TANZANIA SEED SECTOR INVESTMENT PLAN

MAY 2025

MINISTRY OF AGRICULTURE

Tanzania Seed Sector Investment Plan (2025-2029)

MAY 2025

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ACRONYMS

AASS	Annual Agriculture Sample Survey
AATF	African Agricultural Technology Foundation
AFAP	African Fertilizer and Agribusiness Partnership
AfDB	African Development Bank
AGRA	Alliance for a Green Revolution in Africa
ARIPO	African Regional Intellectual Property Organization
ASA	Agricultural Seed Agency
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
ASDP II	Agriculture Sector Development Support Programme Phase Two
ASIs	Authorized seed inspectors
ASPIRES	Agricultural Sector Policy and Institutional Reforms Strengthening
BMGF	Bill & Melinda Gates Foundation
BoT	Bank of Tanzania
BVRM	Breeding, variety release and maintenance
CIAT	International Center for Tropical Agriculture
CIMMYT	International Maize and Wheat Improvement Center
CIP	International Potato Center
COMESA	Common Market for Eastern and Southern Africa
CRS	Catholic Relief Services
DANIDA	Danish International Development Agency
DCD-CPAIC	Directorate of Crop Development - Crop Promotion, Agricultural Inputs, and Cooperatives
DNA	Deoxyribonucleic acid
EAC	East African Community
EGS	Early Generation Seed
ESSETA	Enhancing the Seed Sector in Tanzania
FAO	Food and Agriculture Organization
FAP	Farmer Awareness and Participation
FY	Fiscal Year

GE	Genome Editing
GDP	Gross Domestic Product
GMO	Genetically modified organisms
ICRISAT	International Crops Research Institute for Semi-Arid Tropics
ICT	Information Communication Technology
IFAD	International Fund for Agricultural Development
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
IPPC	International Plant Protection Convention
IRRI	International Rice Research Institute
ISSD	Integrated Seed Sector Development
ISTA	International Seed Testing Association
JICA	Japan International Cooperation Agency
LGA	Local government area
MAFC	Ministry of Agriculture Fisheries and Cooperatives
MLN	Maize lethal necrosis
MoA	Ministry of Agriculture
mt	Metric tons
MVIWATA	Mtandao wa Vikundi vya Wakulima Tanzania
NARS	National Agricultural Research System
NGO	Non-Governmental Organization
NPC	National Planning and Coordination
OECD	Organization for Economic Co-operation and Development
OPV	Open Pollinated Variety
PBR	Plant Breeder's Rights
PIATA	Pan-African Partnership for Inclusive Agricultural Transformation in Africa
PLR	Policy, Legal and Regulatory
QA	Quality Assurance
QCSP	Quality Commercial Seed Production
QDS	Quality Declared Seed
RUCODIA	Ruvuma Commercialization and Diversification of Agriculture
SADC	Southern African Development Community

SCU	Seed Coordinating Unit
SeedSAT	Seed System Assessment Tool
SMD	Seed Markets and Distribution
SSA	Sub-Saharan Africa
SUA	Sokoine University of Agriculture
TA	Thematic Area
TARI	Tanzania Agricultural Research Institute
TASAI	The African Seed Access Index
TASTA	Tanzania Seed Trade Association
TBS	Tanzania Bureau of Standards
TOAS	Tanzania Online Application System
TOSCI	Tanzania Official Seed Certification Institute
TPHPA	Tanzania Plant Health and Pesticides Authority
TPRI	Tropical Pesticides Research Institute
TRA	Tanzania Revenue Authority
TZS	Tanzania Shillings
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UDSM	University of Dar es Salaam
UPOV	International Union for the Protection of New Varieties of Plants
URT	United Republic of Tanzania
USAID	United States Agency for International Development
USD	United States Dollar
WTO	World Trade Organization

GLOSSARY OF KEY TERMS

Term	Meaning
Basic seed	It is the progeny of breeder or pre-basic seed and is produced under conditions that ensure genetic purity and identity. It can be produced by an individual or organization other than the plant breeder, hence a requirement for detailed and accurate description of the variety for use as a guide for eliminating impurities ("off types") during production. Basic seed is the term used in Tanzania.
Breeder seed	Seed of a released variety produced by or under the direction of the plant breeder who selects the variety based total parental control on the genotype and phenotype of the plants. Breeder seed is produced under the highest level of genetic control to ensure the seed is genetically pure and accurately represents the variety characteristics identified by the breeder during variety selection.
Pre-basic seed	It is the progeny of breeder seed. Pre-basic seed is a class of seed between breeder and basic seed and is used for basic seed production; and may be done by the seed producing entity under breeder observation. The foundation seed-producing entity produces pre-basic seed under very high levels of genetic control.
C1 and C2	Certified First Generation (C1) is a seed progeny derived from basic seed whereas Certified Second Generation (C2) is seed progeny derived from multiplication of C1. Multiplication of C2 to C3 and C3 to C4 seed classes happen where regulations and respective crop seed protocols allow.
Certified seed	Certified seed is the most rigorous category of Quality Assured seed. It can apply to seeds of various classes, namely: breeder, pre-basic, basic, and certified commercial.
Commercial seed	Any class of certified seed acquired through purchase and used to plant farmer fields.
Early Generation Seed (EGS)	This term refers collectively to breeder seed, pre basic and basic seed that is used in seed production processes.
Effective demand	Effective demand refers to demand from customers who both: 1) want to purchase the product under consideration; and 2) have the financial means to make the purchase.
Formal seed system	This is a highly regulated seed development, production, processing and distribution system that comprises key steps such as: varietal development and release; early generation seed (EGS) production; and commercial seed production, processing, marketing, and distribution to agro-dealers and farmers.
Hybrid seeds	Seeds that are developed by crossing two or more different parental lines of the same crop under highly controlled circumstances. Crossing involves taking pollen from one plant (the male) and transferring it to the female plant. Hybrid varieties often feature desirable traits like disease resistance, high productivity, early maturity, etc.
Informal seed system	Systems where farmers, especially smallholder farmers, plant recycled seed obtained either directly from their own harvest, through exchange and barter among friends, neighbors, and relatives, or through local grain markets. These seeds are generally of unknown quality.
Licensee	An entity authorized to commercially exploit the varieties developed by the NARS, is usually a private seed company that is registered in the country in which the agreement was created and has the experience and market penetration to multiply and commercialize the variety.
Licensor	A public or private research entity that develops and owns crop varieties that are made available to licensees for production of commercial seed.
Open pollinated variety (OPV)	A variety that is reproduced through open pollination (e.g., a natural process such as win or insects) instead of a controlled pollination process.
Plant breeders' rights	Exclusive rights to market a new plant variety for 15 to 20 years granted to its breeding institution or breeder pursuant to UPOV, so that anyone who wishes to produce the protected variety must obtain the breeding institution's or breeder's prior authorization. Institutions/breeders granting such authorization usually do so through licensing, which may include the obligation to pay royalties to the institution/breeder.
Planting material	Planting material (PM) refers to any material (seed, roots/tubers, seedlings, cuttings etc.) that farmers plant with the intention of producing a crop.
Quality Assured (QA) seed	QA seed is seed which has been intentionally produced to meet national mandated quality standards (generally for purity, germination, vigour, and freedom from pests, diseases and foreign matter) and for which the quality has been assured according to national regulations and processes. QA seed undergoes testing by the national seed regulatory authority or their designee, in accordance with the regulations that apply to the class of seed, to verify that the quality standards have been met or exceeded.
Quality Declared Seed (QDS) system	The QDS system is a seed-producer implemented system for production of seed that meets a minimum standard of quality and entails lower levels of sampling than certified seed.
Seed demand forecasting	Is the effort to project the amount of seed for a specific crop required annually to meet effective demand in the market (purchase and sale).
Seed recycling	The process of saving plant material and reusing it from season to season or year to year. However, with subsequent cycles the planting material often loses viability and vigour, as insects, diseases and/or poor storage erode seed quality. This, in turn, depresses farmer crop yields.

Term	Meaning
Semi-formal seed system	The semi-formal seed system is the intersection of the formal and informal seed systems, e.g., a community-based seed production system involving individual farmers or farmer cooperatives producing Quality Declared Seed (QDS). It is less demanding and less expensive than full seed certification systems yet tries to promote a satisfactory level of seed quality. Not all countries permit QDS or equivalent semi-formal systems.
True breeding	It is a kind of reproduction where the parents produce offspring that would carry the same phenotype (physical expression) and genotype (genetic expression). This means that any crosses performed will result in offspring with the same phenotype, indicating that the organism is homozygous for every gene. It is commonly done in legumes where the plants are nearly hundred percent self-pollinating.

FOREWORD

The agricultural sector stands as the backbone of Tanzania's economy, providing sustenance and employment to a majority of the population. The importance of a robust and efficient seed industry cannot be overstated, as it forms the genesis of agricultural productivity and food security. Tanzania's seed sector investment plan is pivotal in addressing the challenges and harnessing the opportunities within this critical sector.

The Seed Sector Investment Plan for Tanzania is designed to address key issues in the seed sector that hinder productivity and growth. This follows a comprehensive analysis of the Tanzania seed system using the Seed Systems Assessment Tool (SeedSAT) that gave recommendations that are specific to various segments of a viable seed system. Despite strengthened and expanded upstream supply of seeds, challenges remain. Although there are notable recent increases in the use of improved seeds for certain crops, with the expectation of hybrid maize, the informal seed system, approximately 75% of the seed market, still dominates. Consequently, average productivity remains well below potential levels.

The informal seed system continues to play a dominant role in the seed market, covering approximately 75% of the market share. This prevalence is largely due to the limited reach and adoption of formal seed systems. Informal seeds, though readily accessible, often lack the quality and genetic potential necessary for high yields. This disparity is a significant actor contributing to the suboptimal average productivity observed across various crops. To shift the balance from informal to formal seed systems, significant efforts must be directed towards strengthening the formal seed system. This involves enhancing the capacity and reach of seed producers, ensuring quality standards are met, and increasing the availability of improved seed varieties.

Particular attention is needed to promote the use of improved seeds among farmers. Education and extension services play a crucial role in this regard, helping farmers understand the benefits of improved seeds and how to effectively use them. Additionally, providing access to affordable improved seeds can facilitate wider adoption.

The Seed Sector Investment Plan for Tanzania delineates several key investment opportunities aimed at revitalizing the seed sector. These opportunities span various aspects of the seed value chain, from research and development, regulatory, production, and distribution to national planning and coordination.

In closing, I would like to sincerely thank the institutions and individuals who contributed to creating the Seed Sector Investment Plan.

Hon. Hussein M. Bashe
Minister for Agriculture

ACKNOWLEDGMENT

The Seed Sector Investment Plan has been developed through a highly consultative process with a broad range of stakeholders. The Seed Sector Investment Plan follows a comprehensive study of the seed sector in Tanzania. In December 2023, the Seed Systems Assessment Tool (SeedSAT) was used to study Tanzania's formal seed sector, with a total of 177 indicators assessed and scored across eight thematic areas. The assessment led to the identification of key areas of underperformance in the seed sector, and consequently provision of recommendations aimed at sustainably fostering seed systems improvement in the country, thereby contributing to enhanced food security and improved livelihooods of smallholder farmers.

The Ministry of Agriculture wishes to extend its appreciation towards the initiatives and support during the development of Seed Sector Investment Plan which made possible through contributions of various agricultural sector stakeholders. The Ministry of Agriculture appreciates the leadership of the Department of Crop Development (DCD), the task team that worked tirelessly to ensure that the Seed Strategy and Investment plan is developed. The ministry is also thankful to its other departments and agencies such as Agriculture Extension, Tanzania Agricultural Research Institute, Tanzania Official Seed Certification Institute, and Agricultural Seed Agency.

The ministry, particularly, appreciates technical and financial support from AGRA. We would also like to acknowledge valuable inputs from Agri Experience who facilitated the development process, and all stakeholders for their input into the Investment Plan, including Tanzania Seed Trade Association, Seed companies, and Tanzania National Agrodealer Association.

Gerald G. Mweli
Permanent Secretary

EXECUTIVE SUMMARY

The seed sector in Tanzania has been growing steadily over the last ten years, in tandem with overall economic development of the country. For example, Tanzania moved upwards to become a lower middle-income country in July 2020, and its Gross Domestic (GDP) growth has averaged 6.5% per year over the last twenty years (AFDB, 2023). Tanzania's strategic position with a seaport serving neighboring several countries, huge arable land, a stable political environment, and a large population that practices agriculture, places her in a competitive position as a producer and net exporter of food crops such as maize. According to the Director of Crop Development of the Ministry of Agriculture, there is evidence to show that Tanzania's food crop exports have been growing at a faster rate than the traditional cash crop exports of coffee, tea, and cashew (Personal communication, July 2023).

Recognizing the great potential of the food crop sector, both for local use and for exports, the United Republic of Tanzania (URT) has singled out the agriculture sector as a key driver to reducing poverty, increasing food security, creating youth and women employment, and initiated programs to transform agriculture into a business. The URT has increased funding for the agricultural sector, which has also received support from bilateral donors such as the International Fund for Agricultural Development (IFAD), the World Bank and the African Development Bank.

Making quality seed available of crop varieties with desired attributes such as drought tolerance, disease and pest resistance, and nutritional aspects is one of the key drivers for improving the sector. AGRA launched the Center for Excellence for Seed Systems in Africa (CESSA) in September 2021, which aims to lead the linkage to and delivery of practical and high-quality knowledge, information, tools and models for functional seed s ystem development. CESSA conducts a seed sector health test by using the Seed Systems Assessment Tool (SeedSAT), which analyzes the functionality of eight thematic areas of a national seed system to identify gaps and make prioritized recommendations for intervention.

AGRA completed SeedSAT for Tanzania in December 2023, leading to the current step of engaging in dialogue with the Ministry of Agriculture and seed sector stakeholder representatives to agree on prioritized solutions and subsequently inform the development of the investment plan for the seed sector. This document has been created in collaboration with key stakeholders.

The approach for developing the investment plan included extensive literature review tied to SeedSAT findings and additional seed sector-related documents that are available. There were several in-person and remote meetings with key stakeholders to understand the current situation, challenges and future prospects. There is a lot of government intervention to strengthen the sector, and these efforts were taken into account. While the focus of the investment plan is on the proposed costed interventions, the report also examines the internal strengths and weaknesses, and external opportunities and challenges, as justification for the priority initiatives. The report highlights the recognition of the importance of sector-wide coordination led by the Seed Coordination Unit of the Ministry of Agriculture, to collect data and share relevant information required to drive growth in the sector. The gaps identified across the sector were validated with stakeholders drawn from the key institutions in the seed sector.

The investment plan recommends eleven intervention strategies for funding, with a corresponding 39 sub-interventions. The total budget proposed is $18,974,850, over five years.

By developing this investment plan that clearly shows where the gaps are and what priority interventions are required to improve the seed sector, it is anticipated that interested donors will work with the government and other key stakeholders to identify areas of interest within the investment plan that they can fund, thus achieving stronger, coordinated results in partnership with the URT.

Focus of seed sector investment plan

The seed sector investment plan is national in scope and engaged both public and private partners working in the seed sector during its formation. The investment plan is aligned with the national strategies and projects such as ASDP II, Agriculture Masterplan 2050 and Agenda 10/30, whose aims are to promote agricultural productivity and transform agriculture into a business. The duration of the investment plan is five years, from 2025 to 2029.

Seed is a key input in food production, and the use of quality seed accompanied by other critical inputs and practices is required in order to improve crop yields. Agenda 10/30 highlights low use of improved inputs as one of the factors that negatively impacts agricultural production. The focus of the investment plan, therefore, is the Tanzania Official Seed Certification Institute's (TOSCI's) quality assured seed[1], i.e., seed which has been intentionally produced to meet quality standards (generally for genetic purity, germination, vigour, and freedom from pests, diseases and foreign matter), and for which the quality has been assured through mandate regulatory quality assurance processes by TOSCI.

The Government of Tanzania has identified thirteen food crops to be prioritized through Agenda 10/30, which are grouped into three crop segments, namely: cereals (maize, rice, sorghum, wheat and barley), legumes (bean, cowpea, soybean, green gram, chickpea) and oil crops (sunflower, sesame, groundnut). These crops are not only important for food security but also have a high potential for export. Maize and rice exports, for example, increased by almost five and a half times and over one and a half times respectively, between 2020 and 2022 (Director of Crop Development, MoA, personal communication, July 2023). A report of the seed demand forecast spearheaded by Agri Experience for ten of the thirteen crops is available, which will be useful in planning for seed production support to the sector (Ministry of Agriculture - URT, 2023). The investment plan will focus on the thirteen crops mentioned above. However, data for green grams, lentils and barley is mostly unavailable, and may pose a challenge in planning. With more coordinated focus to address production challenges of these crops, it is expected that there will be increased yields and more agricultural produce will be available for local and export markets.

This investment plan supports seed production of all classes of seed. The main focus is accelerated production of certified seed, but special attention will be given to maintenance and production of early generation seed (breeder, pre-basic and basic seed), which is required for the production of commercial certified seed by seed companies. This investment plan will not focus on planting material produced by the informal sector but will focus on planting material that is subjected to the quality assurance process managed by TOSCI.

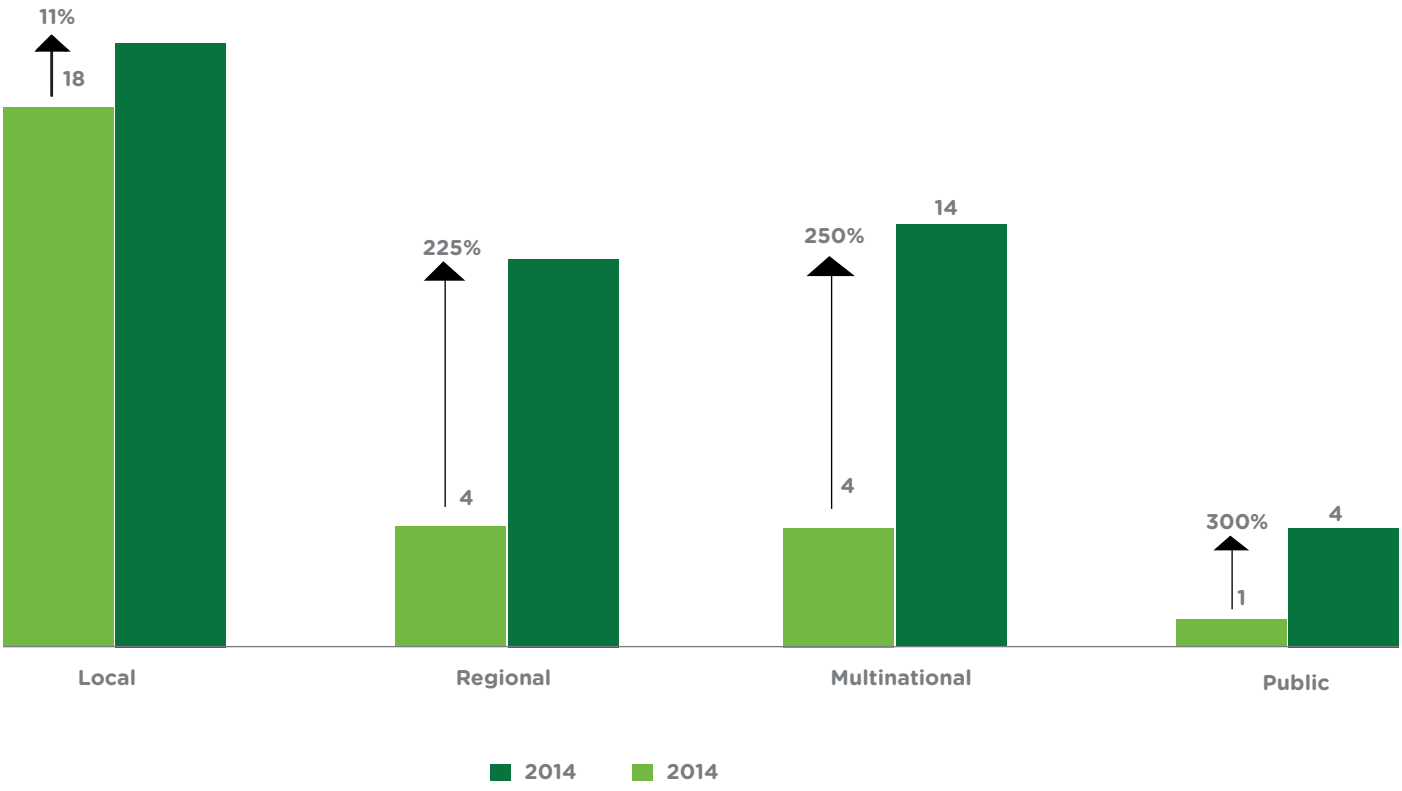
1 TOSCI is the government institution responsible for the certification and control of agricultural seed either locally produced or imported. TOSCI provides quality assurance for both certified seed, and Quality Declared Seed through Local Government District Authorized Inspectors.

BACKGROUND

Agriculture contributes 28% to Tanzania's GDP, making it the largest contributor to the economy. Agriculture further employs over 65% of the country's workforce. It provides livelihoods to 70% of the population, three-quarters of whom are smallholder farmers. Agriculture is also a key driver for industrialization and value-addition in the agro-processing industry (ADB, 2023). The Government of Tanzania recognizes the strategic importance of agriculture in the country's development and has put in place a number of measures to stimulate investment and growth in the sector, with a strong focus on supporting youth and women. The measures include the Agriculture Sector Development Program, Agenda 10/30, Tanzania Development Vision 2025 (TDV 2025), and the third National Five-Year Development Plan (FYDP III).

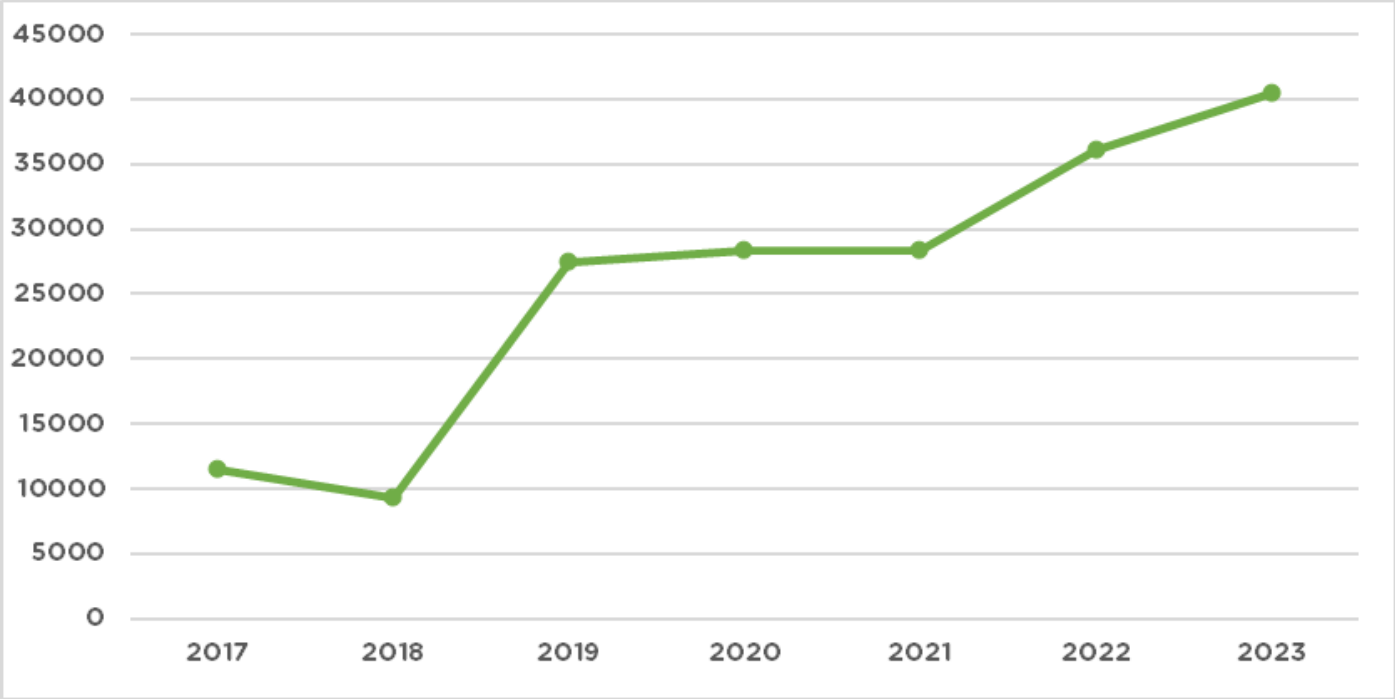
Agriculture is considered the most viable pathway for the country to improve in areas such as poverty, unemployment, malnutrition and food insecurity. In support of this pathway, the seed sector in Tanzania has been growing steadily in the recent past. The number of seed-producing companies increased from 27 in 2014 to 51 in 2024 (TOSCI). Figure 1 represents comparison by category of the number of active seed companies in 2014 and 2024.

Figure 1: Comparison of number of active seed companies in 2014 and 2024



There have also been corresponding increases in the volumes of certified seed produced, especially for maize, over the last seven years as shown in Figure 2.

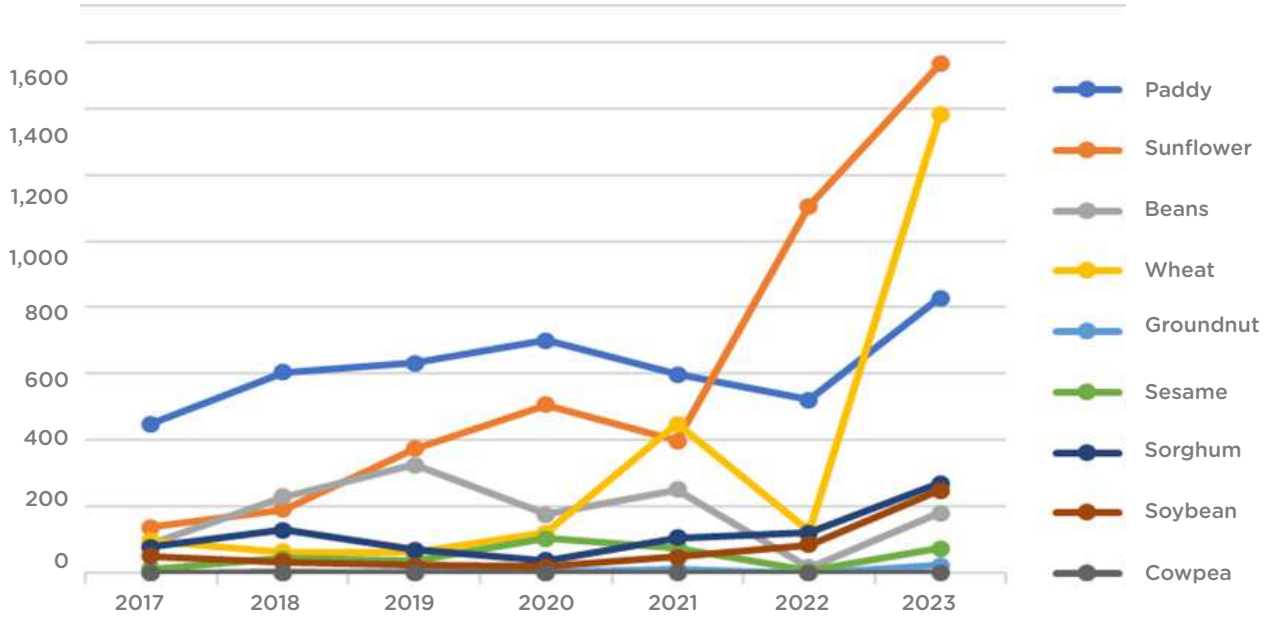
Figure 2: Certified seed volumes for maize in mt (2017-2023)



Source: TOSCI, 2024

The growth in certified seed volumes, however, is much slower for non-maize crops with the exception of sunflower and wheat, although these volumes are still very low at 1,535 mt and 1,381 mt in 2023, respectively (Figure 3).

Figure 3: Certified seed volumes for non-maize priority crops in mt (2017-2023)



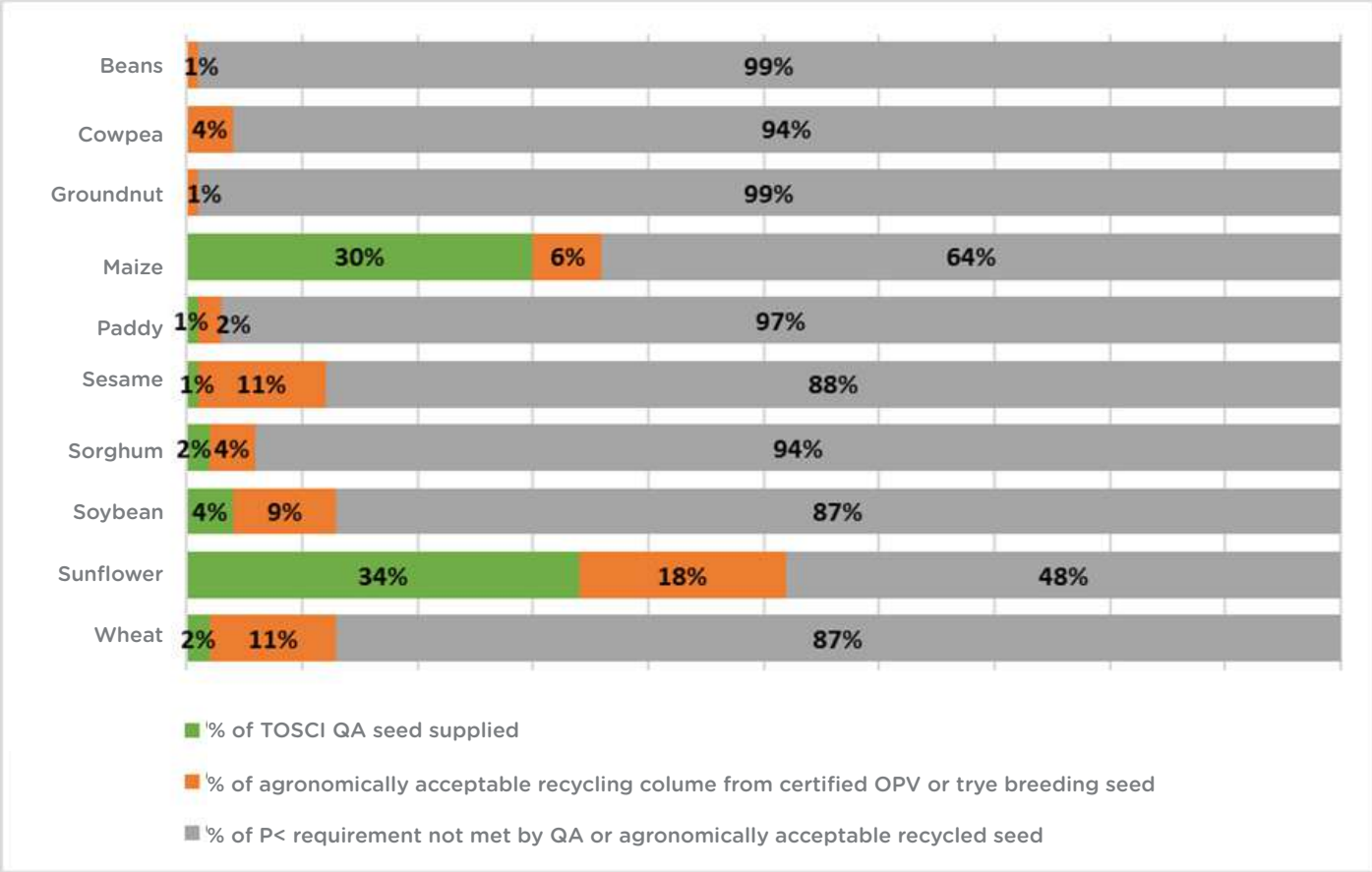
Source: TOSCI, 2024

Through the Bill and Melinda Gates Foundation's project, "Enhancing the Seed Sector in Tanzania (ESSETA)", several improvements have already been made to infrastructure and capacity for seed quality assurance, seed sector coordination capability and infrastructure, and to a lesser extent, early generation seed production. ESSETA's main objective was *"to increase efficiency, coordination and performance of key public institutions in Tanzania to enable a healthy and sustainable private sector-oriented seed sector that delivers a wide range of high-quality seed and varieties to farmers and other end users."* Some of the outcomes, such as the digitization of seed certification services, authorization of private inspectors and analysts, development of the Tanzania Agri-in-

put Platform, and the development of seed demand forecasts for ten priority crops, among other achievements, have already put the seed sector on an even stronger, enhanced growth trajectory, with a strong focus on supporting private sector investment.

Results from a recently concluded Seed Demand Forecast conducted by the Ministry of Agriculture show that there is a huge opportunity for increased seed sales at agrodealer retail outlets, where most agrodealers believe they can sell significantly larger volumes of quality assured seed of maize, beans, sunflower, paddy and wheat than they are selling now – if the seed was availed to them. The fact that farmers would be willing to purchase more volumes of certified seed if available is evident from Figure 4, which illustrates seed sources of ten of the crops selected for strategic planning. The figure shows that for most crops, more than 85% of planting material is supplied from unknown, informal sources, which are neither quality assured, nor do they fall within the acceptable recycling requirement.

Figure 4: Sources of planting material for focus crops in 2022



Source: Seed Demand Forecasting report, 2023 (MoA, URT)

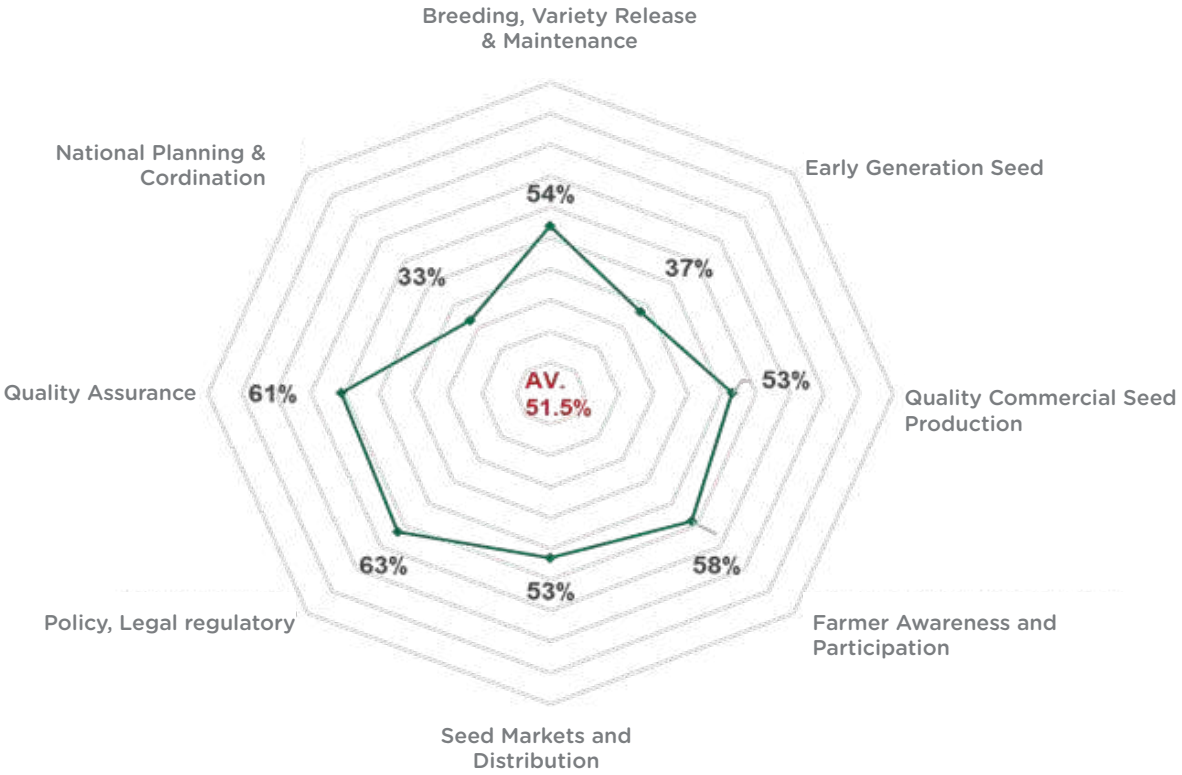
AGRA, through the support of the Bill and Melinda Gates Foundation (BMGF) designed and built a seed systems assessment tool (SeedSAT) during the period from 2020-22, and subsequently carried out a SeedSAT assessment for Tanzania in 2023, focusing on the eight thematic areas that comprise a functional seed system. SeedSAT examined 166 indicators for the eight thematic areas, as shown in Figure 5.

Figure 5: SeedSAT Thematic Areas

Source: Seed Demand Forecasting report, 2023 (MoA, URT)

Through the SeedSAT assessment which was carried out in collaboration, and later validated, with a large and diverse group of stakeholders, relative strengths and weaknesses across standardized indicators were established for Tanzania's seed system. Figure 6 is a radar chart representation of the benchmark scores for the eight thematic areas as established by the assessment.

Figure 6: SeedSAT scores for Tanzania seed sector



Source: AGRA, Tanzania SeedSAT Assessment Report, 2024

The average performance across the thematic areas was 51.3% with the best performance being Policy, Legal, and Regulatory at 63%, closely followed by Quality Assurance at 61%. The weakest is National Coordination and Planning at 33%, while Early Generation Seed also showed severe weakness. The scoring results point to the need for very targeted and bold interventions to improve the seed sector, particularly in light of its high potential.

To understand how the seed system in Tanzania functions, and areas that may need additional investment to strengthen, the consulting team reviewed the detailed SeedSAT materials for the thematic areas listed above, in addition to other relevant literature. A full listing of the bibliography is included in Annex 1. Gaps were identified across the seed sector's eight TAs as shown in Annex 2. The gaps include infrastructure inadequacy, funding constraints, capacity requirements, low adoption of certified seed use by farmers, institutional weaknesses, and policy and coordination gaps, among others.

The investment plan and costing presented later in this report are based on a thorough review of SeedSAT results and consultations with the key stakeholders in the seed sector.

Stakeholder overview

There are seven key MoA and government institutions involved in the seed sector. Table 1, 2, 3 and 4 below provide brief descriptions of the functions of these institutions.

Table 1: Public sector stakeholders

Tanzanian institutions supporting the seed sector		
#	**Actor/stakeholder**	**Description**
1	Seed Coordination Unit (SCU)	The SCU is functional team under the Directorate of Crop Development - Crop Promotion, Agricultural Inputs, and Cooperatives (DCD-CPAIC) in the Ministry of Agriculture (MoA), responsible for providing coordination and planning services for seed production, distribution, and accessibility by the farming communities in Tanzania.
2	Tanzania Official Seed Certification Institute (TOSCI)	TOSCI is a government institution under the Ministry of Agriculture established under the Seed Law no. 18, 2003 (The Act makes provisions for the control and regulation for agricultural seed). The institution is responsible for verifying and promoting the best agricultural seeds produced or imported into the country for sale and to protect the farming community against inferior and/or counterfeit seeds from agricultural input sellers. TOSCI headquarters is located in Morogoro Municipality and has four zonal branches that coordinate all seed quality control and certification in the respective zones: Northern Zone (Arusha); Southern highlands Zone (Njombe); Lake Zone (Mwanza); Southern Zone (Mtwara) and Western Zone (Tabora). TOSCI has recently enhanced the seed certification process through the development of an extensive online application system, increased use of electronic labels to control fake seeds, laboratory upgrades, construction of genetic reference library and moving to decentralize seed certification through online application service. TOSCI is a member of OECD and ISTA and has an ISTA-accredited laboratory in Morogoro. Reports indicate that 20-25% of farmers in Tanzania use seed certified by TOSCI. (USAID-FtF, 2022). TNBS estimated certified seed usage at 20% in 2021.
3	Tanzania Agricultural Research Institute (TARI)	TARI is a semi-autonomous body under the Ministry of Agriculture, responsible for all agricultural research activities conducted by the National Agricultural Research System (NARS) in Tanzania. It was established by the Parliamentary Act No. 10 of 2016 to enhance and strengthen the agricultural research system in the country. TARI has a network of 9 research centers and 8 Sub Centres. The Centres are TARI Makutupora, TARI Ilonga, TARI Selian, TARI Ukiriguru, TARI Naliendele, TARI Mlingano, TARI Tumbi, TARI Uyole and TARI Kihinga. The Sub Centres are TARI Hombolo, TARI Dakawa, TARI Maruku, TARI Mikocheni, TARI Tengeru, TARI Kifyulilo, TARI Ifakara and TARI TARI Kibaha. TARI Headquarters is in Dodoma, Tanzania. Annex 3 shows the crop mandates of these research centers.

Tanzanian institutions supporting the seed sector		
#	**Actor/stakeholder**	**Description**
4	Tanzania Plant Health and Pesticides Authority (TPHPA)	TPHPA was established by Act No. 04 of 2020 to comply with the requirements of International Plant Protection Convention (IPPC) on sanitary and phytosanitary measures. The Plant Health Section under the Ministry of Agriculture and Tropical Pesticides Research Institute (TPRI) have been merged to form one Authority for the regulation of Plant Health and Pesticides matters. The establishment of the Authority intends to ensure smooth coordination, proper utilization of resources and removal of duplication of roles to enhance efficiency and effectiveness in service delivery.
5	Agricultural Seed Agency (ASA)	ASA was established under the Executive Agencies Act [Cap.245 R.E. 2002] in June 2006 as a semi-autonomous body under the Ministry of Agriculture, Food Security and Cooperatives. The key functions of ASA include producing, processing and marketing quality basic and certified seeds, promoting increased private sector participation in the seed industry development through establishment of public-private partnerships or joint ventures in seed production and distribution, expanding seed production and distribution networks so as to facilitate seed accessibility by farmers, and promotion of increased demand of certified seed by farmers by supporting production of varieties that address farmers' specific demands. The agency has 13 seed farms, estimated at 12,000 hectares, spread across the country with the potential to produce different seed crops (maize, beans, paddy, sunflower, sesame, sorghum, groundnuts, cowpea, green gram, wheat, chickpea and horticultural crops.) ASA was established under the Executive Agencies Act [Cap.245 R.E. 2002] in June 2006 as a semi-autonomous body under the Ministry of Agriculture, Food Security and Cooperatives. The key functions of ASA include producing, processing and marketing quality basic and certified seeds, promoting increased private sector participation in the seed industry development through establishment of public-private partnerships or joint ventures in seed production and distribution, expanding seed production and distribution networks so as to facilitate seed accessibility by farmers, and promotion of increased demand of certified seed by farmers by supporting production of varieties that address farmers' specific demands. The agency has 13 seed farms, estimated at 12,000 hectares, spread across the country with the potential to produce different seed crops (maize, beans, paddy, sunflower, sesame, sorghum, groundnuts, cowpea, green gram, wheat, chickpea and horticultural crops.)
6	Sokoine University of Agriculture (SUA)	SUA was first established on the 1st of July 1984 by Parliamentary Act No. 14 of 1984 through the amendment of Parliamentary Act No. 6 of the same year. Following the repeal of the Act, the University is now operating through the Sokoine University of Agriculture Charter, 2007 through the broad framework of the Universities Act, 2005. SUA focuses on the University's core functions of teaching, research and public service delivery, with a focus on agricultural sciences. In addition, the institution emphasizes capacity building, quality assurance, outreach activities, internal income generation and operationalization of the restructured University units. The university does research on beans for its own production.

Table 2: Private sector stakeholders

#	Organization	Description
1	Tanzania Seed Trade Association	TASTA is a non-governmental organization established and registered by the Registrar of Societies in 2002 to provide a forum for interaction and information sharing among seed companies; represents interests of the seed industry in Tanzania, Africa and globally; and promotes the development of the seed sub-sector. TASTA is a membership organization whose main role is to represent the interest of its members, provide forums where seed companies can interact, share information, and channel member challenges to the relevant government institutions. TASTA has a membership of 40 seed companies and 5 non-seed producing entities.
2	Seed companies	TOSCI has registered a total of 218 entities to produce and market seed. However, only 51 seed companies are said to be actively involved in production and distribution of seed (20 local, 13 regional, 14 multinational, 4 public). Annex 4 provides a list of these companies.
3	Agrodealers	Tanzania is estimated to have 7,189 agrodealers across the regions. This number is deemed inadequate to meet farmer needs, however, and the distribution is always skewed in favour of urban areas. The agrodealers are the main link between seed producers and farmers.
4	Mtandao wa Vikundi vya Wakulima Tanzania (MVIWATA)-National Network of Small-Scale Farmers Groups in Tanzania	MVIWATA is a national farmers organization founded in 1993 that brings together smallholder farmers from all regions of Tanzania in order to have a common voice to defend economic, social, cultural and political interests of smallholder farmers. The association aspires to empower smallholder farmers economically and socially through capacity building and undertake lobbying and advocacy especially by strengthening their groups and networks, facilitating communication and learning so that they are capable of defending their interests.

5	Ruvuma Commercialization and Diversification of Agriculture (RUCODIA)	RUCODIA was registered as an NGO in 2005 with six strategic objectives: forming and strengthening farmer organizations, strengthening inputs systems (access to improved seeds and fertilizers), facilitating market linkage and postharvest management, enhancing good agronomic and soil fertility management practices, agro-enterprise development and in policy dialogue engagement. RUCODIA was one of the five members of a consortium supported by AGRA in Western regions in implementing the Tanzanian PIATA-TIJA initiative. Under strengthening farm input systems, the organization has transformed the hitherto largely fragmented inputs distribution system into an efficient, commercially viable input supply infrastructure, thus enabling smallholder farmers' greater access to high quality fertilizer and seeds. This has been achieved through recruiting and strengthening agro-dealers, input wholesalers (hub agro-dealers) and agro-dealer networks, and facilitates and strengthens linkages with seed companies, ARIs, and fertilizer companies. It has also facilitated farmer organizations and other stakeholders to produce QDS to meet specific local seed demands. RUCODIA operates all over the country, and by 2022, it had reached two million farmers, implemented 50 projects, established 20 warehouses and reached 124 districts out of 184. In two regions alone, Kagera and Kigoma, RUCODIA recruited 596 and 803 agrodealers who reached 257,921 and 172,661 farmers respectively.

Table 3: International collaborating institutions

#	Organization	Description
1	Consultative Group on International Agricultural Research (CGIAR)	CGIAR is a consortium of research entities whose aim is to achieve sustainable food security and reduce poverty in developing countries through scientific research and research-related activities in the fields of agriculture, forestry, fisheries, policy, and environment. Examples of CG groups working in Tanzania are: Africa Rice (rice), Biodiversity International (banana and biodiversity), CIMMYT (wheat and maize), CIP (sweet potato & round potatoes), CIAT (beans), ICRISAT (sorghum & millet), IITA (bananas, cassava, legumes,soybeans, cowpeas)
2	International Seed Organizations	These are international organizations that regulate seed standards to facilitate cross border seed trade and include the following. The International Seed Testing Association (ISTA) is in charge of seed laboratory testing. Tanzania's ISTA-accredited lab was accredited in 2018. OECD Seed Schemes regulate standards related to seed imports and exports. TOSCI follows OECD field inspection rules and procedures. The International Union for the Protection of New Varieties of Plants (UPOV) us in charge of plant variety registration and Plant Breeder's Rights (PBR) protection. The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) is focused on intellectual property rights as they relate to trade. Tanzania is signatory to the Agreement on Trade-Related Aspects of Intellectual Property Rights as stipulated under WTO.
3	Regional organizations	Tanzania is a member of the Southern African Development Community (SADC) and the East African Community (EAC). SADC is implementing harmonized regulations for the registration of plant varieties across member states. EAC is yet to ratify the proposed seed protocols and regulations.

Table 4: Ongoing seed-related initiatives and investments

#	Development partner	Program/ intervention	Activity description	Implementing partners	Year/ Status	Budget (USD)
1	United States Agency for International Development (USAID)	Emergence deployment of sunflower and wheat (EDSW) seed project	• Enhancing supply of early generation seed (EGS) through upgrading infrastructural facilities at TARI Centers • Capacity building of seed companies in business development - support will be given to scale up certified seed production and dissemination-supported by business planning, networking, information access, and training for seed processors. • Farmer awareness and promotion of good agronomic practices including the training for agro-dealers and Village Based Advisors (VBAs). • Facilitation of public-private partnerships in the production and distribution of certified sunflower and wheat seeds • Catalyzing and facilitating private sector-led investments in sunflower and wheat seed supply chains. • Deliberately facilitate youth and women-owned agribusinesses in the sunflower and wheat value chains.	1. TARI - Ilonga, Uyole and Selian centers 2. Agricultural Seed Agency 3. Meru Agro 4. Ayegro Seed Company	Ongoing	$3 million

#	Development partner	Program/ intervention	Activity description	Implementing partners	Year/ Status	Budget (USD)
2	USAID	Accelerating Innovation and Development Initiative (AID-I)	• Interventions around Farmer Awareness and Participation and Seed Markets and Distribution thematic areas • Strengthen the capacity of downstream market actors (distributors, aggregators, processors and logistics providers) through business development, access to finance and linkage to upstream supply chain players (markets) • Training of VBAs to raise farmer awareness and increase adoption of the technologies • Training of agro dealers, SMES and VBAs to provide knowledge and access to input and output markets for smallholder farmers • Leveraging digital technology to improve efficiency, and information flow and build a strong business-driven ecosystem • Identification of key crop varieties for wheat, maize, soybean and groundnuts, variety maintenance, identifying appropriate varieties for commercialization, scale models for EGS and certified seed production, quality assurance, fertilizer recommendations and supply, variety fertilizer match and promoting use of blended fertilizers • Support the development of business plans and growth of national and regional seed companies in business development • Support the development of professional pitches to attract investments for SMEs and farmers. • CIMMYT: Baseline studies, adoption models • Provide coordination and support institutional capacity to develop, improve and implement seed and extension policies at national and regional levels • Link youths with financial institutions and climate finance mechanisms	1. Ruvuma Commercialization and Diversification of Agriculture (RUCODIA) 2. Tanzania Association of Professional Business Development service (TAPBDS) 3. Building Rural Incomes Through Entrepreneurship (BRITEN) 4. Community Development Initiative Support (CDIS) 5. Nyakitonto Youth for Development Tanzania (NYDT) 6. Actions for Development Programmes (ADP) - Mbozi 7. Sokoine University Graduate Entrepreneurs Cooperative (SUGECO) 8. CIMMYT	Ongoing	$ 5 Million
3	USAID	The Agriculture Sector Policy and Institutional Reforms Strengthening (ASPIRES)	• Development of Tanzania Seed Sector Strategy	Michigan State University (Food Security Group)	Ongoing	US$ 6 Million
4	USAID	Tanzania Agri-Finance Project	• Improves access to finance for smallholders, women, youth, and micro, small, medium (including large) enterprises (MSMiLs) in Tanzania by improving the agri-finance ecosystem and strengthening the capacity of both borrowers and lenders	Improving Economies for Stronger Communities (IESC)	Ongoing	US$ 3 Million
5	AFDB	Tanzania Agricultural Inputs Support Project (TAISP)	• Provision of wheat seed subsidy	Ministry of Agriculture (MoA)	Ongoing	-
6	IFAD		• Expansion of the Tanzania Agri-Input Platform's Agrodealer database	MoA	2023	-

#	Development partner	Program/ intervention	Activity description	Implementing partners	Year/ Status	Budget (USD)
7	The International Rice Research Institute (IRRI	Modernizing the rice sector to boost productivity and profitability	• Enriching seed systems: IRRI-Africa collaborates with partners to enhance rice seed quality and production in Tanzania.	TARI	2023	-
8	AECF (Africa Enterprise Challenge Fund)	The Seed for Impact Programme (SIP)	• The Seed for Impact Programme (SIP) – Tanzania Window funded by the Government of Sweden seeks to address the challenges faced by smallholder farmers (SHFs) in accessing seeds of improved and high-yielding climate-resilient crop varieties	AECF	2023	Min US$ 100,000 - Max US$ 200,000
9	CGIAR	Fruit and Vegetables for Sustainable Healthy Diets (FRESH)	• Seeds of Change: Enhancing availability of improved vegetable varieties in Tanzania	CGIAR	2023	-
`10	Netherlands Enterprise Agency (RVO)		• Tanzania - Netherlands partner to boost horticulture and seed potato production. The initiative has resulted in the creation of the Tanzania Horticulture and Potato Seed Platform (THPSP)	1. Tanzania Horticulture Association (TAHA) 2. TASTA 3. TOSCI	2023	-

Relevant policies and regulatory documents

Listed below are national, regional, continental and international policy instruments relevant to Tanzania's seed sector.

1. The Seed Act No. 18 of 2003
2. The Seed Regulations of 2007 read together with its Seed (amendments) Regulations, 2017; Seed (amendments) Regulations, 2020 and Seed (amendments) Regulations, 2023
3. The Plant Breeders' Rights Regulations of 2018
4. The Plant Health Act, 2020
5. The Plant Health Regulations, 2023
6. The Plant Breeders' Rights Act of 2012 (URT) and The Plant Breeders' Rights Act of 2014 (RGZ)
7. The Environmental Management Act, 2004
8. The National Biotechnology Policy, 2010
9. The National Environmental Policy, 2021
10. The Environmental Management (Biosafety) Regulations,2009 read together with the Environmental Management (Biosafety/Amendment)
11. Member of regional blocs: SADC, EAC, ASARECA, ARIPO
12. Member of international seed organization: ISTA, OECD, International Union for the Protection of New Varieties of Plants (UPOV) convention of 1991 that provides breeders of new plant varieties with an intellectual property protection

Long term vision, mission and goals

The United Republic of Tanzania has articulated its vision for the agriculture sector in several strategic documents, such as TDV 2025, ASDP II and Agenda 10/30. The country intends to grow the seed sector to support the agriculture sector expansion to assure food security, increase the value and productivity of agriculture, build resilient food systems, generate youth and women employment, address climate constraints and harness public and private sector investment in agriculture. Table 5 below illustrates the missions, visions and goals of the institutions involved in the seed sector.

Table 5: Long-term mission, vision and goals

Seed sector institutions, vision, mission and core objectives				
#	**Inst.**	**Vision**	**Mission**	**Goals/Objectives**
1	SCU	A modern, commercial, competitive and sustainable seed sector for enhanced nutrition, food security and livelihood improvement	To provide high quality support services to help the Ministry of Agriculture and sector stakeholders coordinate and plan for the seed sector, formulate policy, and provide reliable information about the sector to stakeholders, to create a sustainable enabling environment for seed sector investment and quality seed availability, accessibility, and utilization by farmers.	To be a trusted source of reliable information to seed stakeholders for planning and investment decisions. To create a conducive environment for promoting production and dissemination of quality seed for farming communities. SCU ESSETA strategic plan 2019
2	TARI	To be the Institute of excellence for agricultural research in the country and beyond	To generate and promote the application of knowledge, innovation and agricultural technologies as catalysts of change in achieving agricultural productivity, food and nutrition security, sustainable agriculture and economic growth involving stakeholders in the country and global community.	The Institute's mandate is to conduct, regulate, promote and coordinate all agricultural research activities conducted by public and private research institutes or organizations in Tanzania. To contribute to increased agricultural productivity through the development and deployment of improved agricultural knowledge and technologies by adopting an innovation systems approach. https://www.tari.go.tz/about-us/vision-mission--core-values
3	TOSCI	A farming community with quality seed and planting material for productivity and profitability	To control and enable seed quality through variety verification, seed and planting material certification and facilitate private and public sectors to produce and sell seed of high quality that meet international quality standards.	TOSCI is responsible for the certification and promotion of quality agricultural seeds produced and imported into the country for sale to safeguard farming communities from poor (fake) seeds from vendors of farm inputs. https://www.tosci.go.tz/pages/mission-and-vision
4	ASA	To be a leading sustainable producer and supplier of high-quality	To produce, process and market sufficient high quality agricultural seeds for the local and foreign markets. To ensure availability of high-quality seeds to Tanzanian farmers through strong collaboration with research and dedication of ASA resources.	Supply the necessary volume of quality Pre-basic and Basic seed required by private sector seed and other seed multipliers who produce certified seeds. Supply the necessary volume of quality Pre-basic and Basic seed required by private sector seed and other seed multipliers who produce certified seeds. Produce, market and distribute certified seed of crops and varieties for which private sector and other multipliers interest or ability is not strong enough to meet farmers demand. https://www.asa.go.tz/about-us/
5	TPHPA	People and environment safe from pesticides and sustainable agriculture	To empower farmers and the public to make informed decisions about pests, and pesticide management and provide information on plants and genetic resources for current and future development options.	Carry out phytosanitary inspections for seed and all plant materials, registration of pesticides and quality determinations, conservation of plant biodiversity, and toxicology. https://www.tphpa.go.tz/pages/mission-and-vission
6	SUA	To be a leading University in the provision of quality knowledge, skills in agriculture and allied sciences	"To Promote development in agriculture, natural resources and allied sectors through training, research and delivery of services.	Pursuit of excellence in service delivery Entrepreneurial and innovative spirit Competitive orientation Integrity, Transparency and Accountability Results/ Achievement oriented Diligence on duty Adaptive and responsive Freedom of thought and expression Gender sensitive Continuous learning https://www.sua.ac.tz/about-sua/history-and-facts/vision-mission-and-core-values

SITUATION ANALYSIS

This section provides a detailed analysis of the internal and external factors that influence the seed system and identifies key elements and conditions at national, regional, and/or global levels that may inform the choice of proposed strategic initiatives and the corresponding investment plan. This analysis also identifies internal strengths and weaknesses, external opportunities and challenges, enabling conditions, as well as potential future opportunities. Each of these elements has been assessed in connection with the key stakeholders and major institutional drivers that have an interest in or will be impacted by the proposed initiatives. The situation analysis ensures that the proposed strategy and investment plans stay focused on areas that add value to the ongoing efforts of strengthening the seed sector and enhancing agricultural productivity in Tanzania.

Internal strengths and weaknesses

Internal strengths and weaknesses in the country's seed systems as outlined in the relevant SeedSAT thematic areas, are presented in Table 6 and 7 below, respectively, in the order of importance.

Table 6: Internal strengths

Internal strengths	Relevant SeedSAT TA
1. **Existence of policy, legal and regulatory frameworks that support the agriculture and the seed sector.**	PLR
2. **Existence of vibrant seed sector.** The seed sector has been on an upward trajectory with production of certified seed of the 5 top common crops (maize, beans, paddy, sunflower, and wheat) increasing from 28,851 mt in 2019 to 37,871 mt in 2022 and the number of active seed producing companies increasing from 27 in 2014 to 51 in 2024. (See Annex 4 and Annex 5.)	QCSP, BVRM, EGS
3. **Existence of public and private institutions with clear mandate to focus on key seed activities.** These include TARI (development of improved crop varieties, production of breeder and pre-basic seed), ASA (production of basic and certified seed), TOSCI (certification and quality assurance), and TASTA (coordination of seed production entities' advocacy and dialogue needs).	BVRM, EGS, QA, QCSP, SMD
4. **Aligned government vision 2025 aimed at transforming Tanzania into a middle-income nation through quality agricultural seeds and material.** This document elevates seed as one of the key priority agriculture inputs for economic transformation (TOSCI ESSETA Strategic Plan, 2019). This is supported by Agenda 10/30 with a focus to increase productivity at farm level, and the draft Agricultural Master Plan 2050.	PLR, QCSP, SMD, FAP
5. **Strong and increasing government support to the agricultural input sector.** The government increased the agricultural budget nearly threefold to TZS 954 billion shillings in the FY 2022/23 budget from TZS 294 billion in the previous FY and plans to keep the budget elevated going forward. Other support includes strengthening extension services, expanding the national agricultural show, Nane Nane (e.g. in 2023, 30 foreign countries participated in Nane Nane), increasing focus on youth and women employment (Building a Better Tomorrow), increasing land under irrigation, and increasing seed and crop storage capacity.	ALL
6. **Government expansion of the definition of cash crops, to include high value exports such as maize and rice, and selecting 13 crops with potential export value for increased focus.** The 13 additional focus cash crops are: beans, maize, paddy, sunflower, wheat, cowpea, groundnut, sesame, sorghum, soya, barley, chickpea This expansion effort also includes the drive to strengthen access to foreign markets.	ALL
7. **Availability of 13 strategically located ASA seed farms in major agro-ecological zones of the country.** These farms facilitate easy access to seed production infrastructure by qualifying seed companies, and access to improved seeds by farmers.	BVRM, EGS, SMD
8. **Steady and substantial increase in export of non-traditional agricultural crops.** Export potential for non-traditional export crops is high. For example, maize commodity exports grew from 73,232 mt in 2020 to 400,115 mt in 2022; rice from 222,000 mt in 2020 to 351,000 mt in 2022 (DCD personal communication).	BVRM, EGS, QCSP, SMD
9. **Existence of Seed Coordination Unit (SCU) at the MoA.** The SCU is a focal/contact point for planning and coordination of seed-related matters within the Inputs Department at the MoA, and has recently received extensive training through ESSETA.	NPC
10. **Alignment of certification for public and private seed with international best practices (OECD and ISTA).** This facilitates international trade of quality seeds.	QA, SMD

Internal strengths	Relevant SeedSAT TA
11. **Existence of platforms for sharing seed related information.** For example, the Tanzania Agri-input Platform, TOSCI, ASA and Kilimo websites.	ALL
12. **Improved effectiveness and efficiency of seed quality assurance, which attracts additional seed company investment.** Availability of TOSCI's online Application System (TOAS) introduced in 2022 has proved to be a game-changer in enhancing certification efficiency and reduction of transaction cost of certification.	QA
13. **Government support for private sector players.** The government is pro-active about leveraging government assets such as land and infrastructure for efficient private sector use to expand commercial seed available to farmers.	QCSP, BVRM, EGS
14. **Complimentary government efforts such as reinstating the Planning Commission in Office of the President, and sector-wide Agriculture Master Plan 2050 being drafted.**	ALL

Table 7: Internal weaknesses

Internal weaknesses	Relevant SeedSAT TA
1. **Lack of a seed policy and strategy.** These would provide a road map and policy directives to increase production of quality seed in both the public and private sectors. A draft seed strategy is currently being developed through USAID funding.	All TAs
2. **Low varietal turnover.** This signifies old genetics among farmers. Of particular concern is the low use of hybrids in crops such as sunflower and sorghum, and even maize where the majority of planting material continues to be long term recycled seed. For sunflower, Record is the predominant variety, which is over 70 years old and has low oil content, thus not meeting market demand for higher oil content.	BVRM, QCSP, FAP
3. **Weakness within the SCU in terms of staffing levels and a broad mandate to support all inputs, in addition to the lack of a clear functional mandate for seed sector planning and coordination.** The current SCU team is insufficiently resourced, both financially and with personnel, to effectively execute the national planning and coordination role for the seed sector.	NPC
4. **Lack of low-cost financing to support private sector expansion, and government budget to carry out mandates.**	ALL
5. **Inadequate infrastructure.** Public and some private institutions lack adequate infrastructure to support quality seed production such as cold rooms, irrigation system, farm machinery, warehouses, laboratories and office supplies.	BVRM, QA, EGS
6. **Inadequate skilled personnel.** The organizations responsible for seed production, quality control, seed marketing and distribution lack enough skilled personnel (breeders, quality control experts, seed technologists, seed business managers, seed inspectors, data analysts, agrodealers).	BVRM, EGS, QA, QCSP, FAP, SMD
7. **Inadequate policy incentives to attract private sector investment in quality seed production.** Incentives include access to public land and infrastructure e.g. seed processors, irrigation, warehouses, cold storage; and other incentives such as tax breaks, reduced duty, etc.	QCSP, SMD
8. **Inadequate extension service.** This is mainly due to insufficient human, capital, and financial resources, although the Ministry has recently made major efforts to strengthen and support the existing extension service.	FAP, QCSP, SMD
9. **Lack of a centralized system for aggregating private sector EGS demand -** for government EGS production, planning to meet demand, and allocating EGS production to seed companies.	BVRM, EGS
10. **Limited knowledge and awareness among stakeholders on seed related matters** such as seed quality, and modern variety options.	FAP, QCSP, SMD
11. **Weak seed marketing and distribution system.** This is due in part to lack of well-functioning and proactive umbrella organization of agrodealers to coordinate seed business activities and advocate/lobby for a favorable seed business environment.	SMD, QCSP
12. **Challenge in data access.** Most data can only be accessed by authorized persons and not the general public. For example, the strategic plan for a public institution should be available to the public. In addition, seed-related data is housed in different institutions such Tanzania Bureau of Statistics, Tanzania Revenue Authority, Bank of Tanzania, and is sometimes overly consolidated.	NPC
13. **Current and proposed seed subsidies, if not efficiently and well managed, undercut private sector and/or supply substandard inputs.**	QCSP, FAP, SMD, NPC
14. **Degraded soils.** At least 61 percent of Tanzania's soils are estimated to be degraded, leading to loss in soil fertility, erosion, desertification, salinization and/or acidification (World Bank 2019c, URT 2018).	QCSP, FAP, SMD,
15. **Frequent turnover of senior leaders at the MoA.** When changes at top MoA and institutions happen, the understanding of seed system status, challenges and ongoing interventions is disrupted, negatively affecting continuity especially for policy matters.	NPC
16. **Political interference.** Interference from politics skew prioritization and seed availability of focus crops	ALL
17. **Lack of affordable commercial financing options to support both public and private sector investment in seed sector expansion**	BVRM, EGS, QCSP, SMD
18. **Over-reliance on donor funding**	ALL

External opportunities and threats

This section lists external opportunities (Table 8) and external challenges (Table 9) that are external to either the country and/or seed system, including the key stakeholders, in the order of importance as much as possible.

Table 8: External opportunities

External opportunities	Relevant SeedSAT TA
1. **Strong focus on agriculture.** Mainly agricultural country with high number of farmers, especially SHF (AASS data), and high area of arable land.	FAP, QCSP, SMD
2. **Political stability.**The country is largely peaceful with a conducive political environment, physical infrastructure, and climate to attract investment in the sector.	PLR, QCSP
3. **Availability of market intelligence data from relevant sources to inform external trade.**	NPC, QCSP, SMD
4. **Decreasing food imports into SSA,** especially of wheat from Russia and Ukraine to SSA countries, is an opportunity for local production to target these new markets.	NPC, QCSP, SMD
5. **Expansion and/or existence of regional trading blocs** (African Continental Free Trade Area - AfCFTA, Expanded EAC) harmonization of seed QA procedures in EAC, which is particularly important since Tanzania is a member of SADC while Kenya, Uganda, S. Sudan, etc. are members of COMESA.	ALL
6. **Large, active youth population** which can be employed in the sector, if it is made attractive to youth (e.g. Building a Better Tomorrow initiative).	QCSP, FAP, SMD
7. **Availability of ICT for agricultural information,** including widespread use of social media platforms.	FAP, QCSP, SMD
8. **Availability of advanced technologies for research and crop production, e.g.,** from CG centers	BVRM, EGS, QCSP

Table 9: External challenges

External challenges	Relevant SeedSAT TA
1. **Low purchasing power,** especially at smallholder farmer level	FAP, SMD
2. **Local currency depreciation** against major international currencies, especially USD	ALL
3. **Climate change**	ALL
4. **Development partners divesting from seed/agricultural sector funding** as more funding is directed to other sectors	QCSP, SMD, FAP
5. **Ongoing trade barriers,** including frequent export/import bans (e.g., Kenya, Malawi)	ALL
6. **Overdependence on rainfed agriculture,** both for seed and food production	ALL

Potential future trends to be considered

Table 10 below identifies potential future trends and risks with potential of impacting the seed sector and shaping seed regulations in the future.

Table 10: Potential future trends, including risks, to be considered

Potential future trends, including risks	
A.	Government seed subsidy for rice, wheat and sunflower
B.	New emerging technologies, including GMO
C.	Marker-assisted breeding – use of DNA markers associated with desirable traits to select a plant or animal for inclusion in a breeding program early in its development
D.	Genome editing for control of MLN
E.	Use of artificial Intelligence use (e.g. use of drones, robots) in seed production processes
F.	Outbreak of new diseases affecting crops and people
G.	Shift to climate smart technologies, e.g., focus on drought tolerant, early maturing varieties, employment of water efficient production approaches, and shift from rainfed to irrigation-based farming.

SECTOR SEGMENTATION

This section identifies and profiles all relevant segments of the seed sector. All the possible segments under the government seed mandate are included. The segments are profiled along the dimensions given below:

1. Customers (refers to groups who use government seed services and products, plus other stakeholders)
2. Crops
3. Seed type (refers to generations of seed, in addition to other types of planting material such as seedlings, tubers, etc.)
4. Geography

Customer segments

The users of government seed services and products include farmers, governmental and non-governmental organizations, and seed distributors, with smallholder farmers being the majority. (Table 11)

Table 11: Product and service user/customer segments

Product and service user/customer segments		
Segment name	**Description**	**Measure of size**
Smallholder farmers	Characterized by ≤ 10 ha farm size; use of hand hoe, use of oxen, and practice of mixed farming with low use of improved seed	Number of farmers 6,859,562 (80% of total farmers in Tanzania) Source: AASS
Medium-scale farmers	Farmers with farm size greater than 10 ha but less than 570 ha	Number of farmers 1,286,168 (15% of Total Farmers in Tanzania) Source: AASS
Large-scale farmers	Commercial farmers with a farm size greater than 570 ha, practicing mono-cropping farming system and fully mechanized	Number of farmers 428,723 (5% of Total farmers in Tanzania) Source: AASS
Seed Companies	These are local and foreign seed companies registered to produce/import/export/sell seeds	TOSCI has registered 218 seed companies, however, only 51 are said to be actively involved in seed production and distribution (20 local, 13 regional, 14 multinationals and 4 public)- TOSCI, TASTA
QDS producers	Farmers trained to produce Quality Declared Seeds and allowed to sell at their defined localities	Approximately 980 QDS fields registered annually - TOSCI
LGAs	Local Government Authorities (LGAs, in Districts) responsible for seed technology transfer to farmers in collaboration with Extension	Number of LGAs (184)
NGOs	Non-governmental organizations dealing with training farmers, agro-dealers and extension officers, and providing agricultural input loans to farmers	Number of NGOs engaging in agriculture in 2019 was estimated to be 184
Seed distributors/ stockists	Trained and registered seed distributors and sellers to farming communities	In 2020, TOSCI is said to have registered 7,189 agrodealers, up from 4,000 in 2016 (TASAI 2021)
TASTA	An association representing seed traders in the country.	Currently it comprises 51 members, both local and international seed companies

Crop segments

The volume of quality seed for each crop segment availability in 2023 and the number of seed entities licensed to produce the released varieties are presented in Table 12 below.

Table 12: Crop segments for focus crops

Crop segments		
Segment name	**Description**	**Measure of size**
Cereals (maize, paddy, sorghum, millet, wheat)	These are cereal crop varieties evaluated, registered and certified by TOSCI	Quality seed availability in 2023 in mt: Maize – 40,489, paddy – 828, wheat – 1,381, sorghum – 270 (total – 42,968) Number of seed entities licensed to produce released varieties (maize-27, paddy-6, wheat-3, sorghum-7)
Pulses (common beans, soybeans, pigeon pea, cowpea, green gram)	These are leguminous crop varieties under pulses evaluated, registered and certified by TOSCI	Quality seed availability in 2023 in mt: Bean - 180, soybean - 248, cowpea - 0.4 (total 428.4) Number of seed entities licensed to produce released varieties (17)
Oil seeds (Sunflower, sesame, groundnut)	These are crop varieties under oil crops evaluated, registered and certified by TOSCI	Quality seed availability in 2023 in mt: Sunflower – 1,535, sesame - 75, groundnut - 22 (total - 1632) Number of seed entities licensed to produce released varieties (12)

Seed type segments

Table 13 below identifies seed type segments and the respective measure of volumes certified by TOSCI.

Table 13: Seed type segments

Seed type segments		
Segment name	**Description**	**Measure of size**
Breeder seed	Seed of a new variety with highest purity, produced, developed, controlled and provided directly by the breeder or institution for further multiplication	In 2021, TOSCI certified a total of 36.3 mt of breeder seed of priority crops produced by TARI (maize: 2.07, beans: 7.84, paddy: 7.5, sunflower: 1.0 and wheat: 17.88)
Pre-basic seed	Certified early generation seed class produced by breeders from both public and private institutions	In 2021, TOSCI certified a total of 360.12 mt of basic seed of the top five priority crops produced by TARI (maize: 32.78, beans: 57.09, paddy: 116.29, sunflower: 14.75 and wheat: 196.3). Private seed companies with proprietary varieties produce their own pre-basic seed, which must also be certified.
Basic seed	Certified early generation class multiplied by ASA and private seed companies	In 2021, TOSCI certified a total of 43.72 mt of basic seed from ASA and a total of 130.33 mt by TARI Tonnage certified.
Locally produced and imported certified seeds	Certified C1 & C2 generations multiplied by ASA and Seed companies	Total certified seed in 2023 for 10 priority crops was 45,028 mt
Quality Declared Seeds (QDS)	QDS 1 and QDS 2 generations multiplied by smallholder farmers or groups of smallholder farmers. The producer declares the quality of seed and sells the seed in defined localities. TOSCI is responsible for limited quality assurance to verify quality	1,060 mt in 2022

Geographic segments

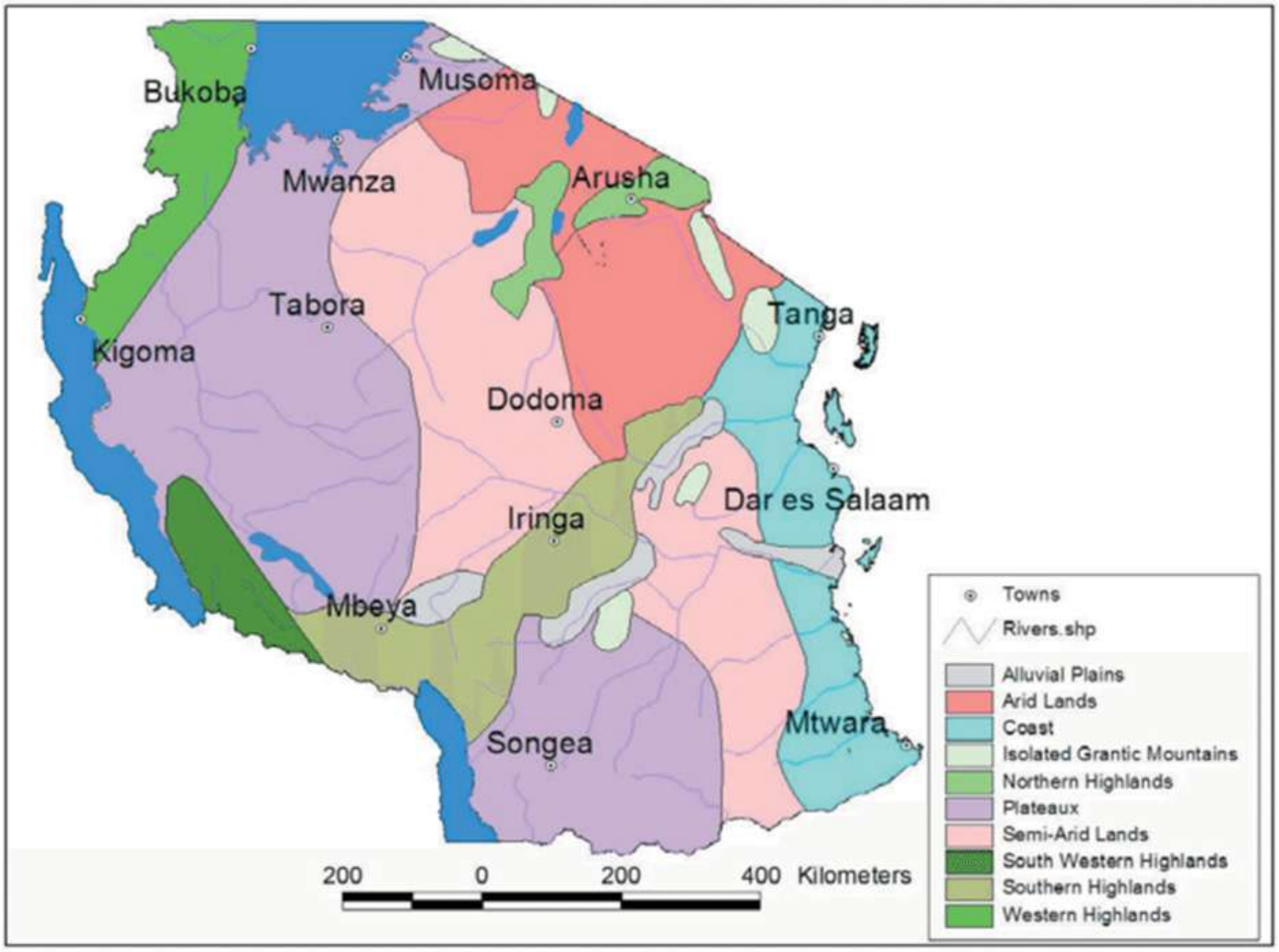
Tanzania has seven agroecological zones, each with its unique climate and soil. These seven agroecological zones support a wide variety of crops and play a vital role in the economy of Tanzania. Table 14 below identifies these agroecological zones, and Figure 7 presents a map of the zones.

Table 14: Geographic segments

Geographic segments		
Segment name	**Description**	**Measure of size**
Southern highland	Consists of the following regions: Iringa, Njombe, Songwe, Mbeya, Ruvuma, Rukwa, cultivating mainly maize, beans, paddy, round potato, tea and wheat	1,809,801 farmers and 3,630,000 ha cultivated.
Southern zone	Includes Mtwara, Lindi and Tunduru District mainly cultivating cashewnut, cassava, sesame, pigeon pea, and groundnut	1,243,406 farmers and 2,400,000 ha farmed
Central zone	Consists of the following regions: Dodoma, Tabora and Singida; cultivating sunflower, sorghum, millet, cowpea, groundnut and maize	1,450,547 farmers and 1,561,147 ha cultivated
Eastern zone	Consists of Morogoro, Dar es Salaam, Coast and mainly cultivates paddy, beans, cassava, coconut, sunflower, sweet potato, banana fruit and vegetables	855,729 farmers and 4,543,239 ha cultivated
Lake zone	Includes the following regions: Kagera, Mwanza, Geita, Shinyanga, Mara and Simiyu and mainly cultivates cotton, paddy, banana, maize, cassava, beans, and sorghum	2,384,712 farmers and 4,530,000 ha cultivated
Northern zone	Includes the following regions: Arusha, Manyara, Kilimanjaro and Tanga; cultivating banana, maize, beans, pigeon pea, fruit and vegetables	1,107,608 farmers and 2,180,000 ha cultivated
Western zone	Consists the following regions: Katavi and Kigoma; cultivating sorghum, maize, cassava, millet, paddy, palm oil, and beans	790,020 farmers and 705,000 ha cultivated

Source: AASS, 2019/20

Figure 7: Map showing Tanzania agroecological zones



The analysis of strengths, weaknesses, opportunities and challenges in the section above indicates that Tanzania's seed system is getting more and more competitive. This is evidenced by the long list of internal strengths and to a lesser extent, external opportunities. However, there are many gaps that need to be addressed, if the country is to achieve food security, youth and women employment, and become a net exporter of food crops, as per the government's vision.

The government has laid the groundwork for investments and improvements. The sector also has the critical number of players needed to expand. Strategic funding for prioritized gaps will accelerate the current growth trajectory, and also prevent shocks that may impede growth along the way. The country also needs to be very aware of policies that can cause deceleration of current growth in the sector, for example, interventions that may discourage private sector investment. The next section discusses the investments that can be considered to address the identified gaps.

PROPOSED STRATEGIC INITIATIVES

The proposed strategic initiatives that would significantly enhance and strengthen Tanzania's seed sector, and support achievement of the Government of Tanzania's vision, mission and goals for the seed and broader agriculture sectors are presented in Table 15 below.

Table 15: Proposed strategic initiatives

Strategic initiatives proposed	SeedSAT Thematic Area	Implementing partner	Beneficiary	Seed type
1.1. Upgrade infrastructure for variety development, maintenance breeding and EGS production Upgrade institutional facilities such as irrigation systems, cold rooms, processing facilities, warehouses, quality control and nutrition laboratories, seed dryers, and farm machinery at TARI Centers where substantive work on breeding and EGS seed production is undertaken. TARI Centers and ASA farms focusing on the first five priority crops will be considered first.	BVRM EGS	TARI	Seed companies QDS producers	EGS
1.2. Upgrade infrastructure for public EGS production Upgrade ASA warehouses and install seed dryers to support EGS production in two strategic farms which serve the highest number of private sector companies, and are important for wheat, sunflower and maize seed	EGS	ASA	Seed companies QDS producers	EGS
1.3. Upgrade infrastructure for seed quality assurance of both EGS and commercial seed Upgrade institutional facilities such as cold rooms, vehicles and quality control laboratories (buildings and equipment where applicable) at TOSCI regional laboratories that still need upgrades	QA EGS QCSP	TOSCI	Seed companies QDS producers Farmers	EGS, Certified seed
2. Support private sector to access facilities for quality seed production, processing and storage				
2.1.(a) Develop infrastructure-sharing mechanism with private sector to access public sector facilities for quality seed production, processing and storage Develop a transparent mechanism for accessing public sector facilities such as land, irrigation, warehousing and seed processing facilities	QCSP	TARI	Seed companies QDS producers	EGS, Certified seed
2.1. (b) Develop infrastructure-sharing mechanism with private sector to access public sector facilities for quality seed production, processing and storage Develop a transparent mechanism for accessing public sector facilities such as land, irrigation, warehousing and seed processing facilities	QCSP	ASA	Seed companies QDS producers	EGS, Certified seed
2.2. Develop legal process and guidelines for licensing publicly-bred varieties to private seed companies, including mechanism for sharing information on available varieties, ordering and generating invoices for royalty payments	BVRM QCSP	TARI	Seed companies	EGS, Certified seed
2.3. Provide incentives to private sector to increase quality seed production Provide financial and tax incentives to private sector seed producers to enable them improve seed production, processing and storage infrastructure. This is especially important because TOSCI's authorization of private seed certification will require seed companies to improve their seed quality control infrastructure. Incentives could include low interest borrowing rates, matching grants, lease-to-own facilities, tax incentives, etc.	QCSP	TASTA	Agrodealers Farmers	Certified seed
2.4. Provide incentives to private sector seed distributors to increase quality seed distribution Provide financial and tax incentives to private sector seed distributors to enable them to improve the efficiency of seed distribution, storage infrastructure and marketing. These could include low interest borrowing rates, matching grants, lease-to-own facilities, tax incentives, etc.	SMD	TOSCI	Agrodealers Farmers	Certified seed

Strategic initiatives proposed	SeedSAT Thematic Area	Implementing partner	Beneficiary	Seed type
2.5. Provide linkages to affordable financing Link agrodealers and seed companies to affordable financial options available in the market with flexible repayment plans as well as low interests to encourage investment in the seed production and distribution. This may include developing/updating relevant online platforms of available sector financiers, sharing information on available funding programs periodically, etc.	SMD QCSP	TASTA	Farmers	Certified seed
3. Strengthen specialized public-sector institutional capacity				
3.1. Build capacity for public-sector breeding and EGS production Provide tailor-made capacity building in modern breeding methods and line maintenance to plant breeders, technicians, and seed technologists	BVRM EGS	TARI	Seed companies QDS Producers	EGS
3.2. Build capacity for public-sector EGS production Provide tailor-made capacity building in modern breeding methods and line maintenance to plant breeders, technicians, and seed technologists	EGS	ASA	Seed companies QDS Producers	EGS
3.3. Develop a farm management system to enhance EGS production Develop or source for an appropriate farm management tool to enhance operations of ASA farms, including for EGS production	EGS	ASA	Seed companies QDS Producers	EGS
3.4. Build capacity for regulatory seed quality assurance Provide tailor-made capacity building in seed quality control including field inspections and laboratory testing for public and private inspectors and analysts	QA QCSP	TOSCI	Seed companies Farmers	EGS, Certified seed
3.5. Build capacity of plant breeders on regulatory requirements for variety release and registration TOSCI will provide training to plant breeders in both public and private sector for them to fully understand the requirements, including the data that need to be submitted, for release of newly development varieties	BVRM	TOSCI	Seed companies QDS producers Farmers Agrodealers	EGS
3.6. Build capacity for extension workers to carry out QA seed activities Provide tailor-made courses for public and private sector extension workers to train agrodealers and farmers on seed quality, correct seed placement based on agroecological zones, through carrying out of joint demonstration plots and field days	FAP SMD QCSP	MoA Extension	Farmers Agrodealers	Certified seed
4. Strengthen specialized private-sector human resource capacity for seed production and marketing				
4.1. Build capacity for seed production, processing and storage Provide tailor-made capacity building in maintenance of lines, seed quality control, seed production, processing and storage; data/knowledge management and business skills to key seed experts including seed company breeders and technicians, private seed inspectors and seed company production staff	EGS QCSP	TASTA	Farmers Seed companies	EGS, Certified seed
4.2. Provide capacity building to agrodealer sales teams on seed marketing and distribution, and provide platforms for creating linkages between seed companies and agrodealers to carry out promotions through demos and field days	QCSP SMD FAP	TANADA	Farmers	Certified seed, QDS
5. Increase decentralization of seed quality control services and strengthen TOSCI oversight				
5.1. Support continuation of TOSCI's decentralization of quality control services Support decentralization of seed quality control through training, licensing, audits and oversight of Authorized Seed Inspectors (ASIs), samplers, analysts, seed producing entities and laboratories, for increased efficiency of seed certification services	QA QCSP	TOSCI	Seed companies QDS producers Farmers	Certified seed
5.2. Provide computer equipment and hand-held field inspection tools to increase efficiency Supply TOSCI inspectors with hand-held tools for field inspection, and modify TOAS to support uploading of information obtained by the hand-held tools	QA QCSP	TOSCI	Seed companies QDS producers	Certified seed
5.3. Strengthen TOSCI field monitoring and surveillance activities Support TOSCI efforts to identify low quality by carrying out extensive warehouse inspections and post-control activities	QA QCSP SMD	TOSCI	Farmers	Certified seed

Strategic initiatives proposed	SeedSAT Thematic Area	Implementing partner	Beneficiary	Seed type
5.4. Develop national guidelines for variety testing and evaluation as a tool for both plant breeders and TOSCI	BVRM	TOSCI	Plant Breeders TOSCI Seed companies	EGS, Certified seed
5.5. Develop a farmer-friendly online database of commercialized seed varieties that will help farmers, agrodealers and extension workers select suitable seed of crop varieties for their geographical location and agroecology Develop a tool that will assist farmers, agrodealers and extension workers access useful, accurate and timely information on available seed of varieties that are suitable for their geographical location, agroecology and also targeted to their specific interests, such as early maturity or drought tolerance.	FAP SMD QCSP	TOSCI	Farmers Extension workers Agrodealers	Certified seed
6. Increase access to quality EGS through genetic purification, and making varietal information and EGS requirements available				
6.1 Facilitate purification of old, popular, public varieties' parental material for quality EGS production Support the process of developing purification protocols, and purifying selected viable older varieties to ensure that the EGS produced is genetically sound	BVRM EGS	TARI	Seed companies ASA QDS producers	EGS
6.2. (a) Develop and formalize the process for aggregating private sector needs for government EGS production, planning to meet demand, and allocating EGS seed produced at TARI to seed companies Develop forecasting aggregation, transparent ordering and allocation processes for government produced EGS for the private sector	BVRM EGS	TARI	Seed companies QDS producers	EGS
6.2. (b) Develop and formalize the process for aggregating private sector needs for government EGS production, planning to meet demand, and allocating EGS seed produced at ASA to seed companies Develop forecasting aggregation, transparent ordering and allocation processes for government produced EGS for the private sector	EGS	ASA	Seed companies QDS producers	EGS
6.3. Develop an information-sharing platform on varietal traits, release and access Develop a platform for variety information and availability, with ordering mechanism to enable private sector make requests to public breeding centers	BVRM EGS	TARI	Seed companies QDS producers	Certified seed, QDS
7. Strengthen the Seed Coordination Unit at the Ministry of Agriculture				
7.1. Strengthen the SCU capacity to carry out its mandate for overall seed sector planning and coordination Review current SCU structure, propose and implement activities to formalize SCU mandate to carry out apex seed planning and coordination activities at MoA	NPC PLR	SCU	Seed companies Agrodealers QDS producers Farmers	All seed classes
7.2. Strengthen the SCU capacity to assemble, analyze and share all seed related information including seed demand and seed availability Support data gathering, cleaning, analysis and sharing capability of the SCU, and provide appropriate tools, platforms and forums for sharing information	NPC	SCU	Seed companies QDS producing Farmers Agrodealers	All seed classes
7.3. Support the SCU to carry out seed sector activities required by law Provide the necessary technical, human and financial resources required to carry out seed sector activities required by law including organizing the National Variety Release Committee meeting and National Seed Committee meeting, updating the national variety catalogue and facilitating development of agricultural seed policy knowledge in specific areas, to be able to effectively carry out this function	NPC	SCU	Seed companies QDS Producers Farmers Agrodealers	All seed classes
7.4. Develop strategies for communication and coordination between MoA and other partners, including organizing seed stakeholder meetings at regular, pre-agreed intervals	NPC	SCU	Seed companies QDS producers Farmers Agrodealers	All seed classes

Strategic initiatives proposed	SeedSAT Thematic Area	Implementing partner	Beneficiary	Seed type
8. Create awareness for farmers about quality seed				
8.1. Tailor-make and offer seed quality training modules for both public and private extension officers to ensure the right information is disseminated to farmers Train both public and private extension workers on good quality seed, proper seed quality maintenance and positioning, identification of fake and low-quality seed, and good agronomic practices that guarantee optimal performance of quality assured seed	SMD FAP QCSP	MoA Extension	Farmers Agrodealers	Certified seed
8.2. Develop a mechanism for farmers to report back on fake or low-quality seed Develop online platforms that engender confidentiality in reporting on low quality and counterfeit seed, and encourage use of sticker labels	SMD FAP QA	TOSCI	Farmers Agrodealers	Certified seed
8.3. Raise farmer awareness through farmer field school-type activities Carry out farmer awareness activities including setting up farmer field schools, participation in fairs, Nane Nane shows, use of promotional materials, sms blasts	FAP	MoA Extension	Farmers Agrodealers	Certified seed
9. Strengthen national and regional agrodealer associations				
9.1. National Agrodealer Mapping Exercise Carry out national agrodealer mapping exercise to understand and improve agrodealer coverage and performance	SMD	TANADA	Agrodealer Associations Seed companies Farmers	Certified seed
9.2. Increase agrodealer coverage Support agrodealers' development in regions with scanty distribution of agrodealers through recruitment, training and providing linkages to relevant agrodealer-support groups	SMD	TANADA	Seed companies Farmers	Certified seed
9.3. Establish Agrodealer Associations Support agrodealer networking and establishment or strengthening of national/regional associations to enhance self-regulation and improve services to farmers and advocacy	SMD	TANADA	Agrodealer Associations Seed companies Farmers	Certified seed
9.4. Support Agrodealer networking and develop linkages Support agrodealer networking among each other and develop linkages with suppliers of seed, fertilizer, agrochemicals, equipment etc) and national agricultural activities such as Nane-Nane	SMD	TANADA	Agrodealer Associations Seed companies Farmers	Certified seed
10. Strengthen the Tanzania Seed Trade Association				
10.1. Support TASTA to develop a strong understanding of policy and legal issues affecting the seed industry, and strengthen TASTA's ability to effectively represent private seed company interests, particularly its ability to advocate for necessary changes in legislation	QCSP	TASTA	Seed companies	Certified seed
10.2. Support TASTA to offer linkages with the wider seed sector for purposes of sharing new knowledge and skills, and discussing arising challenges among both public and private industry stakeholders. This will include hosting periodic well-planned stakeholder gatherings, at least twice a year	QCSP	TASTA	Seed companies	Certified seed
10.3. Strengthen TASTA staff capacity to be able to run a sound association, through capacity-building for governance; and financial, administrative and Human Resource systems and processes	QCSP	TASTA	Seed companies	Certified seed
11. Merge seed certification and seed phytosanitary control services				
11.1. Initiate legal process to merge TPHPA seed phytosanitary services into TOSCI seed quality control services TOSCI is responsible for the certification and control of quality agricultural seed both locally produced and imported. TPHPA is responsible for all phytosanitary health for both seed and commodity crops. It is a challenge on the seed part as the certification process has to be handled by both institutions. The optimal situation is to have all seed services, including phytosanitary aspects, under the mandate of TOSCI. This will improve both the effectiveness and efficiency of the service delivery.	QA BVRM EGS QCSP PLR	TOSCI	Seed companies Farmers	EGS, Certified seed

Note: The focus crops are the 13 identified by MoA for food security, with emphasis on maize, paddy, beans, sunflower and wheat. The geographic focus is national, but with specific emphasis on regions producing the focus crops.

RECOMMENDED INVESTMENTS

This section includes recommended investments and the costing plan. It lists the strategic initiatives recommended in the previous section and provides a brief description of cost elements, estimated costs, and the designated responsible institutions.

Table 16: Costing by strategic initiative

Initiative/Activity description	SeedSAT Thematic Area	Institution Responsible	Initiative Cost
1. Upgrade public-sector infrastructure to assure high-quality seed production			
1.1. Upgrade infrastructure for variety development, maintenance breeding and EGS production	BVRM, EGS	TARI	$ 4,655,600
1.2. Upgrade infrastructure for public EGS production	EGS	ASA	$ 1,650,000
1.3. Upgrade infrastructure for seed quality assurance of both EGS and commercial seed	QA, EGS, QCSP	TOSCI	$ 3,414,000
Sub-total Cost			**$ 9,719,600**
2. Support private sector to access facilities for quality seed production, processing and storage			
2.1. (a) Develop infrastructure-sharing mechanism with private sector to access public sector facilities for quality seed production, processing and storage	QCSP	TARI	$ 80,500
2.1. (b) Develop infrastructure-sharing mechanism with private sector to access public sector facilities for quality seed production, processing and storage	QCSP	ASA	$ 80,500
2.2 Develop legal process and guidelines for licensing publicly-bred varieties to private seed companies	BVRM QCSP	TARI	$ 75,500
2.3. Provide incentives to private sector to increase quality seed production	QCSP		-
2.4. Provide incentives to private sector seed distributors to increase quality seed distribution	SMD		-
2.5. Provide linkages to affordable financing	SMD, QCSP		-
Sub-total Cost			**$ 236,500**
3. Strengthen specialized public-sector institutional capacity			
3.1. Build capacity for public-sector breeding and EGS production	BVRM, EGS	TARI	$ 86,200
3.2. Build capacity for public-sector EGS production	EGS	ASA	$ 166,500
3.3. Develop a farm management system to enhance EGS production	EGS	ASA	$ 176,400
3.4. Build capacity for regulatory seed quality assurance	QA, QCSP	TOSCI	$ 204,000
3.5. Build capacity of plant breeders on regulatory requirements for variety release and registration	BVRM	TOSCI	$ 24,000
3.6. Build capacity for extension workers to carry out QA seed activities	FAP, SMD, QCSP	MoA Extension	$ 885,000
Sub-total Cost			**$ 1,542,100**
4. Strengthen specialized private-sector human resource capacity for seed production and marketing			
4.1. Build capacity for seed production, processing, and storage	EGS, QCSP	TASTA	$ 285,500
4.2. Provide capacity building to agrodealer sales teams on seed marketing and distribution	QCSP, SMD, FAP	TANADA	$ 483,750
Sub-total Cost			**$ 769,250**
5. Increase decentralization of seed quality control services and strengthen TOSCI oversight			
5.1. Support continuation of TOSCI's decentralization of quality control services	QA, QCSP		$ 479,500
5.2. Provide computer equipment and hand-held field inspection tools to increase efficiency	QA, QCSP		$ 74,000
5.3. Strengthen TOSCI field monitoring and surveillance activities			$ 650,000

Initiative/Activity description	SeedSAT Thematic Area	Institution Responsible	Initiative Cost
5.4. Develop national guidelines for variety testing and evaluation as a tool for both plant breeders and TOSCI			$ 303,300
5.5. Develop a farmer-friendly online database of commercialized seed varieties that will help farmers, agrodealers and extension workers select suitable seed varieties for their geographical location and agroecology			$ 83,010
Sub-total Cost			**$ 1,589,810**
6. Increase access to quality EGS through genetic purification, and making varietal information and EGS requirements available			
6.1 Facilitate purification of old, popular, public varieties' parental material for quality EGS production	BVRM, EGS	TARI	$ 114,720
6.2. (a) Develop and formalize process for aggregating private sector needs for government EGS production, planning to meet demand, and allocating EGS seed produced at TARI to seed companies	BVRM, EGS	TARI	$ 145,700
6.2. (b) Develop and formalize process for aggregating private sector needs for government EGS production, planning to meet demand, and allocating EGS seed produced at ASA to seed companies	EGS	ASA	$ 145,700
6.3. Develop an information-sharing platform on varietal traits, release and access	BVRM, EGS	TARI	$ 65,900
Sub-total Cost			**$ 472,020**
7. Strengthen the Seed Coordination Unit at the Ministry of Agriculture			
7.1. Strengthen the SCU capacity to carry out its mandate for overall seed sector planning and coordination	NPC, PLR	SCU	$ 154,780
7.2. Strengthen the SCU capacity to assemble, analyze and share all seed related information including seed demand and seed availability	NPC	SCU	$ 456,700
7.3. Support the SCU to carry out seed sector activities required by law	NPC	SCU	$ 254,950
7.4. Develop strategies for communication and coordination between MoA and other partners	NPC	SCU	$ 166,900
Sub-total Cost			**$ 1,033,330**
8. Create awareness for farmers about quality seed			
8.1. Tailor-make and offer seed quality training modules for both public and private extension officers to ensure the right information is disseminated to farmers	SMD, FAP, QCSP	MoA Extension	$ 471,150
8.2. Develop a mechanism for farmers to report back on fake or low-quality seed	SMD, FAP, QA	TOSCI	$ 481,700
8.3. Raise farmer awareness through farmer field-school type activities	FAP	MoA Extension	$ 431,700
Sub-total Cost			**$ 1,384,550**
9. Strengthen national and regional agrodealer associations			
9.1. National Agrodealer Mapping Exercise	SMD	TANADA	$ 90,310
9.2. Increase agrodealer coverage	SMD	TANADA	$ 460,000
9.3. Establish Agrodealer Associations	SMD	TANADA	$ 335,800
9.4. Support Agrodealer networking and develop linkages	SMD	TANADA	$ 379,000
Sub-total Cost			**$ 1,265,110**
10. Strengthen the Tanzania Seed Trade Association			
10.1. Support TASTA to develop a strong understanding of policy and legal issues affecting the seed industry, and strengthen TASTA's ability to effectively represent private seed company interests, particularly its ability to advocate for necessary changes in legislation	QCSP	TASTA	$ 154,000
10.2. Support TASTA to offer linkages with the wider seed sector for purposes of sharing new knowledge and skills, and discussing arising challenges among both public and private industry stakeholders. This will include hosting periodic well-planned stakeholder gatherings, at least twice a year	QCSP	TASTA	$ 405,050
10.3. Strengthen TASTA staff capacity to be able to run a sound association, through capacity-building for governance; and financial, administrative and Human Resource systems and processes	QCSP	TASTA	$ 277,520
Sub-total Cost			**$ 836,570**

Initiative/Activity description	SeedSAT Thematic Area	Institution Responsible	Initiative Cost
10. Strengthen the Tanzania Seed Trade Association			
10.1. Support TASTA to develop a strong understanding of policy and legal issues affecting the seed industry, and strengthen TASTA's ability to effectively represent private seed company interests, particularly its ability to advocate for necessary changes in legislation	QCSP	TASTA	$ 154,000
10.2. Support TASTA to offer linkages with the wider seed sector for purposes of sharing new knowledge and skills, and discussing arising challenges among both public and private industry stakeholders. This will include hosting periodic well-planned stakeholder gatherings, at least twice a year	QCSP	TASTA	$ 405,050
10.3. Strengthen TASTA staff capacity to be able to run a sound association, through capacity-building for governance; and financial, administrative and Human Resource systems and processes	QCSP	TASTA	$ 277,520
Sub-total Cost			**$ 836,570**
11. Merge seed certification and seed phytosanitary control services			
11.1. Initiate legal process to merge TPHPA seed phytosanitary services into TOSCI seed quality control services	QA, BVRM, EGS, QCSP, PLR	TOSCI	126,000
Sub-total Cost			**$ 126,000**
Total Cost			**$ 18,974,840**

Table 17: Costing by partner institution

Institution and Initiative	Cost ($)	Short-term (12-24 mths)	Priority
TARI			
1. Upgrade infrastructure for variety development, maintenance breeding, EGS production	4,655,600		
2. Develop infrastructure-sharing mechanism with private sector to access public sector facilities for quality seed production, processing and storage	80,500	Y	
3. Develop legal process and guidelines for licensing publicly-bred varieties to private seed companies	75,500		Y
4. Build capacity for public-sector breeding and EGS production	86,200		
5. Facilitate purification of old, popular, public varieties' parental material for quality EGS production	114,720		Y
6. Develop and formalize process of aggregating private sector needs for government EGS production, planning to meet demand, and allocating EGS seed produced at TARI to seed companies	145,700	Y	Y
7. Develop an information-sharing platform on varietal traits, release and access	65,900	Y	
Sub-total TARI	**5,224,120**		
ASA			
1. Upgrade infrastructure for public EGS production	1,650,000		
2. Develop infrastructure-sharing mechanism with private sector to access public sector facilities for quality seed production, processing and storage	80,500		Y
3. Build capacity for public-sector EGS production	166,500	Y	
4. Develop a farm management system to enhance EGS production	176,400	Y	Y
5. Develop and formalize process of aggregating private sector needs for government EGS production, planning to meet demand, and allocating EGS seed produced at ASA to seed companies	145,700	Y	
Sub-total ASA	**2,219,100**		
TOSCI			
1. Upgrade infrastructure for seed quality assurance of both EGS and commercial seed	3,414,000		
2. Build capacity for regulatory seed quality assurance	204,000	Y	
3. Build capacity of plant breeders on regulatory requirements for variety release and registration	24,000	Y	

Institution and Initiative	Cost ($)	Short-term (12-24 mths)	Priority
4. Support the continuation of TOSCI's decentralization of quality control services	479,500	Y	Y
5. Provide computer equipment and hand-held field inspection tools to increase efficiency	74,000	Y	Y
6. Strengthen TOSCI field monitoring and surveillance activities	650,000		
7. Develop national guidelines for variety testing and evaluation as a tool for both plant breeders and TOSCI	303,300	Y	
8. Develop a farmer-friendly online database of commercialized seed varieties	83,010	Y	
9. Develop a mechanism for farmers to report back on fake or low-quality seed	481,700	Y	Y
10. Initiate legal process to merge TPHPA seed phytosanitary services into TOSCI seed quality control services	126,000		
Sub-total TOSCI	**5,839,510**		
SCU			
1. Strengthen SCU capacity to carry out its mandate for overall seed sector planning and coordination	154,780		Y
2. Strengthen SCU capacity to assemble, analyze and share all seed information including demand and availability	456,700		Y
3. Support SCU to carry out seed sector activities required by law	254,950		
4. Develop strategies for communication and coordination between MoA and other partners	166,900	Y	
Sub-total SCU	**1,033,330**		
TASTA			
1. Build capacity for seed production, processing and storage	285,500		
2. Support TASTA to develop strong understanding of policy and legal issues, and strengthen TASTA's ability to effectively represent private seed company interests, particularly its ability to advocate for necessary changes in legislation	154,000		Y
3. Support TASTA to offer linkages for purposes of sharing new knowledge and skills, ad discussing arising challenges among both public and private industry stakeholders, and hosting well-planned stakeholder gatherings, twice a year	405,050		
4. Strengthen TASTA staff capacity to be able to run a sound association, through capacity-building for governance; and financial, administrative and Human Resource systems and processes	277,520	Y	
Sub-total TASTA	**1,122,070**		
TANADA			
1. Provide capacity building to agrodealer sales teams on seed marketing and distribution	483,750		
2. National Agrodealer Mapping Exercise	90,310	Y	Y
3. Increase agrodealer coverage	460,000		
4. Establish Agrodealer Associations	335,800		Y
5. Support Agrodealer networking and develop linkages	379,000		
Sub-total TANADA	**1,748,860**		
MoA EXTENSION			
1. Build capacity for extension workers to carry out QA seed activities	885,000		Y
2. Tailor-make and offer seed quality training modules for both public and private extension officers to ensure the right information is disseminated to farmers	471,150	Y	
3. Raise farmer awareness through farmer field-school type activities	431,700		
Sub-total MoA Extension	**1,787,850**		
Total Cost	**18,974,850**		

IN CONCLUSION

The Seed Sector Investment Plan provides succinct guidance on where investments should be considered along the seed systems value chain, using the AGRA thematic areas. While investments in infrastructure tend to be expensive, the focus on having adapted varieties and to be able to produce sufficient quality EGS in a timely manner will yield results for other activities down the value chain, such as quality seed production and marketing. Hence, because of approaching the development of the investment plan from a systemic angle, gains in different sectors will most likely have a ripple effect in other seed-related sectors.

It is important to ensure that investments are actually utilized (and do not just sit on the shelf), by ensuring due diligence on actual needs and the existence of a supporting environment is done, especially of capital-intensive items such as cold storage facilities and irrigation, among others. Oftentimes donors will fund purchase of expensive items for which either the power supply cannot sustain, or there is little capacity to operate the equipment, among other numerous challenges. All these considerations need to be carefully accounted for before making any capital investment.

The other important part covered in this investment plan is capacity building at various levels, for all stakeholders. For capacity building to truly yield results that stick, it is important to use subject matter experts who are very practical and under the complexity of seed systems. Many times, the training offered is very academic and theoretical, which takes a long time and is not really suitable for professionals who are very busy and need the next level of coaching to enhance their work. It is be noted that AGRA, as part of CESSA, has started the process of supporting digital learning for several disciplines related to seed, such as business, finance, and marketing-related courses for seed companies and agrodealers, line maintenance training for NARS technicians, training on strengthening the running of seed and agrodealer associations among others, and AGRA's digital learning would be a good linkage and resource to tap into.

Finally, the intention of the investment plan is for the government to incorporate the initiatives into its annual planning process. This document will be even more useful if shared with prospective funders to guide their support.

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ANNEX 2

IDENTIFIED GAPS IN TANZANIA SEED SECTOR FROM SEEDSAT REPORTS

Thematic Area	Gaps
i. Breeding, variety release and maintenance	1. Inadequate funding for research breeding leading to inadequate facilities such as cold rooms, farm machineries, warehouses, laboratories, irrigation systems, gene bank of active germplasm and its operational plan etc. In most cases, there is no infrastructure, and the few available are obsolete and non-functional. 2. Poor facility in data capture and processing, inappropriate breeding/selection methods (not capitalizing on breeder's equation and limited resources do not allow larger trialing programs. 3. No reliable communication on seed production between public and private sector. 4. No consistent funding from government for breeding and variety maintenance. 5. No established mechanism for the collection of royalties in practice and no mechanism for the royalties to be ploughed back into research.
ii. Early generation seed	1. Inadequate maintenance of parental lines expertise, in most cases there is no succession plan of human resources. 2. No guaranteed pre ordering of EGS by seed producers. 3. No centralized system of knowing demand for EGS.
iii. Quality assurance	1. Fake and low-quality seed: Whereas TOSCI has put in place some measures meant to address the prevalence of counterfeit and low-quality seed in the market, a lot more need to be done to sensitize farmers on the use of scratch card labels, enhance TOSCI surveillance capacity and creation of awareness. Need for support for TOSCI to proactively combat low quality and counterfeit seed in the market and manage farmers-recycling of OPVs and use of quality declared seed (QDS). Low quality breeder and basic seed from TARI and ASA remains a challenge. 2. Inadequate knowledge in seed production and distribution: Past training offered by TOSCI, TARI, SUA and ASA have been limited in scope and reach. There is need to conduct regular and enhanced training programs meant to enhance the capacity of seed producers and distributors to increase efficiency in seed production. 3. Lack of enough seed inspectors, analysts and samplers: There is need to support TOSCI to enhance its personnel in seed inspection. Need to support roll-out of private seed company self-authorization. 4. Lack of coordination between seed inspection and phytosanitary services: Explore avenues for stronger and more effective coordination between TOSCI and TPHPA, and if need be, suggest policy review for merger. Need to identify pathways to closer collaboration between TOSCI and TPHPA and support implementation efforts. 5. Lack of enough, well-equipped laboratories for increased efficiency in seed inspection and cost: There is need to support upgrading of established labs and build new ones across the regions. 6. Lack of proper pre- and post-control mechanisms to manage seed quality in the market leading to lethargy on adoption of certified seed. Farmers do not relate certified seed to good quality and cost.
iv. Quality commercial seed production	1. Inadequate policies: Lack of proper policies and guidelines in support of private seed producers to access and use public land and other related infrastructures (irrigation, warehouses, driers etc.) for seed production. 2. Lack of affordable financing for the seed sector to enhance investment: There is need to explore innovative financing solutions (both public and private) to support private sector investment in seed sector expansion. 3. TASTA lacks financial resources to independently implement its core mandates as outlined in its strategic plan 2022 – 2026. 4. Most seed producers lack the technical know-how in business management, quality control, marketing and sales. 5. Low adoption of newly released varieties: Seed producers lack capital to invest in the production and marketing of new varieties, often with desirable attributes, leading to continued use of old, low yielding and vulnerable varieties. 6. TOSCI need to incorporate seed companies in the self-authorization program to provide seamless adoption.

v. National planning and coordination	1. Inadequate capacity of Seed Coordinating Unit: SCU lacks adequate personnel and resources to carry out its functions relating to planning and coordinating various seed sector players. There may be a need to overhaul SCU to include other stakeholders in both public and private seed sector. 2. There is no formal public sector mechanism for sector coordination. The current SCU team does not have a formal organizational structure. There is also no clear and explicit mandate to execute national planning and coordination roles. 3. SCU is insufficiently resourced, both financially and human resources, to ensure alignment with the mandate and vision of seed sector planning and coordination. 4. There does not appear to be formal inter-ministry coordination regarding seed with other ministries.
vi. Farmer awareness and participation	1. Inadequate extension services: Inadequacy in personnel and distribution and lack of technical know-how in seed-related matters and poor distribution. The extension services, both public and private, lacks proper coordination. Inadequate involvement of women and youth in extension makes extension ineffective. 2. Inadequate capacity of extension personnel and farmers on variety options, seed quality, farmers' rights and responsibilities concerning seed quality. 3. Lack of proper farmer feedback during research and after release of new varieties.
vii. Policy legal and regulatory	1. Lack of seed policy: No roadmap for improvement of agricultural productivity through use of certified high-quality seed by farmers. 2. Weak institutional capacity of seed regulatory authorities to implement their functions adequately; lack of modern facilities/equipment to meet stakeholders' demand and expectations.
viii. Seed marketing and distribution	1. Tanzania lacks well-functioning and proactive private sector associations of agrodealers. Initial plans to have regional and district-based associations did not take root leading to the collapse of the Tanzania National Agrodealers Association (TANADA). 2. Lack of training of agrodealers in seed and general business entrepreneurship. 3. Lack of agrodealers surveys and mappings to understand industry status and dynamics and establish new agrodealers. 4. Lack of agrodealer participation in the fight against counterfeit and general promotion of new varieties.

ANNEX 3

TARI CENTERS AND RESPECTIVE CROP MANDATES

#	Centre/sub-center	Mandates
1	TARI Uyole (Mbeya)	Beans, Maize, Irish Potato, Pyrethrum, Agro-mechanization
2	TARI Kifyulilo (Mufindi, Iringa)	Beans, Irish Potato
3	TARI Ukiriguru (Mwanza)	Cotton, Roots, and Tubers
4	TARI Maruku (Kagera)	Banana
5	TARI Selian (Arusha)	Wheat, Barley and Maize
6	TARI Tengeru (Arusha)	Vegetables, Spices and Fruits
7	TARI Naliendele Mtwara)	Cashew, Groundnuts and Sesame
8	TARI Ilonga (Kilosa, Morogoro)	Maize, Grain Legumes, Sunflower, Sorghum & Millets; and Post-Harvest Management.
9	TARI Dakawa Mvomero, Morogoro)	Rice, Maize (Low & medium attitude); vegetables
10	TARI Ifakara (Morogoro	Rice
11	TARI Tumbi (Tabora)	Agroforestry
12	TARI Mlingano (Tanga)	Soil and Sisal
13	TARI Kibaha (Pwani)	Sugarcane
14	TARI Mikocheni (Dar es Salaam)	Coconut, Biotechnology
15	TARI Hombolo (Dodoma)	Sorghum and millets
16	TARI Makutupora (Dodoma)	Grapes
17	TARI Kihinga (Kigoma)	Oil palm

ANNEX 4

LIST OF ACTIVE SEED COMPANIES IN TANZANIA IN 2024

#	Seed company	Location of HQs	Category
1	Agriseed Technologies Ltd	Morogoro	Local
2	Aminata Quality Seeds & Consultant Ltd	Tanga	Local
3	Beula Seeds Ltd.	Arusha	Local
4	Bora Agro Seed Co. Ltd	Arusha	Local
5	Highland Seed Growers Ltd	Mbeya	Local
6	IFFA Seeds Ltd	Arusha	Local
7	Krishna Seeds Ltd	Babati	Local
8	Mbegu Bora (T) Ltd	Mbeya	Local
9	Mega Generics Ltd	Arusha	Local
10	Meru Agro Tours & Consultants Co. Ltd	Arusha	Local
11	Meru Seed Ltd	Arusha	Local
12	Multi Agroseed Main Suppliers Ltd (MAMS)	Arusha	Local
13	Namburi Agricultural Co. Ltd	Vwawa -Songea	Local
14	Quton(T) Ltd	Mwanza	Local
15	RIETA Agrosciences (T) Ltd	Songea	Local
16	Suba Agro Trading & Engineering Co. Ltd	Arusha	Local
17	Tropical Seeds	Mbeya	Local
16	Zanobia Seeds Ltd	Arusha	Local
17	Zoissa Seed Multiplication	Arusha	Local
18	Alssem Seed Co. Ltd	Arusha	Local
19	Advanta Seed (T) Ltd	Arusha	Multinational
20	Arysta Life Agencies	Arusha	Multinational
21	Bajuta International	Arusha	Multinational

#	Seed company	Location of HQs	Category
22	Balton (T) Ltd	Arusha	Multinational
23	Corteva Seed (T) Ltd	Arusha	Multinational
24	East West Seed Co. Ltd	Moshi	Multinational
25	Enza Zaden Africa Ltd	Arusha	Multinational
26	Lima Africa Co. Ltd	Arusha	Multinational
27	Multiflower Seed Co. Ltd	Arusha	Multinational
28	Osho Seed Co. Ltd	Arusha	Multinational
29	Rijk Zwaan Ltd	Arusha	Multinational
30	Sakata Seed Co Ltd	Arusha	Multinational
31	Syngenta Co. Ltd	Arusha	Multinational
32	Monsanto/Bayer (T) Ltd.	Arusha	Multinational
33	ASA	Morogoro	Public
34	Prisons Corporation Sole	Morogoro	Public
35	SUA	Morogoro	Public
36	TARI	Morogoro	Public
37	Africasia Seed Co. Ltd	Arusha	Regional
38	Agrimatco Seed	Arusha	Regional
39	Bytrade (T) Ltd	Dar es Salaam	Regional
40	Continental Seed Co. Ltd	Arusha	Regional
41	FICA Seed Ltd	Arusha	Regional
42	East Africa Seeds (T) Ltd	Arusha	Regional
43	Kibo Seeds Co. Ltd	Arusha	Regional
44	One Acre Tanzania Ltd	Arusha	Regional
45	SeedCo (T) Ltd	Arusha	Regional
46	Syova Seeds (T) Ltd	Arusha	Regional
47	Ultra Vetis (T) Ltd	Arusha	Regional
48	Western Seed Company Ltd	Arusha	Regional
49	Zambia Seed Co. Ltd	Arusha	Regional

ANNEX 5

LIST OF ACTIVE SEED COMPANIES IN TANZANIA IN 2014

#	Seed company	Location of HQs	Category
1	Zanobia Seed Ltd	Arusha	Local
2	Krishna Seed Company Ltd	Arusha	Local
3	Suba Agro-Trading and Engineering Co. Ltd	Arusha	Local
4	Mbegu Technologies	Moshi	Local
5	Tanseed International	Morogoro	Local
6	Mount Meru Seed Company	Arusha	Local
7	IFFA Seed Company	Arusha	Local
8	Highland Seed Growers Ltd	Mbeya	Local
9	Northern Seed Co.	Moshi	Local
10	Meru-Agro Tours	Arusha	Local
11	Aminata Quality seed	Tanga	Local
12	Tropical Seed Ltd	Mbeya	Local
13	Kipato Seed Ltd	Njombe	Local
14	Agriseed Technologies Ltd	Morogoro	Local
15	Kilimo Markets	Arusha	Local
16	Kibo Trading Co. Ltd	Moshi	Local
17	Meru Seed Company	Makambako	Local
16	Kisimbaguru Estates Ltd	Songea	Local
17	Monsanto (T) Ltd	Arusha	Multinational
18	Pannar Seed Ltd	Arusha	Multinational
19	Brac Tanzania	Dar es Salaam	Multinational
20	Bytrade (T) Ltd	Dar es Salaam	Multinational
21	ASA	Morogoro	Public
22	FICA Seed Ltd	Arusha	Regional
23	East African Seed	Arusha	Regional
24	Kibo Seed Co.	Arusha	Regional
25	Seedco (T) Ltd	Arusha	Regional

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