AGRA
Sustainably Growing Africa's Food Systems

ETHIOPIA

Seed sector strategy & investment plan

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Acronyms

AGRA	Alliance for a Green Revolution in Africa
ARARI	Amhara Regional Agricultural Research Institute
ASE	Amhara Seed Enterprise
ATI	Agricultural Transformation Institute
CGIAR	Consultative Group on International Agricultural Research
CIMMYT	International Maize and Wheat Improvement Center
DUS	Distinctness, Uniformity and Stability
EAA	Ethiopian Agriculture Authority
EGS	Early Generation Seed
FCU	Farmer Cooperative Union
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ICARDA	International Center for Agricultural Research in the Dry Areas
IQQO	Institiutii Qorannoo Qonna Oromiyaa/Oromia Agricultural Research Institute
ISTA	International Seed Testing Association
MoA	Ministry of Agriculture
NVRC	National Variety Release Committee
OSE	Oromia Seed Enterprise
PBR	Plant Breeder's Right
RBoA	Regional Bureau of Agriculture
SARI	South Agricultural Research Institute
SNNPR	Southern Nations, Nationalities and People's Region
SoPPARI	Somali Region Pastoral and Agro-pastoral Research Institute
TARI	Tigray Agricultural Research Institute
PVP	Plant Variety Protection
SeedSAT	Seed Systems Assessment Tool
TASAI	The African Seed Access Index
VCU	Value for Cultivation and Use

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Executive Summary

The Ethiopian seed sector has the potential to produce improved seed for priority crops thereby enhancing food security and improving livelihoods for smallholder farmers. The Ethiopian government has been at the forefront in leading the reforms to the sector as witnessed by an evolving pluralistic policy environment that is aligned with regional and international conventions. With an already well-established Ethiopian Institute of Agricultural Research along with the Regional Agricultural Research Institutes, the country can produce improved varieties adapted to the challenges posed by climate change and an ever-increasing human population.

On the policy environment front, the establishment of the Ethiopian Agriculture Authority and recently approved proclamations mark a major turning point in the evolution of the formal seed sector in Ethiopia. The existing parastatal seed enterprises, cooperatives and private seed producers and small agro-dealers network provide opportunities for smallholder farmers' access to the improved seed of priority crops.

In recognition of the problems facing the seed sector, the Ethiopian Ministry of Agriculture developed the Seed System Development Strategy, the Seed Sector Transformation Guidelines, and Ministerial level Seed Policy. Further, several efforts/interventions have been undertaken to increase the production and supply of seed to contribute to the growth of the agriculture sector in particular, and economic development of the country in general. Although the interventions have contributed to some remarkable changes in the seed sector, they have been piecemeal and have not solved the systemic challenges in the seed sector in an integrated manner.

This seed sector strategy and investment plan is informed by recent developments in the Ethiopian seed sector covering (i) recent in-depth studies, (ii) on-going initiatives, (iii) the emerging changes in the policy environment, and (iv) existing seed production and distribution arrangements. It analyzes challenges and constraints, as well as highlighting the priority interventions to be implemented in the medium term to propel the Ethiopian seed sector forward. The key priority investment areas fall under six key components: 1) National Agriculture Research and Breeding Effectiveness; 2) Early Generation Seed Production and Distribution; 3) Commercial Seed Production and Marketing; 4) National Policy, Legal and Regulatory Framework; 5) National Quality Assurance; and 6) National Planning and Coordination. The strategic interventions identify the constraints that need to be addressed, specify the activities that need to be undertaken, and identify the entities that will lead the efforts and the expected results.

The interventions identify policy-oriented activities that require designing the appropriate policy measures, policy makers' decisions, design of implementation procedures (regulations and directives), and ensuring their implementation. The interventions also identify development activities that require investment in infrastructure, physical facilities, human resource development, and systems development.

In summary, the development of a strong seed sector requires coordinated effort between the public and private sectors, where the roles may differ across the seed value chain (variety development, seed production, and marketing). The public sector needs to invest more in plant breeding and the development of new and demanded varieties, particularly for open-pollinated/self-pollinated crops/varieties of staple food and strategic crops, for example, Wheat, Teff, Barley, Rice, Pulses and Oil crops. Private seed companies must be supported with an enabling policy environment to promote efficient seed production and marketing practices. Such a conducive environment includes a clear/simple legal framework to have access/license public-sector germplasm, streamlined varietal release policies, and reliable genetically pure early generation seed supply, regional harmonization of seed regulations, capital/finance access and implementing transparent and efficient regulatory system with strong financial, infrastructural, and human capacity to carry its regulatory functions.

The key strategic interventions by component along with expected outputs and resource requirements are presented in Table 1:

Table 1: *Strategic interventions, expected results and budget by component.*

Component	Bottlenecks	Strategic intervention	Expected output	Financial resource (USD)
National Agricultural Research and Breeding Effectiveness	Research efforts inadequately aligned with government priorities and demands of stakeholders.	Revise the national crop improvement program strategy.	Functional and efficient national agricultural research system established.	5,130,608
	Weak human resources capacity due to poor training, recruitment, and retention system.	Competitive research human capacity building.	Motivated with required skills, scientific staff in place	
	Poorly funded facilities, staff, and research program.	Development of required research infrastructure.	Developed research infrastructure installed.	

Early Generation Seed Production and Distribution	Inefficient and poorly organized early generation seed supply system.	Develop and implement strong staff incentive, Ensure a functioning quality assurance .	A robust and quality early generation seed production and supply system institutionalized.	19,538,720
	Limited infrastructure, logistics, and operational budget.	Invest in physical facilities for early generation seed production.	Capacity of early generation seed production enhanced.	
	Absence of suitable business models, such as variety licensing, public-private partnership.	Commercialization of public varieties.	Improved access to EGS of demanded crops and varieties.	
Commercial Seed Production and Marketing	Restrictive enabling environments, lack of transparent playing field for private and public seed companies.	Ensure the implementation of the seed policy to enhance a competitive seed sector. Promote an equitable access to early generation seed.	Available good seed business environment.	16,964,022
	Restrictive policies promoting high transaction costs, lower incentives to investment.	Promote international investment to enhance commercial seed production.	Strengthened foreign investment and transfer of know-how and technology.	
	High cost of entry to operate for small-and-medium seed companies limited access to financial services.	Promote market led seed production and marketing for public seed enterprises and seed coops.	Market oriented seed sector .	
	Limited seed business skills technical capacity for organizational and financial management.	Promote professionalization of seed business management.	Skilled manpower available for vibrant seed sector.	
	Lack of legal support to organize out growers as organized seed business models.	Support the role of public sector for seed production of less profitable crops..	Availability and access for seed of less profitable crops enhanced.	
Policy, Legal Regulatory Services	Testing requirements not customized by crop, discretionary approval criteria, and institutional weaknesses.	Building institutional capacity and resources to conduct Distinctness, Uniformity & Stability and Value for Cultivation and Use tests for the execution of Plant Breeder's Rights and Variety Registration.	National capacity built for proper execution of Plant Breeder's Rights and Variety Registration.	7,392,624
	Limited agricultural financing sectors and loan guarantees.	Mobilizing funding for public institutions, including both national and regional research institutes and regulatory authorities.	Public institutions capacitated to play expected role.	

Quality Assurance System	Limited capacity in technical, infrastructure, logistics, and operational budget.	Ensuring full quality compliance and operationalization of Quality Assurance function across the seed classes.	Full operationalization of digitalized quality assurance system.	7,392,624
	Inadequate organizational setup limiting the chance to attract more qualified and experienced staff.	Develop required human and physical capacity for quality assurance.	Required number of professional staff made available and physical capacity/ infrastructure built	
National Planning and Coordination	Lack of institution responsible for administration and implementation of seed policy.	Established functional seed sector governance structure.	Effective national seed sector coordination mechanism established.	8,590,668
Total				**65,009,264**

Section 1:

Introduction

Justification for the National Seed Sector Strategy for Priority Crops and Investment Plan

- Incompleteness of existing national strategies: This strategy is intended to cover all the aspects of a seed system of priority crops, that are elaborated in the six thematic areas of SeedSAT. Some of the existing national seed strategies do not cover all aspects of the seed value chain, leading to key industry gaps not being addressed.

Vision and mission of the National Seed Sector Strategy for Priority Crops and Investment Plan: According to the SeedSAT report for Ethiopia[1] (DAI 2021) *"the overall vision of a healthy seed system is one in which farmers grow modern varieties of crops that have product profiles that are responsive to market and consumer demands that are also adapted to their environments to ensure resilient and high yields. It is also a system that includes*:

- A regular supply of domestically bred and imported crop varieties at a pace that matches market demand and that gives farmers choices
- Healthy competition among public and private producers at the various stages of seed production to supply the market that are accountable for quality standards
- An appropriate blend of public and private engagement AND investment to ensure that early-stage and food security crops that are not yet profitable are not neglected
- Seed subsidies (if used) are used carefully to temporarily bridge new market development and market failures for short periods.

The vision of the Seed Sector Development Strategy 2013-2018[2], is a well-functioning seed system that enables all farmers (women, men, and youth) to access seed of improved varieties of the right quality, quantity, at the right time, and price, from a range of producers and distribution channels to increase production and productivity.

The critical underpinning factors to enabling this vision are:

- **The effective development, release, and registration of demand driven varieties.** The goal here is to effectively develop and release varieties that meet farmers' needs; be it yield, disease resistance/tolerance, or other traits related to the value chain. Strong, well-resourced, self-sustainable research institutions are essential for developing and maintaining varieties, as are independent regulatory structures to register and release these varieties.
- **Clearly delineated roles of public and private producers in the formal sector.** Each type of producer should operate in a domain in which it has a relative advantage while meeting the needs of farmers. The private sector has had a strong track record in opportunities such as hybrid maize seed and other types of high-value crops such as horticulture, largely driven by the relatively higher margin of these crops versus self-pollinating varieties (SPVs). Given this, the mission of the public entities should be to fill gaps that private companies are less likely to fill, namely SPVs such as wheat and teff, and geographies that the private sector cannot reach.
- **A vibrant market environment that enables both public and private producers to produce, market, and distribute seed effectively through multiple channels.** Ideally, seed producers should have both accountability for and the incentives to produce high-quality, high-performing seed. Through Direct Seed Marketing (DSM), Ethiopia could have a system by which seed producers directly market their seed to farmers through multiple channels, which would foster healthy competition after receiving the necessary certifications, and lead to greater choice and value for farmers.
- **Structures that ensure quality at all stages of the seed system**. As the seed system grows in terms of quantity as well as the range of producers participating, quality control becomes paramount. To enable this, regulatory mechanisms ranging from field inspections to laboratory tests are essential. As the sector evolves, the goal is that producers and distributors would naturally be incentivized to maximize quality as they directly bear the associated risks and rewards through increased farmer demand for high-quality seed.
- **Robust intermediate sector that decentralizes seed production and distribution while maintaining effectiveness.** Community-based seed production and distribution enables easier access to seed and builds local economies. The goal is to effectively support community-based producers so that they can be transformed into independent, self-sustaining seed enterprises that address local needs. In particular, the goal of community-based seed production is to satisfy needs and demands in self-pollinating crops and geographies; while the formal public sector should focus here, there are still significant gaps that could be satisfied by community-based seed production. It is critical to ensure that quality and other critical parameters - timeliness and choice - are still satisfied in this system.

1 DAI 2021. Seed Systems Assessment Tool (SeedSAT) Country Assessment Results – Ethiopia.
2 FDRE and ATA. n.d. Seed System Development Strategy. Vision, Systemic Challenges, and Prioritized Interventions.

Under the ten-year development plan (2021-2030)[3], agricultural sector reform aims to increase, among others the role and participation of the private sector, improving supply of inputs and finance, and promoting import substitution for major agricultural crop production. The plan envisages increasing the national average productivity levels for maize, wheat, and teff to 69.33 qt/ha, 51.99 qt/ha and 28.3 qt/ha, respectively. To achieve this, the plan is to increase the supply of improved seeds from 1.09 million quintals to 2.3 million quintals.

In addition, by 2020, public seed enterprises supplied about 40% of the total national seed requirement by volume, which covered only about 20% of cultivated land[4]. This makes a case for diversification of seed production and inclusion of private seed companies. Currently, their contribution to national seed production is about 10% for grain crops (predominantly hybrid maize), and none of them produced more than 550 tons in 2018/19 production season. The low participation of domestic private seed companies in the Ethiopian formal seed sector emanates from policy issues, capacity and capability limitations of the companies, minimal external support as well as a lack of a level playing field in basic seed allocation and price setting relative to the public seed enterprises.

This seed strategy and investment plan operationalizes increasing production of improved seed and increasing contribution of private seed companies to at least 50% by 2030.

The general objective of the Ethiopian comprehensive seed sector development initiative (Ministry of Agriculture, 2020) is the transformation of the national seed sector for enhanced contribution to increased agricultural production and productivity, food security, supply of required raw materials for emerging domestic agro-industry, import substitution, and export performance.

The specific objectives are to: "**Development of a competitive and vibrant seed sector that ensures the availability of quality seed of demanded crop varieties at the required time, place and competitive prices to smallholder farmers, agro-pastoralists and commercial farms through**:

- Strengthening the availability of EGS of demand crop varieties for adequate production of certified seed;
- Increase seed production capacity of seed producers to ensure the availability of seed for farmers;
- Enhanced performance of seed marketing system to ensure efficient delivery of seed;
- Strengthening the national seed regulatory and certification capacity to ensure the availability of quality seed;
- Promoting seed as businesses to exploit Ethiopia's opportunity to enter the global seed market; and
- Strengthening the national seed coordination and leadership capacity and performance"

These objectives are supported by the aspirations of the Seed Policy 2020[5] and hence they apply to this strategy and investment plan.

Table 2 presents the annual seed requirement, quantity of seed produced in 2020/21 and target utilization of seed by 2025. The target utilization by 2025 is based on the annual seed requirements, quantity of seed produced in 2020/21 and the utilization of seed for the four crops where data are available. The target utilization by 2025 for the maize, wheat, teff and sorghum range from 10% (for sorghum) to 70% (for maize).

Table 2: *Annual seed requirement, quantity of seed produced in 2020/21 and target utilization of seed by 2025*

Crop	Annual seed requirement (MT)	Quantity of seed produced in 2020/21 (MT)	Current estimated utilization of seed	Target utilization by 2025
Maize	52,237	30,747	59%	70%
Wheat	81,569	39,533	48%	60%
Teff	23,230	2,976	13%	30%
Sorghum	13,595	284	2%	10%

Strengthening of national seed regulatory and certification capacity will be catalyzed by increased funding to public research institutions and the newly created Ethiopian Agriculture Authority (EAA). This strategy will enhance the operational capacity of EAA.

Currently, the responsibility of coordinating seed sector matters is split between the three directorates within MoA and the Regional (RBoA). Establishment and strengthening of a national coordination mechanism will ensure that seed sector matters readily get their due attention.

Methodology

The development of the seed sector strategy was preceded by two broad steps:

3 Federal Democratic Republic of Ethiopia 2020. Ten Years development plan. A pathway to prosperity 2021-2030. Planning and Development Commission.
4 Ministry of Agriculture. 2020. Ethiopian Comprehensive Seed Sector Development Initiative
5 Ministry of Agriculture. 2020. National Plant Seed Policy. Ministry of Agriculture. Addis Ababa, Ethiopia

Country SeedSAT assessment: The Seed Systems Assessment Tool (SeedSAT) is an assessment tool to collaboratively undertake in-depth country seed system analysis with governments and other stakeholders leading to improvements that increase the delivery and use of improved varieties of seed. The tool is intended to leverage, not duplicate, the information aggregated from existing resources and assessments and add additional subject matter expertise to identify the root cause of deficiencies and inefficiencies and prioritize seed system modifications and investments with strong business cases to raise internal and external funding.

Stakeholder validation of SeedSAT country report: Following the completion of the assessments, Ethiopian Seed Systems professionals (as indicated in the list of contributors) in collaboration with the government and the Alliance for a Green Revolution in Africa (AGRA) country office, convened a workshop to validate the findings of the assessment. The stakeholders reviewed and critiqued the recommendations, the priority interventions, and the proposed cost estimates.

The Seed Sector Strategy and Investment Plan is informed by the results of the SeedSAT assessment together with key existing industry documents, namely the Seed Sector Development Strategy and the Ethiopia 2021 Country Report by The African Seed Access Index (TASAI).

Scope of this strategy

The Ministry of Agriculture (MoA) developed the Ethiopian Seed System Strategy for 2013 to 2017 which highlights the major bottlenecks and proposed intervention activities across the seed value chain in the formal, intermediate, and informal sub-sectors.

The MoA endorsed an additional document titled "Current Status, Major Challenges, and Strategic Options for Transforming the Ethiopian Seed Sector, A Guiding Document" in 2019. The document is basically aligned with the strategy but contains additional recommendations or approaches on seed sector revenue generation and re-investment and seed sector coordination.

The SeedSAT study has identified key gaps and prioritized recommendations for intervention in the seed system, across eight thematic areas. As a follow-up of these recommendations, this document, referred as the" **Ethiopia seed sector strategy and investment plan for prioritized crops**" has been developed by AGRA/TASAI and by a team of Ethiopian seed systems professionals. This document focuses on the seed value chain of prioritized crops identified by the SeedSAT that includes the four major cereals as well as pulses, horticulture, and oil crops.

The budgetary requirements for the implementation of this strategy and investment plan for a **period of five years** is estimated to be USD **65,009,264** (Table 10). The government is expected to cover 30% while development partners/donors will cover 70% of the total cost.

This budget considered the USD **133,034,566** budget prepared by the MoA and the Ethiopian Agriculture Authority (EAA) for the implementation of the mega project that proposed to transform the Seed Systems of selected priority 10 crops in 10 years referred to as 10 in 10 (Table 9).

Section 2:

Background - status of agriculture and the seed sector in the country

Agriculture is the dominant sector of Ethiopia's economy, contributing nearly 34.5% of GDP, 80% of employment, and over 80% of foreign exchange earnings. Transforming agriculture is dependent on a well-functioning seed sector. A well-developed seed sector is one of the essential requirements to boost crop production and productivity, thereby contributing to food security and economic development. Although established five decades ago, the Ethiopian formal seed sector is still constrained by institutional, organizational, technical, and infrastructural factors to sustainably ensure access of smallholder farmers to quality seed; especially in terms of responding satisfactorily to the increasing demand from diverse agro-ecologies and farming systems of the country as well as market requirements. Thus, it is high time to ensure the transformation of the seed sector and enhance its effective contribution to the development of Ethiopian agriculture.

The seed sector in Ethiopia is guided by a comprehensive seed sector development strategy.2 The Ethiopian Seed policy 2020 that was approved at the ministerial (English and online versions are not yet available) sets the framework for seed sector and wide-scale use, including the roles of public and private entities. It builds on the 1992 Seed Policy that defined strategies for seed sector development and balancing both public and private sector interests. The Ethiopia Seed Proclamation No. 782/2013 is the main seed legislation for the country.[6] This proclamation regulates the systematic production and control of seed quality and describes field and seed standards for different seed classes. Based on the law, Seed Regulation No. 375/2016 was gazetted and is fully operational.[7] Regulation No. 361/2015, sets fees for variety testing/release/registration and rates for seed quality assurance services.[8] The revised seed proclamation was ratified by the Council of Ministers on 19th August 2022, pending the approval from the House of Representatives. There are also several ministerial directives - certificate of competence, tracking of rejected seed lot, production of unregistered varieties, seed marketing, quality declared seed - which aim to facilitate the smooth functioning of the seed sector. The Plant Breeder's Rights (PBR) Proclamation that was adopted in 2006 was amended in 2017 (No. 1068/2017).[9] However, the regulation that facilitates the implementation of this law awaits final approval.

In early 2022, the Ethiopian government established the Ethiopian Agriculture Authority (Proclamation No. 1263/2021), an agency aiming to address the agricultural regulatory issues including seeds. The Authority was established as an autonomous federal government organ having its own legal entity. The recently approved Regulation No. 509/2022 clearly indicated the roles, duties and responsibilities of the authority. Some of the duties regarding seeds are; conduct of variety testing and registration (Distinctness Uniformity & Stability-DUS & National Performance Trial/Value for Cultivation and Use-NPT/VCU), administered plant breeders rights, plant quarantine, seed quality control and certification especially for import and export.

6 Federal Democratic Republic of Ethiopia. 2013. Seed Proclamation No. 782/2013. Federal Negarit Gazette. Addis Ababa. 15 February 2013.
7 Council of Ministers. 2016. Seed Regulation No.375 of 2016
8 Federal Democratic Republic of Ethiopia. 2015. Regulation No. 361/2015. Federal Negarit Gazette. Addis Ababa. 14 December 2015.
9 Federal Democratic Republic of Ethiopia. 2018. Proclamation No. 1068/2017. Plant Breeder's Rights Proclamation. Federal Negarit Gazette. Addis Ababa. 1 March 2018.

Section 3:

Summary of existing initiatives and investments in the seed sector of the country

There are several ongoing initiatives related to seed sector development in Ethiopia. These initiatives include projects or specific investments and are funded and/or implemented by the public sector, private sector, research institutions, development partners, or non-governmental organizations. The documentation of these initiatives is intended to avoid any duplication when new projects or interventions are planned and to ensure coherence and learning from existing engagements. The interventions listed in Table 2 below may not be exhaustive.

Table 4: Existing initiatives and investments in the seed sector in Ethiopia

Project	Component	Outputs	Duration
1. Institutional Support for Seed Systems in Ethiopia (ISSSE) project: component support to the sustainable supply of Early Generation Seed (EGS)	1. Improve quality of EGS produced by research centers. 2. Improve resource capacity of research centers engaged in early generation seed (EGS) production and EGS production and marketing enhanced by 10% annually NARIs will re-invest 50% to 75% of their revenues on EGS production seed processing, storage, and farm mechanization capabilities will be enhanced. 3. Improve EGS production by actors and narrow the mismatch between demand and supply of EGS by 10%. 4. Accelerate adoption and implementation of policy that permits EIAR to license public varieties and build public research institutions' capacity to license public varieties. 5. Improve knowledge and skills by strengthened seed technology research in the national agricultural research institutes (NARIs).	Total quality management system put in place for breeder and pre-basic seed multiplication by research centers and two seed laboratories at research centers equipped with the minimum internal quality control facilities, capacity, and standard operating procedures required for accreditation.	4 years
2. ISSSE project: component support to Seed quality assurance (QA)	1. Strengthen the plant variety release and protection system.	1.1 An autonomous seed QA Institution with its own testing stations is established at Federal Level.	4 years
	2. Ensure that number and experience of quality assurance (QA) and field office staff are sufficient to meet QA needs at each site and deliver comprehensive training for QA staff.	2.1 Ensure that number and experience of QA and field office staff are sufficient to meet QA needs at each site and deliver comprehensive training for QA staff.	
	3. Upgrade to basic levels of functionality in two regional labs (tier 2) and to ISTA standards in the federal seed quality and phytosanitary lab(s).	3.1 At least one Seed lab accredited according to ISTA Rules. 3.2 Two regional seed labs will be upgraded to the next basic functionality tier level.	

	4. Review current and desired ICT tools and capacity, including viable pathways to implement full and effective usage of ICT solutions.	4.1 Conduct review on Current seed certification linked ICT solution in place. 4.2 Organize a series of training on potential ICT solutions and IT usage. 4.3 Integrating existing GPS-supported field inspection and yield estimation to drone-assisted and remote sensing initiatives of the country.	
	5. Ensure functional, two-way stakeholder dialogue on QA issues.	Launch an annual stakeholder platform on QA issues.	
3. ISSSE project: component support National policy, legal and regulatory framework	1. Accelerate enactment of the New Seed Proclamation and develop implementing regulations.	1.1 At least 3 seed-related legislative documents are drafted, validated, and submitted to MoA. This will include full alignment with the common market for eastern and southern Africa (COMESA) seed regulations. 1.2 Company self-seed certification is fully implemented in three regions and at least 3 companies are issued with competency certificate.	4 years
	2. Develop PVP regulations and establish the relevant institutional framework to implement the PVP regulatory framework.	2.1 PBR regulation is ratified and popularized to at least 25 multi-national and 50 domestics companies.	
	3. Strengthen Sanitary and Phytosanitary (SPS) framework and risk-assessment capacity.	The Ethiopian Plant Quarantine Proclamation No.36/1971 and Plant Quarantine Regulations No.4/1992 are harmonized to COMESA seed rules.	
	4. Build the MoA's and regional regulatory capacity to implement anti-counterfeiting measures.	Illegal seed trade directive is drafted and endorsed. 4.2At least 350 police, legal officers, and Regional Regulatory Inspectors trained.	
4. The Ethiopia-Netherlands Seed Partnership (ENSP)	1. Private sector development.	4.1 Selected domestic and international seed companies expanded their business in Ethiopia. Strong linkage is created between selected value chains and seed business. The Ethiopian Seed Association developed a capacity to deliver its commitment to its members and thus contributed to the seed sector development.	3 years

	2. Skill development and empowerment.	2.1 Capacity of human resources in the seed sector developed. 2.2 Curriculum on Seed Science, MSc program, of 2 Universities revised. 2.3 Fresh graduates acquired practical experience by working as interns in seed sector. 2.4 Farmers acquired knowledge and skill in good agricultural practices for different crops.	
	3. Enabling Seed Business.	3.1 Regulatory framework developed, wherever there is a need. 3.2 Ethiopian Agriculture Authority (EAA) take full responsibility for variety testing activity from the research system. 3.3 Regulatory structure in the country started providing efficient seed quality assurance services. 3.4 Phytosanitary service started providing efficient services.	
4. Supporting Sustainable Agricultural Productivity Programme (2021-2023) (SSAP) SSAP/GIZ	The project objective is to improve conditions for the production of early generation seed to strengthen the seed sector in Ethiopia and thus contribute to an increase in agricultural productivity.	The project's multi-level approach is reflected in the two outputs and indicators. **Output 1:** Enhanced policy and technical dialogue lead to decisions that further strengthen the seed sector and improve and the organizational capacities for the production of early generation seed. 1. A key activity is the establishment of an independent seed authority and specifies the mandate, organigram, budget, human resources and their competency profile for the new body. 2. Recommendations for the transition to market oriented EGS production. 3. Regular publications- policy brief. **Output 2:** Improvement in the technical-technological processes of variety development up to the provision of pre-basic seeds.	4 years

		1. The effectiveness and efficiency of the EIAR barley breeding program to breed and release new barley varieties with proven superior yield or quality performance and provision of high-quality breeder seed to seed producers. 2. Application of Distinctiveness Uniformity and Stability (DUS) and Value for Cultivation and Use (VCU) tests according to international standards. 3. Introduction and application of royalty fees by the relevant authorities according to the Plant Breeders Rights. 4. Increase EIAR EGS production by 20%. 5. Increase private companies' non-hybrid EGS production by 25%.	
5. AGRA's support to strengthening the Ethiopian Seed Association (ESA) for increased participation of the private sector in seed sector development	1. To increase the capacity and professionalism of ESA for increased compliance and advocacy for policies that support the liberalization of the seed industry.	1.1 ESA constitution/by-law reviewed and updated aligning it to the current situation within the seed sector. 1.2 ESA code of ethics and conduct developed to guide members in complying with professional standards in seed business. 1.3 Stakeholders' engagement workshop and one high level technical committee workshop conducted to develop a constitution, and Code of ethics with the participation of ESA members and key stakeholders from different organizations (ATA, EIAR, MoA, ICARDA, GIZ) and disciplines (seed sector, Policy makers).	1 year
	2. To support the development of ESA's business and operational strategies for efficient service delivery to members, effective engagement in seed sector consultations, and sustainable management of the association.	1.1 ESA strategic plan and its operational strategies developed and adopted to support the management and operation of the association as it focuses membership recruitment, public-private sector engagement, attraction investment to the sector 1.2 One stakeholders' engagement workshop and one high-level technical committee workshop.	

Section 4:

Analysis of seed sector challenges and gaps and strategic interventions for investment

Component 1: National Agriculture Research and Breeding Effectiveness (NARS)

The key metric for the success of a breeding program is the rate of genetic gain it delivers in farmers' fields. Investments in public breeding programs can only be justified if there is genetic gain over time, thus the need to embark on system changes that would improve the ability of the research system to generate and deliver products efficiently and timely. The main institutions involved in agricultural research and breeding of the main staple crops are the national Ethiopian Institute of Agricultural Research (EIAR), and Regional Agricultural Research Institutes (RARIs): the Oromia Agricultural Research Institute (OQQI/OARI), the Amhara Regional Agricultural Research Institute (ARARI), the South Agricultural Research Institute (SARI), the Somali Region Pastoral & Agro-Pastoral Research Institute (SoRPARI), the Tigray Agricultural Research Institute (TARI) and local universities.

While public universities employ a few breeders, none of them had active breeding programs for any of the four focus crops.[10] In 2020, there were 122 breeders in Ethiopia. By crop, there were 42 wheat breeders, 31 sorghum breeders, 27 maize breeders, and 22 teff breeders.2 Out of the 122 breeders, 61 breeders worked at EIAR while the rest worked at the RARIs. The number of breeders in 2020 increased significantly from the 74 breeders reported in 2017. The most notable increases were seen among wheat breeders (from 20 to 42 breeders) and sorghum breeders (from 16 to 31 breeders). Among the factors contributing to these increases is the recruitment of staff, partly related to a change of management in the EIAR, which recruited about 100 new staff members in 2018. Further, the IQQO had upgraded some of its research centers from soil laboratories to fully-fledged agricultural research centers. In addition, the country's research institutes introduced new employment incentives in 2014/15, that have helped retain more breeders.

Each breeding team has been productive with releases in each of the four focus crops over the years. Between 2018 and 2020, a total of 43 varieties were released: **7 maize varieties**, **18 wheat varieties**, **9 teff varieties**, and **9 sorghum varieties**; an indication that all four breeding programs are active. The breeding activities of most of the crops had strong partnership with the CGIAR Centers.

The vision of a healthy crop improvement system includes the following:

- Well-articulated and prioritized product profiles that are consistent with producer's needs that are based on market surveys to guide the breeding program;
- A clear varietal pipeline management strategy;
- Research is supported by a team of interdisciplinary scientists focused on the crop product profile;
- Provision of adequate budgetary support from the government or other potential sources;
- A program works in tandem with downstream actors (such as EGS producers, extension services, commercial producers, regulatory bodies, etc.) to assure proper hand-over and post-release support; and,
- A focus on continual improvement (product replacement) and adaptation to the changing needs of farmers and markets.

Key challenges and gaps in National Agricultural Research and Breeding Effectiveness

1. **Crop improvement team.** Collaborations among crop improvement teams are largely ad hoc and there is limited staff capacity to manage a results-driven crop improvement agenda.
2. **Product profiles.** Varieties are released without clear merit over the existing varieties. In some cases, the same variety is released by different names from different research institutes.
3. **Infrastructure.** There are limited facilities to screen for defensive traits; inadequate mechanization, digitization, and data management protocols; and poor seed storage facilities and may result in losses.
4. **Breeding and testing strategy.** The crossing strategy for developing superior varieties is not well-defined. There is an inadequate breeding pipeline such as the number of crosses, population size, and germplasm diversity. The testing effort is of limited size and quality.
5. **Program impact.** Variety turnover at the farm level is low and the age of varieties in common use is older than

10 Mabaya, E., Hassena, M., Waithaka, M., Mugoya, M., Camara, M., Tihanyi, K., Kanyenji, G., Damba, B. 2021. Ethiopia 2021 Country Study - The African Seed Access Index (version April 2022).

desirable. There is a low demand for many of the new released varieties, which may be constrained by poor demand creation.

6. **Limited budget allocation for research.** Research is very much constrained by budget and the government-allocated budget is mainly spent on salaries. The lack of operational budgets causes the available researchers to be inactive.
7. **Private sector participation in breeding is non-existent.** In Ethiopia, there are no private breeding companies to develop varieties as there was no policy that supports them. Breeding is only in the hands of government research institutes. Although late, the current policy allows companies to engage in breeding and introducing, testing and release of foreign private varieties.
8. **No adequate incentive for public breeders to develop varieties that are superior to international companies.** Releasing variety contributes to the promotion of breeders in the research system. But there is not much incentive beyond salary promotion. Implementation of plant breeders' rights law has not started, and this delay reduces the incentives to public breeders in Ethiopia.
9. **Shortage of land for variety maintenance.** The land available for research is shrinking as it is taken by municipalities for other developments.

Strategic interventions for investment

1. **Organize a disciplinary crop improvement team to work on priority issues.** To enhance collaboration among disciplinary scientists to effectively manage results-driven variety development agenda.
2. **Develop product profiles and release varieties with clear farmers'/consumer-preferred traits.** A clear product profile would guide product development and deploy the most efficient and economical processes that enable the timely identification of superior products. Breeding programs should connect breeding pipelines to final commercial products and put in place a system that is more consistent and well-articulated.
3. **Develop research infrastructure.** There is a shortage of greenhouse/field screening, irrigation facilities, labs, low use of mechanization, a lack of conditioned storage facilities, inadequate transport facilities, and ICT-based data management to enhance breeding efforts. The availability of the required infrastructure would contribute to improve the efficiency of the breeding program.
4. **Set crop improvement management strategy.** Priority crops improvement programs should develop/upgrade their breeding approach as part of an improvement program.
5. **Identify representative agro-ecology for testing, develop the testing design, fix the number of locations/repetitions, etc.** The establishment of representative testing sites/stations in the appropriate environments would contribute to efficient and effective breeding, selection, and testing that delivers products with critical traits and local adaptation would require interpreting available data through analysis and delineation of the target population of environments. EAA needs to have its own land in the representative agro-ecological locations for testing of candidate varieties for registration and release.
6. **Develop product profile-based investment plans.** The absence of profile-based investment plans and adequate budgets limit the development of competitive varieties.
7. **Support to establish professional seed companies.** The government needs to support the growth of private seed companies by initiating a project in which interested professionals are involved in starting a seed company. The support may include the provision of land as well as access to finance.

Component 2: Early Generation Seed Production and Distribution (EGS)

In Ethiopia, EGS is produced primarily by three types of producers: research institutes, public seed enterprises, and private seed companies.

Key challenges and gaps in Early Generation Seed Production and Distribution

1. **Inadequate variety maintenance.** Breeders do not pay strict attention to the variety maintenance procedures to ensure the supply of quality EGS. This is partly because breeders are not accountable for variety maintenance.
2. **EGS in the research institute is not business oriented.** As a result, production is supply driven and there is no guarantee that the seed producer will have EGS for seed production. The efficiency of research centers in terms of the production of EGS is very low. In addition, an increasing proportion of the budget is spent on salaries rather than operations.
3. **Limited enforcement of contracts.** A lack of contract enforcement (between suppliers and buyers) affects market development for EGS. In addition, the lack of accountability affects the quantity and quality of EGS produced in the research institutes as well as parastatal seed enterprises.
4. **Promote semi-commercialization EGS seed production.** This needs special permission from the government, mainly from Ministry of Finance (MoF), to allow flexible financial operations to enable public research institutes to reinvest own generated money.
5. **Design a mechanism for the role of the government in contract based EGS production.** It proposes that the role of the government gradually decreases to mainly focus on facilitation and providing a working environment. However, there have been limited initiatives from producers and suppliers. The two parties (suppliers and buyers) need to develop their own contract arrangements with close support from the MoA.
6. **Limited production capacity of research centers.** Infrastructure for seed production limits the quality of seed produced in many research centers. In particular, the diminishing of size of farm holdings for research centers

intended for EGS production has contributed to limited seed production by those centers.

7. **Poor allocation of foreign currency:** Although few multinationals play significant roles in the production and marketing of seed (hybrid corn and horticultural crops), the issue of foreign currency allocation to import parental seed remains a major challenge.

Strategic interventions for investment

1. **Address breeder seed quality concerns.** Breeders' failure to follow variety maintenance protocols and established accountability mechanisms result in the production of poor-quality seed.
2. **Operationalize licensing of public varieties to ensure EGS production and supply.** Enforcement of competition in access to EGS is not open to all seed producers.
3. **Invest in physical facilities for EGS production.** There is a general lack of storage, processing, irrigation, mechanization, and treatment capabilities.
4. **Enforce the EGS production contract.** EGS is often sold without a contract from public research institutes.
5. **Establish business seed units within research institutes for EGS production.** This will require a review of existing financial regulations and approval from the MoF.
6. **Attempt to allocate reasonable foreign currency for the import of parental lines.**

Component 3: Commercial Seed Production and Marketing (CPM)

In Ethiopia, commercial certified seed is produced by three types of producers: public seed enterprises, private seed companies, and Farmer Cooperative Unions (FCUs)

Key challenges and gaps in Commercial Production and Marketing

1. **Low capacity of domestic seed producers.** The capacity of seed producers (private, cooperative/union) in Ethiopia is very limited. Most of them produce less than 500 MT of seed per year due to the limited resources (land, physical facilities, and finance). They contribute less than 1/4 of the total seed supply volume. The private sector focuses almost exclusively on hybrid maize, and to some extent bread wheat.
2. **Lack of professional seed business management.** The seed company owners are weak in maintaining the professional requirements submitted to acquire Certificate Of Competency (COC). After getting the COC, they are known to fire the professional hired to acquire the COC. This is due to a lack of professional knowledge about seed business management.
3. **Limited government support for the promotion of the private sector.** While the seed policy is clear that the government supports private-sector development, in practice this is not the case. In Ethiopia, public seed enterprises receive preferential treatment from the government.
4. **The mismatch between supply and demand of EGS:** The government has been working to ensure contract based EGS supply to narrow the gap with demanded amounts. In a few crops it was possible to fill the gap. but there are still major challenges in meeting demand due to insufficient land for multiplication of EGS and reservation by the contracting parties to abide by contractual agreements, and entering into either administrative or legal enforcement. As a result, regional governments have been forced to enter into allocation options to ensure that seed companies are well addressed in accessing EGS. However, in scarce EGS supply seasons, regional governments prefer to trust and prioritize their regional companies over the private seed firms.
5. **Limited crop and variety portfolio in commercial seed production.** The current supply of seed in Ethiopia is dominated by two crops (wheat and maize), contributing about 85% of the total supply. This is against the diversified crop production in the country.
6. **Low seed recovery from out-growers.** The low seed recovery from out-growers is related to weak contract management. This is due to the fragmented nature with many smallholder farmers engaging in the seed production system of the country, thus making enforcement complicated. In addition, seed producers do not enjoy any flexibility in setting prices, resulting in defaults by out-growers. This is complicated by competition from the grain market where seed is diverted to when grain prices are high.
7. **Practically, seed marketing is not fully liberalized in Ethiopia.** It is clear that the seed marketing directive urges the placement of free marketing system in place. This is applicable in the good years where the amount of production is dependable to exercise free markets. But the same directive also allows allocation approach in times of seed supply constraints across species and varieties. As a result, seed unions, public, and private seed companies are restricted to selling their seed only in the locations that the regional bureau of agriculture assigns them. This works mostly for seed companies and unions that use only public owned varieties with a sense of seed supply allocation approaches. This discourages the development of marketing practices and capacity.
8. **Stringent criteria set to obtain business license for foreign companies.** The stringent criteria is related to the interpretation of theEthiopian Investment Commission's (EIC) legal frameworks, although the legal frameworks do not prohibit the engagement of foreign and domestic firms as seed companies without having land for seed production. Since the claims of EIC are related to contract farm-based seed production, company models are still unsupported supported by law.
9. **Weak commitment of private sector in extension service.** Although the government set a provision that forced seed companies that use public owned varieties to engage in variety popularization, with the exception of the public & union seed farms, private seed companies are reluctant to run extension services as a social duty to

their customers.

Strategic interventions for investment

1. **Strengthen the infrastructural capacity of domestic seed companies.** The capacity of domestic seed producers to produce seed and marketing services through multiple channels like shops should be improved through enhanced infrastructure development including land.
2. **Support joint-venture seed business.** Encourage joint venture partnerships between companies to bring the newest genetics and innovative technology to expand seed line-ups, accelerate innovation, develop products, and share know-how through a common technological platform. Joint ventures with international companies would enhance the technical and financial capacities of local companies.
3. **Make the public seed companies more efficient.** Public seed enterprises could be made more efficient by selling part of their shares to the private sector and ensuring their management is led by professionals.
4. **Professionalize seed business.** New entrants need to be screened for professionalism and financial capacity to produce seed. Existing companies should be supported with training in seed business management. Organize and support Ethiopian agricultural professionals to establish and run seed companies. Also, organize support unemployed fresh agriculture graduates to engage in the seed business, including agro-dealership.
5. **Change perceptions about the private sector.** Government structure at all levels should understand the importance of the private sector in the seed sector and provide the necessary support. Moreover, it is important to improve the ESA policy advocacy capacity from the government side, and influencing its members to abide by seed-related legislations and the country's quality standards, including developing social accountability to support the smallholder farmers to access varieties through popularization.
6. **Develop a business-oriented basic seed supply system.** The Direct Seed Marketing (DSM) should be scaled up according to the provisions indicated on the MoA seed marketing directive. This ensures a direct linkage between producers and buyers without the involvement of the Regional BoA/MoA, except in bad production seasons.
7. **Special incentive for seed production of less profitable crops.** Major crop portfolios of public seed enterprises and cooperatives/unions should venture into the production of crops other than wheat and maize. This can be attained by designing a special incentive package for pulse crops, oil crops and grain crops seed supply with a smaller profit margin and being less attractive to seed firms.
8. **Strengthen the out-grower management system.** The contract should be realistic, and parties should abide by it. The price needs to be flexible to accommodate the changing production costs. This will be met by enhancing contractual certified seed production capacity through strengthening the out-grower schemes.
9. **Seed marketing must be left to the seed companies.** Seed companies should develop their marketing network through sales agents and agro-dealer programs as indicated in the seed marketing directive. They must also have the freedom of operationalizing the networks, including pricing.
10. MoA, local governments and the investment office must to work together and understand the contribution of private sector.
11. Facilitate and engage the drive and energy of private companies to inform farmers and educate on the advantages of their improved seed and other related technologies.

Component 4: National Policy, Legal and Regulatory Framework (PLR)

The policy, legal and regulatory (PLR) framework provides a lens through which to assess a country's seed system; identify relevant regulatory good practices and models that have worked in other markets; integrate legal and political economy considerations that could work as an incentive (or disincentive) for change and identify which interventions could be prioritized. A well-developed policy and regulatory environment are central to a functioning seed system that ensures farmers' access to affordable, available, and appropriate quality seed. Each of the key elements of the seed system notably; (i) breeding and variety release; (ii) early generation seed supply; (iii) certified seed production; (iv) awareness by farmers; and (v) seed marketing and distribution is affected by and requires adequacy of the policy and regulatory environment at national, regional and international levels.

Key challenges and gaps in PLR in Ethiopia

1. **Weak private sector participation and capacity to influence policy and regulatory measures.** The weak participation of the private sector is highly associated with the recent opening of the sector to private actors, the weak presence of incentives, the presence of some policy provisions like land ownership requirement prior to getting a business license, and high business entry requirements for small-and-medium sized companies (land). In addition, there is mistrust in the public sector. On the other hand, certain private actors engaged in the seed sector lack the required commitment along with professionalism. The seed association established to ensure adequate policy advocacy is still very weak with the limited constituency.
2. **Insufficient funding for public national and regional research institutions and regulatory authorities.** Under Ethiopia's Science and Technology Policy of 1993 (revised in 2007), the government committed to spending 1.5 percent of the country's GDP on R&D. This, however, has never been realized. Government funding for public research has significantly decreased, falling from 0.61 percent in 2013 to 0.23 percent in 2017. Stakeholders noted that funding for public research institutions continues to be limited, even where supplementary financial support is provided by donors through grants. Limited funds have affected the timely production of quality EGS, the development of superior varieties, and the capacity for personnel. Similarly, national and regional regulatory

authorities require considerable allocation of resources to effectively play their expected role (testing sites, infrastructure, and human capacity).

3. **Weak enforcement of EGS contracts.** EGS distribution is regulated under the Public Crop and Forage EGS Administration directive, No. 458/2013. Research institutions enter into legal contracts with private sector actors, including seed companies, public seed enterprises, and seed cooperative unions, to supply them with EGS, and a demand assessment is made prior to EGS production. These contracts are binding, but there is a limited exercise of enforcement by both parties. This has resulted in a mismatch between demand and supply for EGS by either crop or variety.
4. **Implementation of PBR proclamation No. 1068/2017 is pending.** Unfortunately, the legal framework for the protection of varieties and PBR is still in the process of ratification. The PBR Proclamation was enacted in 2006 and amended in 2017, but no regulations have been passed to provide procedural guidance on the enforcement of the law. This contributed to the delay of the endorsement of the final draft Directive for Public Variety Licensing. Moreover, the institutional framework for PBR is incomplete. The absence of a complete legal framework on PBR discourages investment in the seed sector by international seed companies that are planning to expand their operations in Ethiopia.
5. **Insufficient institutional capacity and resources to conduct DUS and NPT/VCU tests for variety registration and release.** According to the 2013 Seed Proclamation, the independent body (now EAA) is responsible for conducting DUS testing and NPTs prior to the registration and release of the varieties. However, at present, variety testing is carried out by research institutions and universities subject to an application process. If private companies apply for variety registration, the EIAR or universities will conduct the adaptation trials. However, stakeholders have noted a likely conflict of interest since the same research institutions that conduct the evaluation testing are ultimately in competition with the private sector. Stakeholders also noted that the fees charged by the research institutions do not follow the fees stated in the regulation (Regulation No 361/2015), making the process more expensive and at odds with legal measures. This prevents companies from registering varieties that may be of great public interest, yet are not as commercially viable. Companies have also expressed frustration with the management of the evaluation tests by the research institutions, saying that they lack the required capacity to effectively assess certain characteristics (for example, several varieties have previously failed to exhibit clear VCU traits). In addition, the government lacks sufficient funding to cover the costs of the national variety release committee (NVRC) to evaluate NPT data and evaluate the variety verification trial (VVT) and convene the NVRC. The MoA brings in experts from different organizations to form the NVRC and commodity-based technical committee (TC) for variety evaluation on an almost voluntary basis, but what the Ministry can afford to pay in terms of per diem and travel costs, is insufficient, which discourages participation. The MoA is also short of funds to convene the NVRC on time. For instance, in 2019, the NVRC only met once instead of the officially scheduled two meetings per year. In addition, EAA does not have testing sites in which the varieties are planted and evaluated.
6. **Outdated legal framework on trade and SPS.** Importers and exporters must comply with Ethiopia's SPS measures, that are provided for under the Plant Quarantine Proclamation No.36/1971 and Plant Quarantine Regulations No.4/1992. However, the two regulatory instruments do not address non-compliance notifications or define terms like phytosanitary measures, quarantine, and point of entry, contrary to the COMESA Seed Trade Harmonization Regulations.[11] The national quarantine pest lists are also not updated or published, which is out of alignment with the COMESA regional rules. Ethiopia could address these gaps under the plant quarantine proclamation and regulations, that are currently under revision.
7. **Limited cross-border trade in seed.** The COMESA Seed Trade Harmonization Regulations are binding on the Member States, but still, require domestication at the national level to be effected. While Ethiopia is taking steps to align the national PLR system with the COMESA Seed Trade Harmonization Regulations through the 2022 Draft Seed Proclamation (approved by the Council of Ministers and waiting ratification from House of Representatives), Ethiopia's current seed system follows the 2013 Seed Proclamation, which is not aligned with COMESA rules. However, the 2022 Draft Seed Proclamation addresses all gaps.

Strategic interventions for investment

1. **Strengthen private sector participation and capacity to influence policy and regulatory measures.** This includes strengthening ESA bargaining power, private sector integrity through the implementation of ESA code of conduct.
2. **Enhance funding for public institutions, including both national and regional research and regulatory authority.** This could be achieved through the implementation of variety licensing, a special incentive through the utilization of royalty fees, semi-commercialization of public research institutions and utilization of internally generated revenue. Regarding enhancing the self-financing of regulatory institutions, this could be achieved by improving regulatory service fee regulation and ensuring internal utilization of generated revenue.
3. **Enforcement of EGS contracts.** Through enhanced operational capacity of research centers for EGS supply, support EGS production operations within the research system, and scale up the decentralization of EGS production to new geographies and operationalize variety licensing for better commercialization of new varieties.
4. **Finalize and implement directives on public variety licensing.** Through the socialization of the directive, and training of implementers.
5. **Build institutional capacity of the Ethiopian Agriculture Authority (EAA).** Through the establishment of new testing laboratories, improving seed certification capacities infrastructurally, through logistics, HR and facilities. EAA also requires regional regulatory capacity enhancement for the institutions that take regulatory rules to the

11 COMESA. 2014. COMESA Seed Trade Harmonization Regulations, 2014.

grass root level.

6. **Strengthen the technical and National Variety Release Committee (NVRC).** By revising the existing variety release guidelines, support Variety Evaluation Committee to make it more efficient and inclusive (gender, private sector).
7. **Improve other activities related to the regulatory system.** Through updated legal framework on trade and SPS, support International Seed Testing Association (ISTA) membership and accreditation of the national lab, promote cross-border trade in seed, promote enforcement of anticounterfeiting measures, support to finalize the PBR regulation and design a strategy for implementation, revise and implement the existing variety registration guidelines and capacity building for variety examiners (field management, variety administration, data management, and data analysis).

Component 5: National Seed Quality Assurance (QA)

National governments want to ensure that farmers receive high-quality seed from the formal sector, yet often do not: 1) have proper quality assurance regulations in place, and/or, 2) implement or assure implementation of their existing quality assurance regulations well, resulting in low-quality seed for farmers. A healthy seed system is one in which farmers have confidence that the certified seed meets labeled quality standards, and actively patronize the brands with the highest quality seed of the varieties they want to plant; and one in which seed companies work to exceed quality standards and view the regulator as their partner in this quest.

Key gaps and challenges in quality assurance

1. **Lack of full compliance for EGS quality assurance.** Although there is a provision in the seed regulation and proclamation to enforce EGS quality assurance, there is a limitation of implementation as per the regulation across the EGS producers.
2. **Delay in the operationalization of digitalized quality assurance functions.** The accuracy, efficiency, and transparency of QA are all strengthened by the appropriate and sustainable use of ICT tools. The MoA works with donors on the adoption of ICT tools, such as GPS for field inspection activities and an e-certification system. However, the successful employment of ICT tools for national QA needs to be carefully sequenced with overall QA system maturity and capacity, in addition to being rigorously vetted to ensure that it can work in a country's ICT environment.
3. **Lack of effective two-way dialogue between the regulatory authorities and seed stakeholders.** Farmer representatives surveyed indicated dissatisfaction with the communication channels available for reporting problems with the quality of certified seed. The seed producers surveyed were more positive about channels of communication, however, communication is highly unlikely to be accurate, given deficiencies in inspection and laboratory testing practices. Some producers report receiving testing results late, linked to limitation of seed processing capacity, which leads to marketing delays but generally cited QA resource constraints as the cause for late delivery of results.
4. **Inadequate finance resourcing for QA activities.** Funding constraints are apparent by the low level of field inspectors and vehicles to support the high hectarage of field that needs coverage, as well as the low capacity of inspectors. Inspections are not timely and sampling levels are below the expected volume compared to the need for the total volume of certified seed produced. Labs still need more and better facilities, equipment as well as technicians' capacity strengthening. Fees charged for sub-optimal QA service are extremely low, which limits the government's ability to reinvest in improvement.
5. **Absence of seed laboratory at the national level that is accredited by the International Seed Testing Association (ISTA).** Under the 2016 Seed Regulations, Ethiopia's certification process must be in alignment with ISTA requirements. Ethiopia does not yet have an ISTA-accredited laboratory, which affects regional and international acceptance of locally produced seed for export because all seed for export is required to be accompanied by an ISTA Orange Certificate.
6. **Ineffective implementation of anti-counterfeiting measures.** Under Article 26 of the 2013 Seed Proclamation, the sale of counterfeit, substandard, or fake seed is an offense punishable by imprisonment of 5–10 years and a fine ranging from Birr 50,000 to Birr 100,000. However, neither the 2013 Seed Proclamation nor the subsidiary regulations describe the process through which anti-counterfeiting measures can be implemented, including if and how to lodge a complaint. Stakeholders noted that the stated anti-counterfeiting measures were partially implemented.

Strategic interventions for investment

1. Ensure that the number and experience of QA and field office staff is sufficient to meet QA needs at each site and deliver comprehensive training for QA staff that will be available when needed. This requires training to cover all functional areas of QA. Staff assignment planning should also include planning for career paths, continued education, rotational assignments, and preparation for future responsibilities, such as auditing third-party inspectors and coordinating the development and oversight of e-certification.
2. Develop and implement a plan to deliver QA for EGS that is aligned with best practices for QA, and to support improvement among QA producers not meeting standards. This will require an expert team to develop a plan to put in place process improvements for the entire range of QA for EGS. Once overall process improvements are identified, the team conducting the plan will need to identify the sites upon which they want to focus for the proposed implementation.

3. Ensure functional, two-way stakeholder dialogue on QA issues. Feedback from seed producers will enhance service delivery and reduce bottlenecks in the production of quality seed. This entails ensuring that regular public-private meetings are held, with joint agenda setting, including QA issues, and sufficient advance notice, joint agreement on optimal meeting times, and openness to participation by all relevant stakeholders.
4. Develop and implement sustainable funding plans (both operating and capital expenditure) for QA activities. This will entail establishing clear payment flows for government-provided seed services back to the agency providing services to generate investment revenue; exploring the feasibility of significantly increasing fees charged to QA service users, parallel to increased delivery of strong QA value through improved services establishing a budget for covering a portion of operating expenses not covered by service fees, or requiring bridge funding while fees are collected; and developing capital expense investment budget to cover the acquisition of assets for labs and QA activities such as vehicles, building repairs, equipment, etc.
5. Review current and desired IT tools and capacity, including viable pathways to implement full and effective usage of ICT solutions. The recommendation is to contract technical expertise to work with the ministry to address the issues highlighted above, covering both international, national, and regional ICT capacity and effective use of tools such as e-certification and GPS field inspection support as potentially important support tools for QA in Ethiopia.

Component 6: National Planning and Coordination (NPC)

Under the Malabo Declaration of 2014, the African Union's Comprehensive Africa Agricultural Development Program (CAADP) is the policy framework for agricultural transformation, wealth creation, food and nutrition security, and economic growth. African nations committed to making public investments equal to 10 percent of Agriculture GDP to achieve agricultural transformation with an eight percent (8%) annual sector growth rate. Translation of these political commitments into policy, policy into strategy, and strategy into seed plans and operations is expected to lead to clear identification of roles and responsibilities and improvement in public, private, and development partner annual planning and coordination. The vision of a healthy system is one in which there is better planning and coordination that support continuous improvement of the supply of quality seed of crop varieties that improve productivity and respond to the demand of both farmers and end users of crops.

The assessment of the national planning and coordination is based on four themes: i) the clarity of the national seed strategy; ii) the strength of the public-private joint effort for seed sector planning; iii) the strength of the public-private joint effort for seed sector coordination; and, if applicable, iv) the effectiveness and efficiency of subsidies.

Key gaps and challenges in National Planning and Coordination in Ethiopia

1. **Lack of a unified government-led coordination mechanism.** Coordination responsibility is split among MoA & RBoA: Input marketing chief executive implementor (CEI) for the marketing part, the crop development CEI for seed production, EIAR & RARIs for EGS, EAA & Regional Regulatory Authorities for seed regulatory services. The lack of an apex coordination body is consistently referenced by those surveyed as an issue that affects the ability of the MoA to attract and retain industry-seasoned leadership. As a result, these weak legacy coordination mechanisms, which are split between federal institutions have created unfair allocation of EGS among public and private enterprises.
2. **Lack of strong annual and consistent demand and supply data across years by crop and variety breakdown.** Current demand information is based on prior season, year of production and seed carryover data, annual crop production surveys, and sample surveys. Reporting mechanisms are good for EGS and certified seed volumes are given public enterprise dominance of the seed system, but these are not widely or adequately shared, including private seed firms. Potential demand at the crop level follows standard ordering forecasting for major production zones. Demand estimates for public seed enterprises and cooperatives are generally timely. There is good availability of longitudinal data for the major cereal and pulse crops that have been used over the past decade to reduce carry over seed stocks. There is no good online system to identify stocks that seed companies and dealers could use to make up gaps in production by accessing surplus production from other regions.
3. **Unreliable EGS supply.** The unreliability of public varieties EGS allocations to seed companies operates as a barrier to market development and growth. EGS production has declined or been inconsistent for the four focus crops assessed over the 2017–2019 period, despite development partner investments in some programs. This is because of a lack of strong demand projection and inability to be consistent in submitting contracts well ahead of the production season as indicated on the public verities' administration directive. In addition to this and specific cases, uncertainty about EGS allocations also increases the performance risks of the Southern Seed Enterprise in the SNNPR region, which has no land and is dependent on EGS supplied by other regions to produce certified seed using out growers.
4. **Lack of understanding of seed business model by financial institutions.** This has created poor credit access by public, private, and cooperative model seed companies alike. As a result, there are knock-on effects in terms of finance, where lenders provide funding to parastatals and regional governments (with strong support and guarantee of governments) but are reluctant to provide working capital to private firms as there is no adequate asset collateral.
5. **Seed prices set by the public company's coordination platform are too low.** Currently, seed prices are estab-

lished in consultation with parastatal enterprises, with review and sanctioning of their final levels by the Minister of Agriculture. Exceptions at the certified seed level are private hybrid maize seed companies such as Corteva that have their own seed distribution markets. EGS of public research institutes is determined based on the price of certified seed. For instance, the price of basic seed is higher by 10%, pre-basic by 20%, and breeder seed by 30% over certified seed price. Moreover, except for hybrid maize varieties, there is no differentiation of price between varieties of a given crop. This system is not competitive and affects the volume, quality, and timeliness of EGS produced and distributed. While the public sector seeks to keep seed prices low, there is impact on the quality of seed produced and delivered to farmers.

6. **Weak ESA operationally and financially.** The ESA is functioning, but is a fragile, largely development partner-funded organization. It has a functioning website with clear access to its mission and objectives. It is successful in terms of seed producer membership with more than 80% of private and parastatal seed producers participating. Members have been satisfied with ESA's policy advocacy and capacity-building services delivered through projects, but this level of satisfaction is not reflected by the number of seed companies paying dues, with only about 25% of members currently paying dues. ESA lacks the staff, funding, or capacity to provide key requested value-added benefits, such as regional representation for advocacy, capacity building of emerging seed companies, or development of seed quality programs.

Strategic interventions for investment

1. **Establish a unified government-led coordination mechanism.** At the moment, the MoA and the Regional BoA are theoretically responsible for guiding the seed sector at their respective levels. Within the Ministry, the activities of the seed sector are under two state ministers and three directorates. Similarly, in the regions, different directorates and offices deal with seed issues. These departments focus on their routine activity and the issue of seed sector leadership, if it exists, remains the responsibility of the minister and bureau head, which was delegated to departments. There is a strong need to strengthen coordination and leadership if the seed sector of Ethiopia is to be profoundly transformed.
2. **Strengthen annual and consistent demand and supply data across years by crop and variety breakdown.** This needs to operationalize the existing regulatory and marketing electronic platforms and align them for a common vision by working jointly. This also needs to develop a directive that enforce seed firms to upload updated seed data on a recurrent basis. Moreover, it is better to have a common platform that allows to bring the EIAR, RARIs, and regulatory authorities to reach annual consensus on seed data of the country across seed classes.
3. **Establish a reliable EGS supply.** Ensure public seed enterprises, that produce pre-basic and basic seed are provided with technical backstopping, land, infrastructure, logistics, and operational budget resources. There is a need to identify, pilot, and scale up different business models for pre-basic and basic seed production such as public-private partnerships and licensing of varieties as well as private investment.
4. **Enhance understanding of seed business models by financial institutions.** There is a need to enhance financial institutions' awareness about the seed business. It is suggested that recurrent training should be given on seed sector management and profitability to ensure credit access is based on sound knowledge and financial needs of the sector.
5. **Enforce market-oriented system.** Support and incentivize the private local seed companies to invest in seed business. Public seed companies dominate the seed market in self-pollinated crops whereas the private seed companies are active in high value crops like hybrid maize & vegetable seed which have a dominant share in value. Supporting the private sector reduces the risk resulting from depending on a few by diversifying the production in terms of number of crops and geographical coverage and crop-variety portfolio. As a result, farmers will have better access to quality seed. It also helps the public seed enterprises to specialize in certain crops rather than stretching themselves to produce all crops.
6. **Strengthening ESA operationally and financially.** The EAA is the umbrella organization for seed producers. Its membership includes government parastatals, private seed producers, multi-national seed companies, seed cooperative unions, and seed importers. The association partners with other institutions in matters related to seed sector development. However, the association is weak in its managerial capacity, resource mobilization and advocacy activities.

Section 5:

Strategic interventions, specific actions, and targets

This section presented the strategic interventions by components. Each intervention is broken down into specific actions that will need to be undertaken, expected targets, and dates.

Table 5: *Component 1 – Strategic interventions for National Agricultural Research and Breeding Effectiveness in Ethiopia*

Strategic intervention	Specific action	Proposed target result(s)	Proposed target year of achievement of result@
1. Organize disciplinary crop improvement teams to work on priority issues	Introduce multi-disciplinary crop improvement teams for selected priority commodities within and across research centers – that encompass both regional and federal research institutes.	• Functional and efficient multi-disciplinary teams established from different research centers across the country • Enhanced synergy (regional vs federal) and duplication of efforts minimized	2025
2. Develop market-based product profiles and release varieties with clear merits	Identification of desired traits of the end users for priority crops and design breeding strategy.	• Desired traits are known for priority crops • Trait-based breeding strategy document prepared	2024-25
3. Develop research infrastructure	• Prioritize and develop an investment plan for infrastructure development • Mobilize resources and invest in research infrastructure	• Research infrastructure investment plan developed • Necessary infrastructure bought and installed	2023 2026
4. Set crop improvement management strategy	Priority crops improvement programs should develop/ upgrade their breeding approach as part of an improvement program.	Crop improvement management strategy developed for priority crops.	2024
5. Identify representative agro-ecology for testing	Each crop improvement program needs to identify, testing sites for better variety development.	Representative testing sites identified.	2024
6. Develop product profile-based investment plan for priority crops and provide an adequate budget for the release of competitive varieties	Develop 5-year investment plan for priority crops .	The research budget is known for each of the priority crops.	2024
7. Provide incentives for professionals to establish breeding companies	• Provide start-up capital and land for national agricultural professionals to start seed companies. • Ensure enabling policy instruments are in place.	Ethiopian agricultural professionals start a private seed company.	2025

Table 6: *Component 2 - Strategic interventions for Early Generation Seed Production and Distribution in Ethiopia*

Strategic intervention	Specific action	Target result(s)	Target year of achievement of result@
1. Address breeder seed quality concerns	• Develop variety maintenance protocol for crops • Ensure strict implementation of protocols	Supply of best quality breeder seed.	2024
2. License public varieties to ensure EGS production and supply	Operationalize licensing public varieties.	Seed companies licensed for exclusive user right of public varieties.	2024
3. Invest in physical facilities for EGS production	• Identify EGS producers' infrastructural gaps and develop an investment plan • Invest in infrastructure for EGS production	Infrastructures for EGS producers fulfilled.	2026
4. Enforce the EGS production contract	Establish business-business relations and implement within the contractual obligation.	Smooth implementation of contractual agreement.	2025
5. Establish business seed units within research institutes for EGS production	• Develop an operational legal framework for the business units • Establish the business units	Seed business units established in the research institutes.	2024

Table 7: *Component 3 – Strategic interventions for Commercial Seed Production and Marketing in Ethiopia*

Strategic intervention	Specific action	Target result(s)	Target year of achievement of result
1. Strengthen the infrastructural capacity of domestic seed companies	Access to finance to develop their infrastructure including credit guarantee.	Well-equipped and functional private sector in place.	2027
2. Promote joint ventures	Encourage international companies to invest through joint ventures with domestic seed companies.	Joint venture seed business companies established.	2025
3. Make the public seed companies more efficient	Sale part of the share of public seed enterprise to create efficient seed companies.	Public seed enterprises become share companies by selling part of the share.	2024
4. Professionalize seed business	Reconsider licensing of seed business to ensure professionalism for the new and provide seed business management including coaching.	Professional-based seed business operational in Ethiopia.	2025
5. Registration of seed growers	Register and certify seed growers to ensure seed quality. For small farmers, this can also be made in group.	All seed growers are registered and certified.	
6. Change perception about the private sector	Create awareness and change perception of government structure through conducting private sector-focused seed forums to change the policy narrative.	Good understanding of the role of the private sector created.	2025

7. Develop business oriented basic seed units	Promote business-to-business (B2B) linkage between basic seed producers and certified seed producer companies.	No basic seed allocation through the government.	2025
8. Establish special incentive for seed production of less profitable crops	Develop incentive mechanisms to promote seed production of less profitable crops.	Less profitable crop seed account for at least 30% of the annual seed supply.	2027
9. Strengthen the out-grower management system	Ensure private seed sector manages its out-grower system.	No government intervention in the out-grower arrangement.	2024
10. Leave seed marketing to the seed companies	Implement seed marketing directive.	Seed marketing directive implemented; no seed allocation.	2024

Table 8: *Component 4 – Strategic interventions for Policy, Legal Regulatory in Ethiopia*

Strategic intervention	Specific action	Target result(s)	Target year of achievement of result
1. Strengthen private sector participation and capacity to influence policy and regulatory measures	• Design incentive mechanism for enhanced private sector participation • Revise the seed business licensing requirements to ease business entry • Awareness creation for policymakers for enhanced trust in the private sector (experience sharing, study tour) • Enforce code of conduct compliance and ethics guidelines among private seed actors as a key indicator of building trust • Establish a strong monitoring system to ensure compliance of private actors to adhere to competency requirements (professionalism) and take strong measures for non-compliance	Enhanced participation of private actors in the seed sector.	2024
2. Enhance funding for public institutions, including both national and regional research and regulatory authority	• Accelerate adoption and implementation of policy that permits the EIAR to license public varieties and build public research institutions' capacity to license public varieties: • Increase funding commitments for R&D to at least meet the committed 1.5 percent of the GDP called for under the Science and Technology Policy • Enable regulatory authorities to become independent through self-financing by collecting the adequate service fee	Funding for public research institutions enhanced.	2026
		Funding for EAA enhanced.	

3. Enforcement of EGS contracts	• Strengthening a common and regular platform for EGS production planning. • Establish financially autonomous seed units within research institutes for EGS production as a business entity (semi-commercialization of EGS)	• A common platform for planning EGS production established • Autonomous seed units established in research institutes	2024
4. Develop directives to implement public variety licensing	• Operationalize the public variety licensing (awareness creation, agreement templates, piloting, and scaling)	Directives for licensing of public varieties operationalized.	2023
5. Harmonize of national PVP frameworks with Union for the Protection of New Varieties of Plants (UPOV) provisions	• Conduct policy dialogues for improved alignment of provisions between the international frameworks (UPOV) and the national legal framework including plant variety protection (PVP). • Enhance the implementation of the national provisions (PBR proc No. 1068/2017)	• National and international frameworks on PVP aligned • Proclamation on PBR implemented	2026
6. Build institutional capacity and resources to conduct DUS and NPT/VCU testing for the execution of PBR and Variety Registration	• Strengthen the Ethiopian Agriculture Authority (EAA) to implement the PVP/PBR regulatory framework • Establish a PBR execution office with required personnel and testing facilities	• EAA implements PVP/PBRs • PBR office, staff, and facilities established	2026
7. Strengthen the technical and National Variety Release Committee (NVRC) meetings	• Ensure mobilization of sufficient funding to cover the costs of the NVRC to evaluate National Performance Trials (NPTs) data and to convene the NVRC and technical committees	NVRC funded adequately.	2024
8. Update legal framework on trade and SPS	Design SPS framework and strengthen risk assessment capacity and competency.	SPS framework and risk assessment strengthened.	2024
9. Support ISTA membership and accreditation of the national lab	Facilitate ISTA-accreditation of one national laboratory.		2026

Table 9: *Component 5 – Strategic interventions for Quality Assurance in Ethiopia*

Strategic intervention	Specific action	Target result(s)	Target year of achievement of result
1. Ensure full compliance for Quality Assurance for EGS	Revise and update the existing Certificate of Competence (COC) directive for seed businesses to develop differentiated COC for EGS classes.	All EGS producers issued with COC.	2023

2. Enhance the operationalization of digitalized Quality Assurance functions	• Review current and desired IT tools and capacity, including viable pathways to implement full and effective usage of ICT solutions • Develop a directive for enforcement of the utilization of the online certification system • Design an electronic tagging-based certification system • Ensure alignment of the seed certification and tracking digital system with the seed marketing digital dashboard • Ensure human resources required for capacity building (training and awareness creation across the seed value chain) • Equip relevant stakeholders with relevant ICT equipment	Operationalized ICT-based seed certification.	2024
3. Ensure effective two-way dialogue between the regulatory authorities and seed stakeholders	• Conduct recurrent customer satisfaction surveys both by companies and external consultants • Organize regular public-private meetings with joint agenda setting • Set mobile text and ICT-based feedback system	Effective two-way dialogue between the regulatory authorities and seed stakeholders established.	2026
4. Inadequate funding for QA activities	• Develop and implement sustainable funding plans (both operating and capital expenditure) for QA activities • Conduct annual federal and regional states regulatory dialogue to set standard finance allocation for the regulatory authorities and ensure self-utilization of collected service fees • Revise and update the certification service fee regulation • Operationalize company self-certification and 3rd party seed certification	Funding for QA activities enhanced.	2026
5. Inadequate technical, infrastructure, and logistics capacity for QA activities	• Build the technical capacity of regulators through short- and long-term training • Conduct expansion on the existing laboratory infrastructures • Construct new seed labs across regions based on demand • Fulfill logistics gaps (vehicles and testing facilities) of regulatory authorities • Stocktaking of all equipment to ensure fair allocation of testing facilities and ensure their operationalization • Fulfill new seed quality testing standards and update the existing ones	Technical, infrastructure, and logistics capacity for QA activities enhanced	2026

Table 10: *Component 6 - Strategy for National Planning and Coordination in Ethiopia*

Strategic intervention	Specific action	Target result(s)	Target year of achievement of result
1. Establish a unified government-led coordination mechanism	• Develop directive for the establishment of a national seed advisory and coordination platform • Establish a national and regional seed advisory and coordination body • Conduct annual national seed forums engaging all actors with emphasis on National joint planning and execution	A national advisory and coordination platform established.	2024
2. Strengthen annual and consistent demand and supply data across years by crop and variety breakdown	Operationalize ICT-based supply demand inventory for the current plus two years.	Annual demand and supply data availed.	2024
3. Establish a reliable EGS supply system	Enforce contract based EGS production planning.	A reliable EGS supply contract system established.	2024
4. Enhance understanding of seed business model by financial institutions	Conduct intensive awareness creation and understanding of the seed business model for Financial Institutions.	Understanding of seed business models by financial institutions enhanced.	2026
5. Enforce liberal system	Enforce and execute price setting system as indicated on the seed marketing directive.	Liberal price-setting system enforced.	2026
6. Strengthening ESA operationally and financially	• Design a comprehensive strategy for a policy advocacy program • Maintain strong membership plan and financial resource management to ensure key membership issues are addressed through a sound association foundation	Advocacy strategy for ESA developed and ESA strengthened membership retention and resource mobilization plans developed.	2026

Section 6:

Budget

This section presents a summary of the budget needed to implement the seed sector strategy (Table 9). The budget is broken down by components and sources of funding. It is broken down into costs for the development of human resources, systems, and infrastructure. It also includes procurement costs.

The strategy will be funded through private and public investments. The private investments are expected to be mainly by actors engaged in seed production and marketing (public seed enterprises, private seed companies) with a facilitation role of the government in ensuring access to finance through different approaches, including the provision of loan guarantees. The public investments are expected to come from both the government and development partners. The total cost of the interventions designed under this strategy is USD 65,009,264. It is drawn from interventions and activities indicated under NSSD, MoA 10 in 10 and EAA projects.

Table 11: *Summary of costs needed to implement seed sector strategy (US $)*

Component	Source	Total	Human resource	System	Infrastructure development	Procurement
National Agricultural Research and breeding effectiveness	Government	1,625,780	216,133	193,481	841,912	374,254
	Other sources	3,504,828	654,800.20	450,609.40	1,502,979.40	896,439.40
	Sub-total	**5,130,608**	**870,933.20**	**644,090.40**	**2,344,891.40**	**1,270,693.40**
Early Generation Seed Production and Distribution	Government	6,057,521	814,167.0	1,101,519.2	2,338,088.3	1,803,746.4
	Other sources	13,481,199	2,388,118.8	2,396,336.1	4,990,437.2	3,706,306.6
	Sub-total	**19,538,720**	**3,202,285.8**	**3,497,855.3**	**7,328,525.5**	**5,510,053.0**
Commercial Seed Production and Marketing: certified seed production	Government	2,313,360.35	382,410.98	433,383.58	1,159,298.04	338,267.62
	Other sources	3,624,047.35	867,545.25	1,092,861.21	685,735.30	977,905.60
	Sub-total	**5,937,407.70**	**1,249,956.23**	**1,526,244.79**	**1,845,033.33**	**1,316,173.22**
Commercial Seed Production and Marketing: seed marketing	Government	4,296,240.65	710,191.82	804,855.22	2,152,982.07	628,211.29
	Other sources	6,730,373.65	1,611,155.46	2,029,599.39	1,273,508.41	1,816,110.40
	Sub-total	**11,026,614.30**	**2,321,347.28**	**2,834,454.61**	**3,426,490.47**	**2,444,321.69**
Policy, Legal Regulatory in Ethiopia	Government	2,195,179	344,675.0	306,250.0	825,000.0	719,254.0
	Other sources	5,197,445	817,686.2	575,504.2	2,704,254.2	1,100,000.0
	Sub-total	**7,392,624**	**1,162,361.2**	**881,754.2**	**3,529,254.2**	**1,819,254.0**
Quality Assurance in Ethiopia	Government	2,195,179	344,675.0	306,250.0	825,000.0	719,254.0
	Other sources	5,197,445	817,686.2	575,504.2	2,704,254.2	1,100,000.0
	Sub-total	**7,392,624**	**1,162,361.2**	**881,754.2**	**3,529,254.2**	**1,819,254.0**
National Planning and coordination	Government	2,816,000	871,000	665,000		1,280,000
	Other sources	5,774,668	1,735,116.90	1,296,516.90	1,011,516.90	1,731,516.90
	Sub-total	**8,590,668**	**2,606,116.90**	**1,961,516.90**	**1,011,516.90**	**3,011,516.90**
Total	Government	21,499,260	3,683,253	3,810,739	8,142,280	5,862,987
	Other sources	43,510,005	8,892,109	8,416,931	14,872,686	11,328,279
	Total	**65,009,264**	**12,575,362**	**12,227,670**	**23,014,966**	**17,191,266**
Proportion (%)	Government	**0.3**	**0.3**	**0.3**	**0.4**	**0.3**
	Other sources	**0.7**	**0.7**	**0.7**	**0.6**	**0.7**

Seed is one of the critical inputs necessary for bringing significant change to crop production and productivity in order to ensure food security. The MoA has the intention of increasing crop production from 349 million qt in 2020 to 593 million qt in 2030. To realize this, the MoA has the responsibility of spearheading the transformation of the Ethiopian seed system to meet these targets. A well-functioning system ensures the availability of quality assured seed at the right time and competitive price to the end users.

Until 2020, only 10% of the more than 1,413 publicly owned crop varieties were commercialized, of which over 85% were released and registered in the country. Regarding certified seed production and marketing, despite the potential demand of 7 million qt, only 1.1 million qt was supplied to farmers in 2021; of these, the share of maize, wheat and pulses is 67.4%, 15.8%, and 2.4% of the total area covered, respectively. The total share for oilseed, forage and vegetables is below 1%. Besides the limited volume of seed delivery, smallholder farmers also complain about the seed quality.

In recognition of these limiting situations, the MoA had developed the ten-in-ten project with the aim of increasing the productivity of ten selected commodities in the coming decade through all-rounded interventions. The major components, intervention and estimated budget is shown in Table 10.

Table 12: *Seed sector development proposed budget for implementing MoA 10-in-10 plan*

Component	Source	Total	Human resource development	System development	Infrastructure development	Procurement
National Agriculture Research and Breeding Effectiveness	Government	983,345.5	144,000.0	402,938.2	430,909.1	5,498.2
	Other sources	2,294,472.7	336,000.0	940,189.1	1,005,454.5	12,829.1
	Sub-total	**3,277,818.2**	**480,000.0**	**1,343,127.2**	**1,436,363.6**	**18,327.3**
Variety maintenance and breeder seed multiplication	Government	2,047,674.5		2,047,674.5		
	Other sources	4,777,907.3		4,777,907.3		
	Sub-total	**6,825,581.8**	**-**	**6,825,581.8**	**-**	**-**
Pre-basic and basic seed production (EGS)	Government	2,073,954.5	-	72,545.5	2,001,409.1	-
	Other sources	4,839,227.3	-	169,272.7	4,669,954.5	-
	Sub-total	**6,913,181.8**	**-**	**241,818.2**	**6,671,363.6**	**-**
Certified seed production	Government	1,285,147.6	898,909.1	386,238.5	-	-
	Other sources	2,998,677.8	2,097,454.5	901,223.3	-	-
	Sub-total	**4,283,825.5**	**2,996,363.6**	**1,287,461.8**	**-**	**-**
Seed marketing	Government	7,001,604.4	174,981.7	2,969,850.0	3,856,772.7	
	Other sources	16,337,077.0	408,290.6	6,929,650.0	8,999,136.4	
	Sub-total	**23,338,681.4**	**583,272.3**	**9,899,500.0**	**12,855,909.1**	**-**
Improving regulatory service	Government	8,850,000.0	873,257.7	833,907.3	4,824,775.0	2,318,060.0
	Other sources	20,650,000.0	2,037,601.3	1,945,783.7	11,257,808.4	5,408,806.6
	Sub-total		**2,910,859.0**	**2,779,691.0**	**16,082,583.4**	**7,726,866.6**
Seed sector coordination and leadership	Government	748,145.5	246,109.1	-	-	502,036.4
	Other sources	1,745,672.7	574,254.5	-	-	1,171,418.2
	Sub-total	**2,493,818.2**	**820,363.6**	**-**	**-**	**1,673,454.5**
Strategic seed reserve	Government	5,481,156.8	-	3,293,884.1	2,187,272.7	-
	Other sources	12,789,365.9	-	7,685,729.5	5,103,636.4	-
	Total	**18,270,522.7**	**-**	**10,979,613.6**	**7,290,909.1**	**-**
Seed sector Development	Government	11,439,340.9	3,041,618.2	5,593,677.3	2,783,113.6	20,931.8
	Other sources	26,691,795.5	7,097,109.1	13,051,913.6	6,493,931.8	48,840.9
	Total	**38,131,136.4**	**10,138,727.3**	**18,645,590.9**	**9,277,045.5**	**69,772.7**

Total	Government	39,910,369.8	5,378,875.7	15,600,715.4	16,084,252.3	2,846,526.3
	Other sources	93,124,196.2	12,550,710.1	36,401,669.3	37,529,922.0	6,641,894.8
	Total		**17,929,585.8**	**52,002,384.6**	**53,614,174.4**	**9,488,421.1**
Proportion (%)	Government	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
	Other sources	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**

The top ten priority interventions by component are presented in Table 13. Implementation of these prioritize will hasten the contribution of the seed sector to increased production of improved seed and facilitate private sector participation in the seed sector, The interventions seek to improved development of improved varieties and variety release process, provision of basic seed, enactment and implementation of policy instruments that create an enabling environment for a competitive seed sector, and improved coordination of the seed sector. The total cost of implementation of the ten priorities is US$ 38,181,780.60 which is about 59% of the total investment of the strategic plan.

Table 13: *Top ten priority interventions by component*

Component	Bottlenecks	Strategic intervention	Expected output	Financial resource (USD)
1. National Agricultural Research and Breeding Effectiveness	Weak human resources capacity due to poor training, recruitment, and retention system.	1. Competitive research human capacity building.	Motivated with required skills, scientific staff in place	870,933.20
	Research efforts inadequately aligned with government priorities and demands of stakeholders.	2. Revise the national crop improvement program strategy.	Functional and efficient national agricultural research system established.	644,090.40
2. Early Generation Seed Production and Distribution	Absence of suitable business models such as variety licensing, public-private partnerships	3. Commercialization of public varieties.	Improved access to EGS of demanded crops and varieties.	3,497,855.30
	Limited infrastructure, logistics, and operational budget.	4. Invest in physical facilities for early generation seed production.	Capacity of early generation seed production enhanced.	7,328,525.50
3. Commercial Seed Production and Marketing	Restrictive enabling environments, lack of transparent playing field for private and public seed companies.	5. Ensure the implementation of the seed policy to enhance a competitive seed sector. Promote an equitable access to early generation seed.	Available good seed business environment.	4,360,699.40
	High cost of entry to operate for small-and-medium seed companies limited access to financial services.	6. Promote market led seed production and marketing for public seed enterprises and seed coops.	Market oriented seed sector .	5,271,523.80

4. Policy, Legal Regulatory Services	Testing requirements not customized by crop, discretionary approval criteria, and institutional weaknesses.	7. Building institutional capacity and resources to conduct Distinctness, Uniformity & Stability and Value for Cultivation and Use tests for the execution of Plant Breeder's Rights and Variety Registration.	National capacity built for proper execution of Plant Breeder's Rights and Variety Registration.	2,044,115.40
	Limited agricultural financing sectors and loan guarantees.	8. Mobilizing funding for public institutions, including both national and regional research institutes and regulatory authorities.	Public institutions capacitated to play expected role.	3,529,254.20
5. Quality Assurance System	Inadequate organizational setup limiting the chance to attract more qualified and experienced staff.	9. Develop required human and physical capacity for quality assurance.	Required number of professional staff made available and physical capacity/ infrastructure built	2,044,115.40
6. National Planning and Coordination	Lack of institution responsible for administration and implementation of seed policy.	10. Established functional seed sector governance structure.	Effective national seed sector coordination mechanism established.	8,590,668
7. **Total**				**38,181,780.60**

Section 7:

Implementation arrangements

The complexity of the proposed interventions and the need to engage diverse actors in the seed sector demands high-level coordination to ensure effective implementation of the project targeting the two major areas of intervention: policy and development.

The policy related interventions require policy decisions by the Federal Ministry of Agriculture. Once the policy directions are given, specific interventions will require detailed planning and approval from other public institutions. This will demand preparation of relevant documents and follow up of application and approval. In addition, there will be a need to systematize and combine all the interventions that require this type of process. Thus, it will be important to designate a relevant directorate within the MoA for follow up and implementation.

Development interventions are of two types. The first are those that can be implemented through mainstreamed public investment with existing human expertise. The second types are those that require mobilization of resources from the private sector along with additional expertise.

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