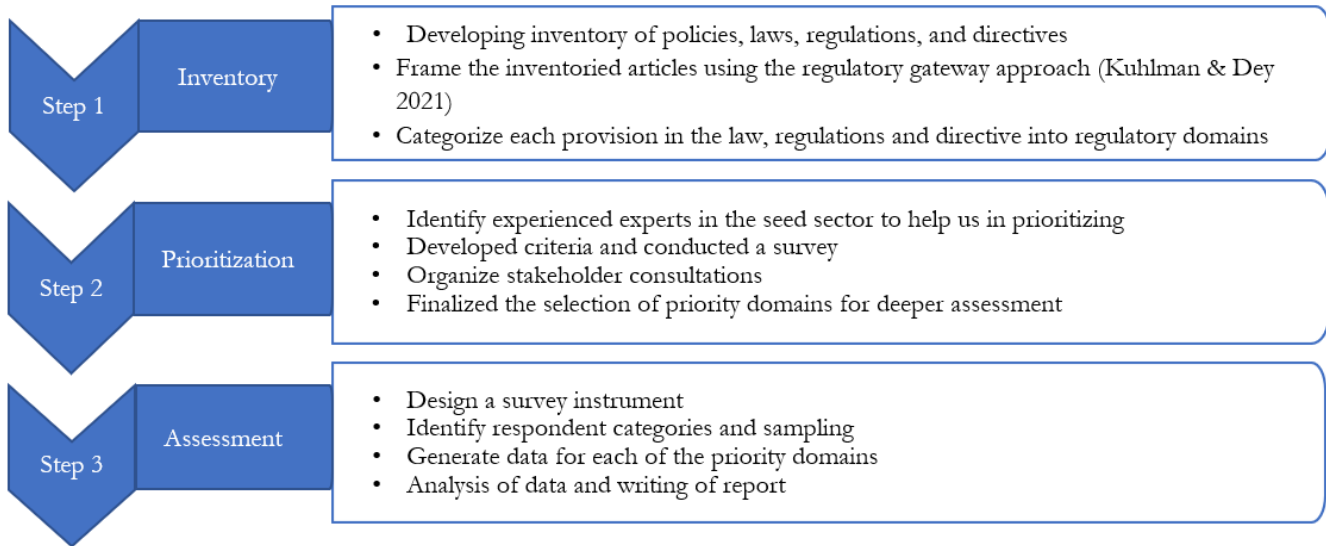


Figure 1. Approaches and steps for assessment

2.1 Inventory of policies and regulatory frameworks

The current study compiled relevant Ethiopian seed policies, laws, regulations, and directives, utilizing the framework of regulatory gateways along the seed system value chain as was used by Kuhlmann and Dey (2021). **Table 1** presents a summary of Ethiopia’s legal and regulatory environment for seed.

Ethiopia’s first seed law was first enacted in 2000 and revised in 2013. The Plant Breeders’ Right proclamation was subsequently passed in 2006 and revised in 2017, though left unimplemented from its initial ratification. Despite its lack of official approval, the 1992 draft seed policy was used as a guiding document until the national seed policy was drafted and enacted by the Ethiopian Ministry of Agriculture (MoA) in 2020. This was preceded by a seed system development strategy in 2017 that indicated, among other, key priority areas of intervention in the areas of regulation, investment and governance (MoA, 2017). Similarly, a document entitled “Transforming the Ethiopian Seed Sector” was approved in 2019, which further elaborated what was needed to transform the sector for six pillars, namely production systems, marketing development, service provision, regulation and management, seed sector revenue generation and re-investment, and seed sector coordination (MoA 2019).

Table 1. Inventory of seed related policies, laws, regulations, and directives in Ethiopia

Type	Year Proposed/ Enacted	Title	Identification
Policy	1992	Draft Seed Policy	MoA
	2000	National Variety Release Policy and Mechanism	MoA
	2020	National Seed Policy (in Amharic)	MoA
Strategy	2017	Seed System Development Strategy: Vision, Systemic Challenges, and Priority Interventions	MoA/ATA
	2019	Transforming the Ethiopian Seed Sector: Issues and Strategies	MoA
Law	2000	Seed Proclamation	206/2000 -Repealed by 782/2013
	2006	Plant Breeders' Right Proclamation	481/2006 -Repealed by 1068/2017
	2013	Seed Proclamation	782/2013
	2017	Plant Breeders' Right Proclamation	1068/2017
Regulations	1992	Plant Quarantine Regulation	4/1992
	1997	Ethiopian Seed Regulation	16/1997 -Repealed by 206/2000
	2015	Rate of Fees for Seed Competency and Related Services	361/2015
	2016	Seed Regulation	375/2016
Directives	2015	DQS Directive (in Amharic)	001/2007
	2017	Provision and Management of Competence Certificate for Seed Business (in Amharic)	2/2010
	2018	Management of Rejected Seed (in Amharic)	3/2010
	2018	Seed Marketing Directive	001/782/2011
	2019	Provision and Management of Competence Certificate for Agricultural Input Marketing Centers (in Amharic)	002/782/2011
	2019	EGS Administration for Public Varieties (in Amharic)	005/782/2012
	2021	Directive for Import and Multiplication of Unregistered Varieties Exclusively for Re-export	456/2021
	2021	Plant Breeder's Right Directive	769/2021

Source: Authors' compilation

2.2 Prioritization and selection of regulatory domains

From the different frameworks listed above, regulatory provisions were listed and grouped to form a regulatory domain along seed value chains. Regulatory frameworks that were not implemented at all, such as plant breeders' rights, were excluded while forming regulatory domains. Accordingly, nine regulatory domains were identified: variety release and registration; unregistered varieties; early generation seed (EGS) production and management; seed quality assurance processes, certification and labeling; follow-up procedures for rejected seed; post-certification controls; seed marketing; and the quality declared seed (QDS) system. Given the [financial and temporal] resource limitations, it was important to contain the scope of the study and thus focus on certain regulatory domains.

An adapted framework from Morestin (2012) was used to identify criteria for selecting regulatory domains for detailed analysis. The framework considers six dimensions of policy analysis categorized in two interrelated issues: (i) the effects of the policy, evaluated by its effectiveness, unintended impacts, and equity issues, and (ii) implementation of the policy, evaluated using cost, feasibility, and overall policy acceptability criteria (Figure 2).

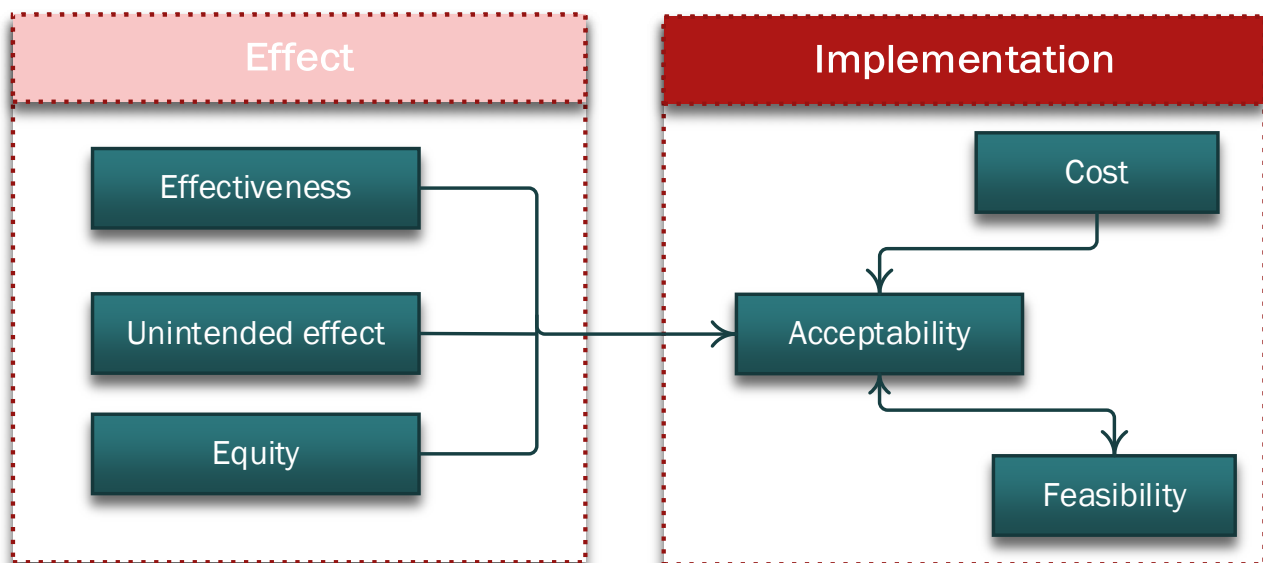


Figure 2. Seed policy implementation analytical dimensions and their relationship (adapted from Morestin, 2012)

Seven criteria related to the framework were identified to facilitate the selection as described below.

1. **Level of implementation gap:** to assess the extent to which the regulation has not been implemented. The wider the gap, the greater the consideration for the next level of analysis.
2. **Potential impact if changed:** to capture the likely effect on the seed sector if implemented as stipulated in the policy/regulatory framework. Those issues with a greater positive effect on the seed sector will be considered for further analysis.
3. **Existence of implementation structures:** to determine whether there are already structures in place to implement the regulation or if there is a need to establish new regulation. Those that do not have structures will be considered for further analysis. This is primarily because there may be additional

topics to be explored, as relevant regulations might have not implemented for a variety of reasons (e.g., capacity problems).

4. **Investments needed:** to understand the investments needed to implement the issue at hand. If the policy has not been implemented despite low budgetary requirements, then the reasons for inaction are explored in detail.
5. **Complexity of the issue:** to analyze how complex issues are. The more complex the problem, the more likely it is taken for further analysis.
6. **Political will to implement:** to determine the extent to which the authorities are willing to take up implementation suggestions. It is important to note that political will here does not include budget constraints, which is already considered under 4 above. The more sensitive the issue sensitive, the less likely it will be taken to the next step of analysis.
7. **Existence of supporting project:** to consider whether existing, supportive project(s) exist. The more there are project planning to support to overcome the problem, the more likely the issue will be taken for further analysis.

Table 2 below summarizes how each of the policy dimensions from the adapted theoretical framework is mapped with selection criteria and key statements.

Table 2. Criteria for evaluation and key question for each of the criteria

Policy implementation analysis dimensions	Criteria	Key statement
Effectiveness	Level of implementation gap	The directive has not been fully implemented and there is wide implementation gap
Equity	Potential impact if changed	If the remaining gaps are implemented, there will be huge change on the availability of seed
Feasibility	Existence of implementation structures	There are no any responsible implementation structures for the directive
	Existence of supporting project	There are a number of initiatives that can collaborate in addressing the gap
Cost	Investment requirement	The directive demands very high investment
Acceptability	Complexity of the issue	The directive is complex
	Potential to have political will to implement	The directive has high potential for political will to be implemented

Six experts with extensive experience in the Ethiopian seed sector were identified to evaluate the regulatory domains against the robust set of criteria above using a Likert scale¹. **Table 3** below provides a summary of the outcome of the evaluation, from which three seed regulatory domains were identified for further analysis: i) the QDS system, (ii) seed packaging and labeling, and (iii) seed marketing.

¹ 1-strongly disagree; 2-disagree; 3-neither agree nor disagree; 4-agree; and 5-strongly agree

Table 3. Selected regulatory domains for further analysis

Regulatory domains	1	2	3	4	5	6	7	Average
Variety release and registration	4.0	3.2	2.3	1.8	1.5	2.3	3.8	2.71
Unregistered varieties	4.0	2.4	2.0	2.0	2.0	3.8	3.0	2.74
EGS production & management	4.0	4.33	2.3	2.7	1.7	3.3	3.8	3.17
Seed quality assurance processes	3.5	4.2	2.5	3.5	2.0	3.2	3.5	3.19
Certification and labeling	3.3	3.8	3.0	3.5	2.2	3.5	3.7	3.29
Follow-up procedures for rejected seed	4.0	3.8	2.3	3.2	2.2	3.3	3.5	3.19
Post-certification controls	3.8	4.0	2.0	3.2	2.2	3.3	3.3	3.12
Seed marketing	4.2	4.5	2.5	3.5	2.3	4.0	3.7	3.52
Quality Declared Seed	4.2	4.0	2.3	2.7	2.8	3.3	3.3	3.24

1 = Level of implementation gap; 2 = Potential impact if changed; 3 = Existence of implementation structures;
 4 = Investment requirement; 5 = Complexity of the issue; 6 = Potential to have political will to implement;
 7 = Existence of supporting project

Seed marketing is a broad concept that requires a more discriminate definition to address specific regulatory provisions. Dispute settlement among seed marketing actors (farmers, agents, and seed producers) is a critical issue in seed marketing, encompassing such topics as farmers' complaint management and issues related to fake seed. Seed certification is another a wide-ranging subject, and thus its analysis was narrowed to packaging and labeling, which are primarily associated with the final stages of certification.

2.3 Analysis of operationalization of selected regulatory domains

Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) were utilized to (i) assess the extent to which the identified seed regulatory domains were operationalized and (ii) identify the challenges associated with operationalization. In order to identify key national informants, six categories were created covering all actors along the seed value chain. Respondents were then identified from each of the categories. **Table 4** provides a summary of the KIIs undertaken. Questionnaires were developed for each of the regulatory domains to inform the qualitative data collection process. Voice recording tools were used to capture data during face-to-face and telephonic interviews. A thematic analysis of interview notes identified key themes around respondents' viewpoints.

Table 4. Number of respondents by category for different sets of questionnaires

Respondent category	QDS production		Packaging & labeling	Complaints & resolution	Fake seed	Total
	Importance	Certification				
Agents			10	10	10	10
MoA/BoA	11			11	11	11
Farmers			15	15		15
QDS producer		9	9			9
Formal seed producers			12	12		12
Regulatory	9	9	9	9	9	9
Total	20	18	55	57	30	66

3 Operationalization of Regulatory Provisions and Improvement Options

The following sub-sections (i) review relevant regulatory provisions, (ii) describe current levels of implementation and associated challenges, and (iii) identify options for improvement for each of the selected domains.

3.1 Quality Declared Seed (QDS)

The concept of QDS was formally introduced in 2013 with enactment of seed law 782/2013, which defines QDS as “seed produced by organized and registered smallholder farmers, in conformity with the required quality standards”. Following this definition, a directive was developed in 2015 as to how to implement a QDS production system in Ethiopia. In a similar vein, seed certification standards were developed for 33 different crops. However, the content of the QDS Directive, along with associated implementation practices, indicate that there is a divergence from the QDS principles set globally. Global QDS principles indicate that QDS is a system to serve as an alternative option for seed quality assurance given the challenges of the formal quality assurance in terms of reach, cost, and overall management (FAO, 2006). On the other hand, the Directive, in addition to quality assurance, addresses issues related to other aspects of the intermediary seed system. This study, however, focuses on seed quality assurance through the QDS system.

Regardless of the recognition and development of a regulatory framework, there has been no government intervention to promote QDS. QDS is mainly promoted through projects supported by development partners. As a result, government officials’ knowledge of QDS broadly depends on their exposure to projects that support QDS. It is not uncommon to hear from senior regional officials that they are unaware of what QDS is nor how to implement it, while others are of the opinion that QDS is something that should not be promoted, as it will affect the growth of the formal seed system. Thus, support to the QDS system greatly varies across regions. In Oromia, there is relatively less support for the QDS system, except in providing production licenses. In Amhara and SNNPR, there is some level of QDS recognition, as *woredas*’ offices of agriculture assign experts that technically support QDS producers so long as they do not have a professional license, as per the requirement of the Directive.

3.1.1 Regulatory provisions

The 2015 QDS Directive was released recognizing the important roles that QDS will play in terms of supplying quality seed to farmers in addition to the regulation that required more time of the regulators. Moreover, it also emphasized the role of QDS in covering those agro-ecology and crop types for which the formal seed system does not cover. The key provisions in the QDS Directive are related to (i) crop variety coverage, (ii) actors allowed to engage in QDS production, (iii) QDS quality assurance, (iv) procedures and requirements for variety registration, obtaining a certificate of competence (CoC), packaging, labeling, and distribution, and (v) roles and responsibilities of relevant stakeholders in local variety registration, QDS production, and marketing. In this analysis, the basic provisions (e.g., procedures and requirements to obtain a CoC, quality assurance, and marketing) were considered.

In terms of CoC, the Directive indicates that eligible producers of QDS are farmers’ groups or farmers’ cooperatives who (i) have access to land sufficient for the production of specific crops, farm equipment, storage, (ii) are hired professionals or assigned by its *woreda*’s Office of Agriculture, and (iii) have (their own) access to an internal seed quality control system. The Directive also indicates a quality assurance system for QDS whereby regulators only inspect 10% of the field and take samples and test from only 10% of the produced seed. After the seed is certified, it must be packaged and fixed with a label that contains 14 parameters ranging from the

producer's name to information regarding health hazards, if any exist. Article 4.1 of the Directive contains a pre-requisite that the variety to be used should be one that's registered through QDS system. This is again supported by Article 5.2, which states that an objective of QDS is to make use of local varieties, and by Article 9.1, which further describes the process of registering local varieties. The Directive does not apply to hybrid crop varieties, forest seed, and for public and private seed companies operating in the formal seed sector. Similarly, the marketing of QDS is limited to areas designated by Bureau of Agriculture.

3.1.2 Current level of implementation and challenges

A) QDS production license

The Directive indicates that QDS is only produced by organized and registered farmers' groups or cooperatives though, in reality, 6 of the 9 QDS producers are private. In fact, if a producer has a CoC to produce certified seed, they can produce seed under QDS certification. For instance, Oromia Seed Enterprise, the biggest seed producer in Ethiopia, has recently produced potato seed tuber through QDS certification. In Oromia, the initial CoC of current QDS producers is for certified seed. But since they are currently producing 5th – 8th generations of potato seed, their license was changed to QDS. In addition, none of the varieties used by producers are released through the QDS system. Respondents perceived that the CoC requirements for QDS production are similar to that of certified seed production. Although the criteria are nearly similar to that of certified seed producers, a CoC is given based on only what is required to produce the crop that the producer intends to produce. For potato producers, diffused light storage is considered as a must while, for fruit seedling producers, having access to water and some sort of shade are CoC pre-requisites. In the case of ginger, only land is required as the rhizobium is sold directly from the field. None of these producers have internal quality control facilities or have access to one as stipulated in the Directive.

One of the requirements for a QDS production license is having a seed expert, which has been a challenge for small producers and most of the cooperatives that are willing to engage in seed production. Following the promotion of the Local Seed Business (LSB) model and subsequent formalization of LSBs, which are often considered QDS producers, the issue of seed experts has been a previous discussion point in all regions. While the QDS Directive of 2015 indicates that *woreda* Offices of Agriculture are to assign an expert to support the LSBs, the implementation of assigning such experts has been varied. In Oromia, this measure was only taken as a formality where the *woreda* Offices of Agriculture write a letter indicating that *woreda* expert will support the QDS producer; however, no experts are providing actual producer support within the region. In Amhara, the assigned expert was mandated to support the QDS producer, and a photo of the expert is attached to the producer's license. Some QDS producers from Amhara indicated the support that they get from the expert. In SNNPR too, the assigned experts support the QDS producers.

None of the regulatory authorities in the regions have followed the Directive in providing CoC to QDS producers precisely as intended, as they focused on crop requirements rather than what is written in the Directive. In reality, the Directive is non-implementable as it is only applicable to local varieties registered through QDS system. The practical flexibilities currently undertaken lend themselves as examples for the necessary future amendment of the Directive.

B) QDS Certification

Once the producer has the license and decides to produce the seed under QDS, s/he has to apply for certification, which is often the same with certified seed production. A field visit is also required, for which the producers must pay. While the Directive indicates that only 10% of the producer's field must be visited, in practice, inspectors have been inspecting the whole field. All the interviewees indicated that the whole field or

shed is inspected. There are two reasons behind this. The first is related to the accountability of the inspector as to how s/he will be responsible for 90% of the field which has not inspected. This contrasts with one of the objectives of QDS, under which the responsibility currently falls on the producer rather than the regulator. The second argument is that since the field is small, it does not make sense to visit only 10% of the field. For instance, seedling will often be in one shed, which an inspector can see once s/he reached the site. Similarly, potato fields are generally no more than 4 ha, so an inspector can easily evaluate the whole field. Thus, inspecting 10% of the field does not significantly reduce the burden from the regulator as intended.

Additionally, inspection procedures are often different across crop types. For example, potato field QDS inspection is conducted at the flowering stage and after harvest at storage, while that of certified seed is done twice in the field. For QDS certification of fruit seedlings, inspection is commonly done three times: (i) when studying the scion source, (ii) when checking for the establishment of rootstock, and (iii) after grafting and finally for certification, where number of disease free and well-established seedling is certified by number. Thus, there is no difference between formal seed and QDS in terms of certification processes.

C) Labelling

After inspection is completed, the regulatory authority provides a letter indicating that a given amount of seed/seedling has been certified, such as occurs with certified seed. Unlike certified seed, there is no provision of tags as part of the certification for QDS. Thus, unlike certified seed, there is no tag/label for QDS seed/seedling/tubers as such, although the Directive indicates that 14 parameters should be written on the tag. For buyers, who demand evidence of certification, often QDS producers will provide a copy of the seed quality certificate provided by regulator. In the case of seedling, growers often attach a tag indicating the variety name to a bunch of seedlings to avoid mixing of varieties. Similarly, if more than one variety of potato is loaded on a truck, producers often write the name of the variety on the bag to separate one from the other.

D) Certification fees

Payment requirements for the inspection services is not uniform across regions. Although in certain regions some producers do not actually recognize that they are paying for certification, regulatory authorities in the three regions studied and producers in some of the regions indicate that there is payment for certification services. Some of the producers in Oromia indicate that they pay 211.4 Birr/0.25 ha for inspecting potato seed. In Amhara, regulatory units require anywhere from 200 to 300 Birr/ha for potato certification. Similarly, respondents from Amhara's regulatory authority indicate that producers pay 300 Birr for seedling in one nursery for one crop and 600 Birr for two crops. QDS producers in SNNPR reported that there is no payment for the inspection service, whereas the regulatory authority reported that QDS producers pay a certification fee similar to that of certified seed producers. This potentially indicates that the payment is so small that the producers do not recognize it. In general, there is lack of uniformity among regulatory units, even within a given region, in terms of requested certification fees, which is related to how the regulation on fee is interpreted. This implies the need to standardize the payment considering cost recovery and assurance of quality QDS production.

E) QDS marketing practices

Seed/seedling/tubers certified through the QDS system are marketed throughout the country regardless of administrative or geographical boundary, although there is intention that it will only serve the locality where it is produced. Prior the introduction of the QDS concept, the central west part of Oromia was the major source of potato seed tubers throughout the country. That tradition still continued, except that they cannot sell through formal government channels to other regions. All QDS producers indicate that their customers are from all corners of the country. This is against the intention that sales of QDS should be limited to the production area.

Moreover, QDS marketing is generally undertaken without the use of tags, as these are not provided by the regulatory authority. Some potato producers indicated that selling QDS without official tags has affected the producers' market, as non-producers also supply uncertified seed tuber. Buyers who may be unaware can easily and unknowingly purchase uncertified seed because they often do not check the certificate, with the exception of those who buy to produce seed.

3.1.3 Improvement options

The assessment indicates that there is lack of uniformity in terms of understanding QDS as an alternative seed assurance system. The misconception started with the development of the Directive itself. The operationalization of the QDS system also has limitations, as the system has not been fully owned by the government, creating knowledge gap among seed sector stakeholders. There seems to be a lack of comprehensive understanding of the concept, as reflected in the Directive. The Directive is designed for local varieties registered through the QDS system, while there is currently no variety registered in this system. QDS producers are limited to farmers group/organizations, and more responsibility with regards to quality falls upon producers rather than the regulators. Although the existing Directive has not been fully implemented and a variability of understanding and implementation exists, current implementation is more flexible, allowing for the use of varieties registered outside the QDS system and for other producers to produce QDS. While QDS is a system to register local varieties produced by farmers groups, the absence of labels further affects its value, regardless of certification. It is thus important to focus on the following major points to operationalize QDS smoothly in Ethiopia.

- a) Awareness creation is important to institutionalize the QDS system in Ethiopia. This includes building a consensus on the importance of the system and building a common understanding to promote it as a complementary system to the full certification system. This also requires a government program specifically designed to institutionalize the system.
- b) QDS seed needs to be labeled not only to inform the buyers but also to ensure that QDS producers are appropriately compensated for the additional work they undertake as part of the QDS system and to promote QDS as quality assured seed. However, the label should be limited to the most important parameters rather than the current long list.
- c) Learning from current experiences, flexibility needs to be introduced to the Directive including, but not limited to, the type of producers, varieties to be used, labels, laboratory, and field facilities.

3.2 Seed packaging and labeling

Seed is cleaned and packaged based on the size that is pre-determined by the company. Yet the package size is almost uniform across both public and private seed companies in Ethiopia. Take, for example, wheat and maize, which account for more than 85% of the total seed supply of the country's formal seed system. The general package size for wheat is 50kg while that of maize is 12.5kg; a small proportion of wheat seed is also packed in 6.25kg to address the needs of smallholder farmers. Seed producers determine size of the package based on their market assessment of the segment that they want to serve. Given the poor market orientation of seed producers in Ethiopia, there is little effort to address smallholders' demand in terms of package size.

In Ethiopia, each seed lot is certified by the regulatory authority with its unique quality indicator. As part of the certification process, the regulatory structure ensures both the quality of the seed and that the container is labeled according to the regulation. A seed tag is a legal document that includes a label, which provides buyers with critical, verified information about the type and quality of seed contained within a package so they can make more well-informed purchasing decisions rather than relying on marketing claims. Producers labeling

certified seed must therefore be careful when considering what information to include on their respective labels and how they are attached to the seed container. Thus, packaging and labeling are very much linked to the certification process, which starts long before the seed is harvested. This section considers only the process after seed is harvested and focuses on the process of packaging, tagging, and labeling.

3.2.1 Regulatory provisions

Regulation 375/2016 provides details as to how the seed must be packed and labeled (FDRE, 2016). Article 31 of the regulation indicates that all approved seed should be packed and labelled between when the regulatory authority releases the test result and when it is supplied to the market. Article 26 of the regulation indicates that seed samples should be taken from processed seed arranged in lots. Moreover, the same Article also indicates that the label should not be removed before the seed reaches the final user (Article 31/3), and it asks farmers to keep the label, as they have to present the label if there is any issue that a farmer seeks to claim. To ensure that the label reaches the end user, it should be affixed or glued on the package so that it cannot be removed easily under normal use (Article 31/5). Besides being very useful information to the farmer, the Ethiopian regulation also demands that seed companies provide a description of the seed being sold. Labeling is done according to the Ethiopian standards, which includes the size, color, and content of the label. Moreover, Article 30 of the seed regulation lists information to be written on the tag. These are: (a) name and address of the organization; (b) certificate number; (c) crop type and variety name; (d) seed class; (e) reference number; (f) net weight of seed; (g) year of production; (h) date of sealing; (i) expiry date; and (j) warning text if the seed is treated with chemicals.

Regulatory provisions extend to the color of the seed tag as provided in Ethiopian Standard 481-2000. Four colors must be used to indicate different classes of seed, including:

- 1) Breeder/pre-basic seed – white with diagonal violet stripe;
- 2) Basic seed – white;
- 3) Certified seed, 1st generation – blue; and
- 4) Certified seed, 2nd generation or successive generations – red.

Not all seed that is packed and labelled will be sold in the same season and if there is carryover, the Ethiopian Seed Regulation specifies that the seed can be re-packed only with the approval of the regulatory authority. It must also be re-packed with a similar container (31/4).

3.2.2 Current level of implementation

A) Process of packaging and labeling

Given the regulatory provisions in Articles 26 and 31, the process of packing and labeling is very much interlinked, as seed must be tested before it is labelled. In Ethiopia, two tags are given by the regulatory authority to the producer, who prepares and labels the tags, one of which is affixed or glued on the seed container while the other is kept inside the bag. It is important to note that there is no provision in the regulation that forces the producer to attach its tag. The tag from the regulator is affixed to the seed bag externally.

In order to prepare these tags, both the producer and the regulatory authority have to take seed samples and conduct a laboratory test. Most of the producers take seed samples from raw seed before processing. They then clean manually and test for three parameters, including purity, moisture and germination. Conversely, the regulator takes a sample after the seed is processed and stored in lots as per Article 26 of the regulation. If the

test results of the producer fulfil the minimum standards, then the producer starts preparing the tag with the label as per the laboratory result and begins the seed cleaning process. Although there are country-wide standards for the three seed classes (basic, pre-basic and certified), the timing of tag provisioning by the regulator varies across the regional states. While the regulatory authority provides the tag after the test result is ready in both SNNPR and Amhara, in Oromia, the tag is given before the seed is processed. At the end of the cleaning process, one tag is placed inside the bag and the other tag is attached on the bag, both containing the same information. In Oromia, the tag from the regulator is also attached with the tag of the seed producer. While all others attach the tag and store the seed in lots immediately after cleaning, as they are already aware of their test results, we came across at least one union who takes sample after cleaning and kept the bag open until the test result is ready. It's important to note that this seed producer has sufficient space to keep the seed bags open, which is not the case for most of the seed producers; in fact, some producers use the processing plant on a rental basis and have to immediately transport the seed to their permanent storage facility and thus cannot keep the seed bag open until the test result is obtained.

In all cases, the producers store the cleaned and packed seed bag into lots of the standard size (e.g., 300qt for wheat and 400qt for maize). Once the seed is stored in lots, producers formally request the regulatory authority to take test samples. The regulator checks the lot size as well as the presence of company label and take test samples as per the standardized procedure. When seed is stored out of the indicated standard size, as is the case for some big producers, the regulator order them to re-package the lots before taking samples. The regulator conducts three tests similar to those undertaken by the producer. The regulator then informs producers of the results in writing and provides them with a certificate if the seed meets requirements. In both SNNPR and Amhara regional states, the regulatory authority also provides the tag to be attached to the seed bag of the specified lots that fulfil the minimum standards. Oromia regulators only provide the certificate at this time given that the tag is provided prior to seed processing, closely supervising companies so they cannot sell the seed before the result of the regulatory authority is ready although they already have the tag. There are a few exceptions, such as Meki Batu Union in Oromia, who attach both tags to the seed bag after the result of the regulatory authority is released, as seed samples are taken after cleaning.

As indicated in **Figure 3**, producers have to dismantle the lot, attach the tag, and rearrange the lot for storage; while this process previously cost around 16 Birr/Qt in the past, this figure has recently increased by 50%. This process is not only laborious, costly, and inefficient, but also difficult to execute given space limitations, particularly for those companies producing in the thousands of tons. Similarly, maize seed is often treated with chemicals, making it dangerous for the health of those who are manually performing the task.

In recent years, there have been efforts to change from a sewn to stitched tag to reduce the labor cost of sewing the second tag. In first-year trials, most of the stitched tags fell off during loading and unloading, which is related to the quality of the stitching material in addition to the fact that all seed bags are made of polyethylene and thus not suitable for adhesives. While Oromia reverted to the original sewn types following these trials, other regions tried to overcome the problem by stitching the company tag on the back side of the regulatory tag. This system started in Amhara and is now also taken up in SNNPR. Some small companies stitch the regulatory authority tag by dismantling the original lot. Big companies, on the other hand, assign additional workers to stitch the tag on the back of the other tag during the loading process. While companies have found solutions to reduce tag loss, other challenges remain – particularly issues surrounding labor requirements. Pressure to load trucks within a short time frame has led truck loaders to be primarily concerned with the number of bags they have loaded rather than ensuring the tag is properly attached to the bag that has, in turn, led to some bags being loaded without a label. The comparative sizing of the company and regulatory authority tags should also be considered and the size of the regulatory authority tag should not exceed that of the company's, given that this sometimes determines how the company tag is sewed on the bag. There have been

cases in which the majority of the company's tag is placed inside the bag, making it difficult to attach the tag from the regulatory authority. As indicated by one of the seed producers, companies are detrimentally impacted by relatively high costs, greater workloads, and inefficiencies because the regulatory authorities haven't enacted an improved system of tagging.

B) Tag color

As previously stated, the Ethiopian Standard 481-2000 designates different tag colors to serve as indicators of seed class. Despite the important implications of the colors, regulatory authority respondents have indicated that some companies tend to violate the standards by changing the tag color to misleadingly indicate their product is of higher quality. We have also come across a case where a company used the color of pre-basic seed for certified seed, which suggests that perhaps insufficient attention to tagging is provided by seed producers and operators in particular, and that they may be more concerned that the tag of the regulatory authority is attached to the seed bag than the whole purpose of the tag itself.

C) Seed Label

For seed buyers, information indicated on the tag is of primary importance. Seed is sold either by an agent or cooperatives and in both cases, they check to see if the seed bag has labels. This is especially critical for agents, as it affects the market and he/she has to provide assurance to farmers. Thus, they check to see if the tag is attached to the seed bag. Similarly, most farmers look at the tag; those farmers with no or low levels of literacy will often seek the assistance of others to read for them. There is widespread knowledge surrounding the importance of seed quality, especially surrounding variety names and germination. Farmers also pay attention to the name of company, given their historic knowledge or experiences with seed from a given company.

According to the Regulation, seed tag label contents should include the following components: producer name and address, certification number, crop and variety name, seed class, lot reference number, net weight, year of production, date of sealing, expiry date, and warning text if the seed has been treated with chemicals. In the past, the tag from both seed producers and the regulatory authority should have all this information. In addition to the list, they also include laboratory test results for moisture content, germination rate, and purity. Most producers claim that they write all information as a label on their tags; however, producers have stated that they often do not include information on 1,000 kernel weight and expiry date. In the case of 1,000 kernel weight, this is neither in the regulation nor on the regulatory authority tag; it is, however, included on the producer tag, though no one has included this information to present. As the regulatory authority has not fixed an expiry date for different crops, the producers do not indicate the expiry date on their tags. Rather, seed producers are cognizant that seed needs to be re-tested three months post-packaging prior to selling the product as seed.

Recently, a discussion on the regulatory authority's label contents has led to change on what must be included. Considering the difference between regulatory authority and seed producer test results, there was a decision to reduce labelling complexities so that the label must only indicate that the seed is certified by regulatory authority, as long as it fulfills the minimum standards. As a result, in SNNPR and Amhara, the tag only contains the address of the authority and a brief message indicating that the seed is certified. The authorities in Oromia, on the other hand, still require at least basic information to be included on the label, with the exception of laboratory test results. They justify this by emphasizing that the basic data is an important reference point. In practice, though, we came across a company in the region that has not written any information on the regulatory authority (**Figure 4c**), justifying this omission in that it is difficult to write on this tag because of the type of material used. Given the parameters, it was also observed that all the regulatory values seem to be copied from the company tag (**Figure 4a**). Regardless of the information, the fact that a tag from the regulatory authority is attached fosters the understanding that the seed is certified. There is no indication that the seed is certified,

though, on the Oromia regulatory authority tag. In a similar vein, regulatory authorities in Amhara and SNNPR provide a tag which only indicates that the seed in the bag is certified without giving further reference to the seed. While limiting laboratory information on the tag label may be good to avoid confusion, in both cases, the regulator is approving the result of the producer. As a result, whether the regulatory authority is responsible for the stated result is still an issue. For instance, the test result for germination from the company may show 99% and the corresponding figure from the regulator could be much lower at 87%. In principle, the seed could be certified as the minimum germination is 85%. But the buyer has the right to claim that germination rate is lower than what is written on the label, for which the regulator should be responsible, as they have approved what is written on the other tag despite their knowledge on the contrary prior to giving the certificate.

Differences in laboratory test results mainly stem from two challenges. The first is related to the laboratory capacities (i.e., human resource and physical capacities) of most of the seed companies. Knowing the capacity of the companies, respondents from the regulatory authority question the results from most of the companies. The second is related to the attention given by the companies, as there is no consequence if wrong figures are written so long as the regulatory authority test result is above the minimum. Such a lack of punitive action creates an incentive for companies to attract markets by providing an exaggerated germination percentage figure and potentially eradicating stakeholders' motivation to ensure the truthfulness and validity of the information contained on the labels.

D) Re-bagging /re-tagging

Although the figure has decreased over the past decade, some seed is left unsold annually. At the end of the season, seed producers report the amount of seed not sold to the regulatory authority. Moreover, the producers also report how they want to use it (i.e., as grain or seed). In both cases, the regulator carries out the following steps. If producers want to sell the material as grain, which is common for wheat seed to avoid storage management problems, the regulatory authority follows the process of selling to grain users. In Ethiopia, mainly maize seed is treated with chemicals since there is no chemical treatment for most other grain seeds (e.g., wheat). Maize can only be used for seed as long as it fulfills the minimum quality standard after re-testing. If the producer decides to use the material as seed, they request that the regulator inspects the seed and provides them with a new tag. The regulator often orders producers to re-clean and re-bag their product but, in some cases, they only order re-cleaning if the bag is damaged. Bag damage has become increasingly common for maize², so producers often re-clean and re-bag the seed. In both cases, the regulator takes a sample and re-tests the material; if it fulfills the minimum standard, then they provide the producer with an updated tag.

The producer must change the tag with the new label based on the updated result, including the updated testing year. The production year, however, remains the same to indicate that the seed is left over from the previous year. Since the tag has to be changed, it is mandatory to open the seed bag and pack it again manually. The major challenge in this process is the re-cleaning of chemically treated seed, as it both causes contamination and can make for a dangerous work environment.

² Weevil damage to maize seeds is becoming increasingly common, as leftover seed is collected back from different stores of agents, where there is high probability that one of these stores has weevils, which then infect all the seed that were collected back. There was a case where a few seed bags were kept in a big store and, after some time, the whole store was infected with weevils.

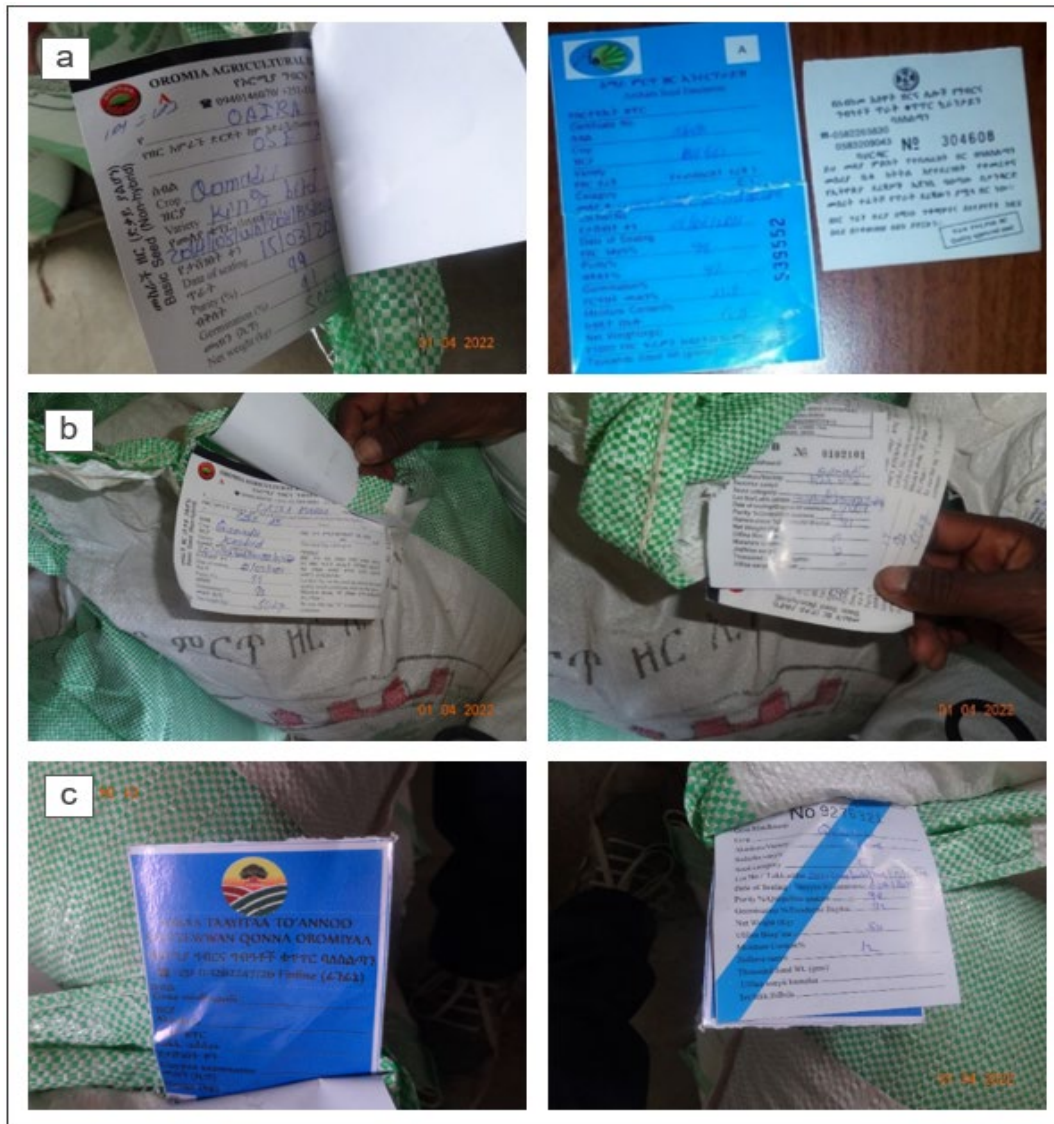


Figure 3. Seed tag labels from seed companies and regulatory authorities

3.2.3 Improvement options

A) Labeling

Currently, the regulatory authorities authorize the test results of seed companies, regardless of the accuracy of the values. In order to avoid confusion, tag labels should be limited to only those from regulatory authorities, as those from producers at times include contradictory information that makes it more difficult for the buyer to make an informed decision.

B) Tagging

The timing of sample collection and analysis was reported to be a major concern, as regulators want to ensure that they are certifying the seed that is going to be supplied to the market. Pre-existing efforts can be utilized as the basis for improved practices, as follows.

- a) For companies that may have space to keep the seed bag open until the test result is ready, it is possible to follow the normal process. In this case, the company can clean and keep the seed bag open until after regulator sampling and tag provision. The tag can then be attached without difficulty.
- b) Companies can alternatively clean and store seed in lots by keeping a tag that includes all information aside from the laboratory test result inside the bag. After processing, the company can sew on their tag with basic information and empty space for additional information. The regulatory tags could then be attached during loading after the test results are available.

C) Re-bagging

There is currently a lack of clarity as to when leftover seed should be re-cleaned, as the regulation only indicates that seed should be re-bagged with the decision of the regulator. The decision thus seems dependent on the inspector, but this should be based on clearly defined best practices. For instance, producers are sometimes requested to re-clean the seed if the bag is damaged. This practical approach could be standardized in order to avoid unnecessary cases of re-cleaning. The other problem associated with re-cleaning is the contamination levels of chemically-treated seed, which also affects the health of people working in the room. There is a need to stop re-cleaning of chemically treated seed, which is possible only through store management. Two important measures need to be taken:

- a) Companies should have a separate storage area for any left-over seed. All seed that has been collected back from selling points should only be stored separately, so that it does not contaminate the store of the company.
- b) All storage areas with seed that has not been sold in a season should be fumigated as early as possible in the presence of regulatory authority to avoid any damage to the seed and the need for re-cleaning and re-bagging. The regulatory authority needs to inform seed companies that they will not take seed samples from storage that is not fumigated.

3.3 Seed marketing dispute settlement processes

Seed marketing is sidelined in the regulatory frameworks. There was no mention of marketing in the Seed Law 782/2013, unless the term “seed distribution” was used to refer to “seed marketing”. The more recent seed policy working document, however, indicates the need to create a competitive market-based seed sector. Similarly, there was no regulatory article against seed marketing until the Seed Marketing Directive (001/782/2011) was developed, which aims to clarify the roles and responsibilities of different actors and the process of seed marketing. The Directive recognizes not only the long and inefficient chain used by government, but also the lack of accountability and government costs incurred in facilitating the distribution process. The Directive introduced the concept of Direct Seed Marketing (DSM) within the Ethiopian context, emphasizing the importance of DSM in overcoming these and other challenges faced.

Currently, about two-third of the seed is sold directly by the producers, while the remaining one-third still goes through the distribution system. In the case of distribution, the government allocates seed to districts and district unions; in some cases, the district office will buy the allocated seed to sell to farmers. Given the diversity of agro-ecological systems in Ethiopia and thus the market potential for seed, seed distribution through government support, regardless of its size, will continue to exist. However, despite the importance of regulating seed marketing to ensure that seed available on the market is not fake/adulterated and/or sub-standard, regulatory authorities continue to prioritize the topic of seed certification.

As a result, seed marketing issues – particularly those related to poor seed quality – have led to disputes among actors across Ethiopia. The existence of these disputes is an indication of the poor performance of the certification process, as well as trustworthiness of actors involved in seed marketing. With the emergence of direct seed marketing and the operationalization of seed agents in many areas, the extent of disputes due to seed quality problems is reported to be on the decline. Disputes that do arise must be settled in accordance with existing regulation in order to protect consumers and hold supply-side actors accountable.

3.3.1 Regulatory provisions

The existing regulation presents clear procedures for buyers to issue formal complaints against producers in the case of poor quality or fake seed and describes the subsequent dispute settlement process. Seed Proclamation No. 782/2013 indicates that complaints regarding fake seed require the case being taken to court. The penalty for the supply of fake seed is outlined in Article 26 of the Seed Law (782/2013), whereby any person who supplies uncertified seed, claiming it to be certified, to the market will be sentenced to 5-10 years of imprisonment and fined 50,000 to 100,000 Birr. Similarly, the Article states that any person who supplies seed to the market without a label will be imprisoned for 3-5 years and will be fined 30,000 to 50,000 Birr.

Provisions indicate that complaints and disputes between seed producer and agent/dealer are required to be settled as per their negotiation contract agreement, mediation by third party indicated in the contract, and, if still unsolved, should be done through court. Provisions in the Seed Marketing Directive (001/782/2011) under Articles 7 and 8 indicate clear procedures as to how farmers and agro-pastoralists’ complaints need to be settled (Figure 5).

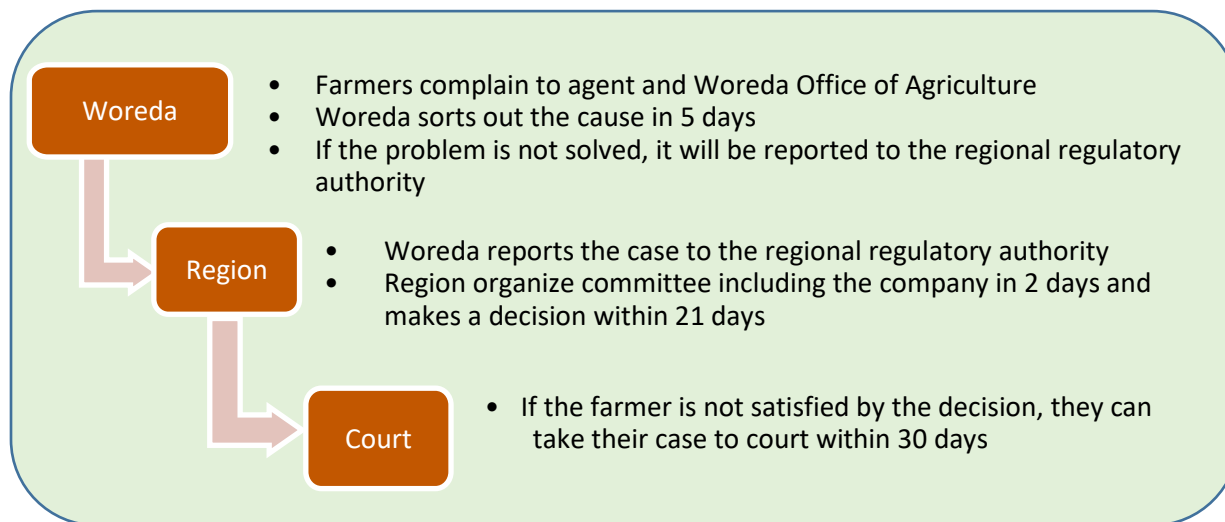


Figure 4. Procedures of farmers’ complaint settlement in the seed marketing

3.3.2 Current level of implementation

Even though the Seed Marketing Directive clearly indicate the procedures, the existing practices in addressing farmers’ complaints are quite different across regions. Similarly, fake seed control is not to the expected level and fake seed is still a problem in some hot spots.

a) Practices in farmers’ complaint reporting and settlement

Seed quality issues derive from a number of factors including the management of seed in store, which is a common problem of cooperatives operating within the seed distribution system, the extent to which regulators and producers are serious about certification, and the seed transport system. The assessment indicates that there is an increasing level of awareness among farmers surrounding complaint reporting and dispute settlement provisions. However, there are still farmers who are unaware of the procedures and mechanisms to present complaints. As a result, the problem of seed quality is often raised during different meetings whenever opportunities exist in cases where the problem is not serious; companies often improve their performance based on such feedback.

Common practices in reporting complaints by farmers include either directly complaining to the agents who sold the seed or to development agents in the area. Farmers' complaints are reported either before or after planting. Complaints that are reported before planting are generally related to (i) the presence of broken and/or small-sized seeds, (ii) underweight seed bags, and (iii) uncleaned seed. These often-visible concerns are easy to report, and complaints are generally easily settled. Farmers tend to fix issues themselves rather than complaining when possible (e.g., cleaning uncleaned seed). However, the issue will be raised in various forums whenever there is an opportunity. Agents often attempt to address complaints shared with them directly before planting immediately, especially in areas where agent systems are strong. This process begins with the agent assessing the problem derives from the seed itself or from another issue. Once confirmed the issue stems from the seed, they then inform the company to take measures. Some companies also give due attention to the complaints of farmers and make sure that their agents inform them immediately if there is a problem. Unfortunately, it is also not uncommon that such complaints are ignored, particularly when the seed is distributed through the conventional system.

Complaints after planting are often those related with the germination of planted seed and/or poor performance as it approaches full maturation. Post-planting complaints are often far more complex, as other factors beyond seed quality (e.g., agricultural inputs used, agronomic practices performed, natural events) impact field germination and crop performance, and can be further complicated by the timing of reporting. If a disagreement arises between a farmer and agent related to the cause of the problem, the *woreda* organizes a team in which the agents are part to investigate the problem. Should a consensus be reached on the cause of the problem, the dispute settlement process is straightforward; however, if there is disagreement amongst investigatory agents, then the issue will be taken to the regional level.

The existing experiences related with post-planting seed quality complaints are commonly associated with sub-optimal field management practices, including the improper timing of planting, poor storage of purchased seed, and, in some cases, pest incidences during germination. If, after planting, complaints are to be properly addressed, adequate information and data on farmers' production practices, weather patterns, and pest incidences is needed, which is often challenging under the current capacity and existing data management system. This creates room for subjective evaluations to be made when addressing farmers' complaints. However, the assessment indicates that post-planting complaints have been addressed through negotiation among concerned actors, as was the case of malt barley seed in North Shewa zone of Amhara region. In this instance, farmers' seed quality complaints were determined to be the result of poor field management as agreed upon through discussions with the seed producer (Tegulet Seed Cooperative Union) and the zonal and *woreda* Offices of Agriculture.

Valuable insights can be gathered from cases that have been taken to court, which are common in Amhara. For example, **Box 1** below offers an example in which farmers from Amhara took a seed supplier to court. In another Amhara case, farmers took the *woreda* Office of Agriculture, who distributed the apple seedling in question, to court. Upon investigation, it was determined that a portion of the seedlings the producer supplied were uncertified, as the regulator only certified 6000 seedlings, while the producer supplied 8000 seedlings. The

verdict of the court was that the supplier was guilty of supplying uncertified seedlings. While a comprehensive analysis of all related disputes falls beyond the scope of this study, these cases provide promising evidence that (i) farmers in Ethiopia often feel empowered to seek compensation when seed they've purchased is fake or of poor quality and tend to use the legal protections afforded to them appropriately and (ii) codified dispute settlement systems and processes are being utilized and have been effective.

Box 1. Farmers took government office to court

In Amhara, an incidence arose whereby certified chickpea seed planted by farmers performed poorly failed at the germination stage. As a result, farmers took the *woreda* Office of Agriculture, who supplied the seed, to court. The *woreda* replied to the court stating that a farmers' cooperative union was the seed supplier and that the union is responsible for any seed-related issues. The court accepted the argument of the Office of Agriculture and allowed the union to respond to the case. The union also responded in stating that they sourced the seed from the Amhara Seed Enterprise, which should take responsibility for any seed-related issues. Accordingly, Amhara Seed Enterprise was asked to respond to the case. The enterprise responded stating that the seed as the seed was certified by the regulatory authority and there should therefore be no issues. The authority also provided the evidence that the seed was certified, and remaining sample is in the lab and can be re-tested. The court decided that the remaining sample should be tested by third party. Accordingly, the seed was tested by third party and the result again confirmed that there is no problem with germination of seed. Finally, other factors were investigated for the cause of the germination failure. Two issues were identified:

1. The seed was planted while it was raining, and chickpea should not be planted during rainy time; and
2. The specific location was a waterlogged area unsuitable for chickpea production.

Given these findings, the Office of Agriculture was found at fault, as it had provided inaccurate planting advice to farmers in terms of timing and location and was ordered by the court to compensate farmers for their financial losses.

Source: Amhara regulatory staff interview

b) Disputes between seed producers and agents

Disputes between seed agents and seed producers are reported to be very rare, as both operate on a business relationship. When seed quality disputes arise, they act as one and address the challenge. The main areas of dispute/complaint between agents and producers are reported to be (i) the size of commission the seed producer pays to the agent, (ii) the volume of seed the producer supplies to the agent, where agents often demand more seed while the seed producers consider local demands in relation to other areas of operation, and (iii) the varietal composition of the seed supplied to the agent, where agents mostly opt to have only seeds of those varieties for which there is high demand. Producers' also raise issues with agents related to timely depositing of cash from seed sales. Seed producers try to closely follow seed transactions during marketing season to ensure the agent deposits cash on time.

c) Operationalization of regulatory provision with regards to fake seed

The assessment indicates that fake seed marketing practices are common in some areas and unknown in their areas. It is mainly common in major maize production areas but not common in wheat production areas. Moreover, fake seed is still common with some specific varieties. In particular, it is more common for hybrid maize varieties from Corteva, mainly related to the high demand for these varieties. This, however, does not mean that no problems exist with other hybrid varieties but, rather, indicates a frequent prevalence in this instance. There have also been some reports of fake vegetable seed. Conversely, there are almost no fake seed reports for self-pollinated grain crops. Fake seed is often practiced in manner where the certified seed bags are

reused to package grain seed treated with chemicals so that the packed grain seed looks like the certified seed in color and overall appearance.

The main challenge associated with fake seed is the limited reach of regulatory agents, who are responsible for controlling fake seed, since there is no organizational structure at the *woreda* level. The regulator often has few regional branch offices (e.g., four in Oromia, three in SNNPR, four in Amhara) that lack the capacity to cover the entire region. Recognizing this limitation, there is an effort to promote local-level control of selling fake seed and other agricultural inputs through the establishment of committees at *woreda* and *kebele* levels in Oromia. These committees are generally comprised of stakeholders who have various roles in issue resolution (e.g., the Office of Agriculture, Cooperative Promotion Office, police, *woreda* or *kebele* administration, legal offices, regulatory offices).

Another challenge is that perpetrators of fake seed marketing and proliferation are not always legal actors engaged in seed production and marketing. These are often opportunistic individuals who use the shortage of certified seed and associated increased demand as an opportunity to exploit. Given the limited surveillance, controlling such actors is reported to be challenging. However, the assessment indicates that there are examples of legal measures taken due to fake seed marketing. In Oromia and Amhara, a local seed trader who attempted to market fake seed was taken to court in Oromia and sentenced to six years of imprisonment. Similarly, a trader found selling fake seed in Amhara was sentenced to three years of imprisonment. Another seed producer in Oromia, who was found marketing seed without certification, lost CoC for certified seed production. This indicates a positive emerging trend of actions undertaken to control fake seed distribution in the country.

3.3.3 Improvement options

Improving the operationalization of the provisions in efficiently addressing dispute settlement among actors engaged in the seed marketing demands addressing the main challenges behind such disputes, such as shortages of certified seed of demanded varieties and limited knowledge of farmers' rights.

Both short- and long-term solutions are needed to minimize the marketing of fake seeds. Key short-term solutions include identifying hotspot areas and increasing surveillance. Given the limited presence of regulatory authorities, scaling Oromia's stakeholder structure should be considered. Key to this structure are organized agricultural inputs councils/committees at the *woreda* and *kebele* levels, comprised of relevant seed actors that control the marketing of illegal agricultural inputs including fake seed. Strengthening the tagging system and increasing farmers' awareness regarding authenticated source of seed as well as authenticated tag is also important. Farmers should be able to differentiate authenticated from fake seed labels through awareness creation. Longer-term solutions should focus on increasing the availability of those demanded varieties (e.g., by increasing the availability of early generation seed and supporting seed producers to increase the supply of certified seed).

Improvements are needed to more effectively address farmers' seed quality complaints. These should start by increasing awareness of farmers' rights and the process for presenting complaints. Perhaps the most effective way of doing this is including such information on the seed bag. Additionally, all seed producers should disseminate a leaflet containing this information written in local language during the time of seed purchase. These are easy, relatively low-cost means of increasing farmers' awareness while indirectly alerting seed producers that they should improve seed quality and that they are potentially held liable if their sold seed is deemed to be of poor quality. Seed producers and others involved in seed marketing/distribution should also be made aware of the extreme court case examples to further deter any illicit seed activity.

4 Conclusions and Recommendations

This paper assesses the extent to which of the Ethiopian seed law, regulations, policy, and directives have been operationalized. The assessment indicates that there are gaps both with the regulation as well as in the operationalization of the different seed regulatory provisions. Such gaps are expected in the seed sector of Ethiopia as developing and implementing regulatory framework is only a recent phenomenon and are coupled with changing political and economic policies.

The regulatory domains examined in this assessment reveal that there is a focus on theoretical precision rather than the practicalities of implementation. Logistical and management processes are not always taken into consideration in the development of the regulatory frameworks and directives. As such, some of these regulations emphasize control rather than facilitative processes, making it hard for actors to comply. Reflecting the difficulties of regulatory compliance, different regions implement standards in various ways. These differentiated approaches provide learning opportunities that can be taken to and applied by national and regional governments. However, this requires the establishment of feedback and learning mechanisms to ensure the timely adaption and change in design and/or implementation of polices, regulations, and directives. It is also critical to engage all actors in the process to make sure that experiences and ideas of actors are considered in the feedback and learning mechanism.

The theoretical focus and control mentality while developing regulation is also very much related to the less developed seed market in Ethiopia. Liberalizing the seed market, with strong support for increasing production, intensify competition. As quality is a key parameter of competition within the seed sector, companies will then work towards supplying good quality seed so as to remain in the market. In doing so, companies establish their brand and customers build trust in seed producers rather than the label attached to the seed bag. Thus, while short-term approaches to ensuring regulatory compliance [through technological innovation and workflow changes] is useful, long-term development of the seed market through gradual liberalization is critical.

Seed law and regulation awareness levels were found to vary across the different provisions. As a result, the current variability in implementing provisions creates greater flexibilities than those which currently exist within the various provisions' text. In addition to inconsistent awareness of seed law and regulation, there seems to also be a limited understanding of their intentions. An example is QDS, as the related directive limits its production to local varieties although, in practice, released varieties have been used. This also raises a question as to what extent regulatory frameworks are critically designed and deliberated on, calling for the revisiting of some of the regulatory frameworks.

These results clearly indicate the need to (i) consider the practicality in the design of the different regulations and directives, (ii) ensure adequate awareness to all relevant stakeholders, (iii) develop feedback and learning mechanisms intended to facilitate learning across regions and for timely adjustment/revision, and (iv) ensure technical and human capacities.

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