UNITED REPUBLIC OF TANZANIA

MINISTRY OF AGRICULTURE

TANZANIA AGRICULTURAL RESEARCH INSTITUTE (TARI)

TARI HORTICULTURE INVESTMENT PLAN 2025 - 2030

AUGUST 2025

EXECUTIVE SUMMARY

The Tanzania Agricultural Research Institute Horticulture Investment Plan (TARI-HIP) represents a results-based investment framework embedded within the Tanzania Agricultural Research Institute (TARI) Strategic Plan (2025–2030), instead of being a parallel or stand-alone agenda. Designed to operationalize TARI's Strategic Goals III–VII, the TARI-HIP serves as the institutional vehicle for channelling horticulture-related research investments that directly contribute to national transformation priorities while aligning with the quantitative targets of the Tanzania Horticulture Development Strategy (NHDS 2021–2031). In this way, the TARI-HIP functions as both a budgeted component of the TARI Strategic Plan and a compliance instrument under the Disbursement-Linked Indicator (DLI) framework agreed with IFAD.

The Plan is structured around eight interrelated thematic pillars, each linked to TARI's strategic outcomes and NHDS goals. Collectively, they target systemic bottlenecks across productivity, innovation, seed systems, post-harvest management, technology dissemination, climate resilience, institutional coherence, and gender/youth inclusion. Crucially, the TARI-HIP maps its interventions against NHDS quantitative milestones: doubling horticultural production to 15 million metric tons by 2030, reducing post-harvest losses to below 20 per cent, and expanding exports beyond TZS 668.8 billion.

The total investment envelope for 2025–2030 is estimated at TZS 52,946,800,000. Unlike the earlier draft, this allocation is explicitly embedded in the Ministry of Agriculture's Medium-Term Expenditure Framework (MTEF) and mapped to the TARI budget code, ensuring full institutional anchorage and financing predictability. Planned investments encompass salaries, operational costs, and capital expenditures across TARI centres and sub-centres, providing both geographic coverage and verification traceability. Financing will combine domestic public resources, development partner contributions, climate finance, and private sector co-investment.

Through its integrated approach, the TARI-HIP delivers more than research outputs: it functions as a policy-aligned, institutionally grounded investment framework. It provides government and partners with a transparent instrument for tracking how horticulture-specific R&D, technology adoption, and institutional strengthening contribute to NHDS outcomes and Tanzania's agricultural transformation agenda.

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ABBREVIATIONS

AEZ / AEZs	Agro **-**Ecological Zone(s)
AfCFTA	African Continental Free Trade Area
AGRA	Alliance for a Green Revolution in Africa
AI	Artificial Intelligence
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
ASDP-II	Agricultural Sector Development Programme Phase II
AU	African Union
CAADP	Comprehensive Africa Agriculture Development Programme
CAG	Controller and Auditor General
CCRO	Certificate of Customary Right of Occupancy
CGIAR	Consultative Group on International Agricultural Research
COPRA	Coffee and Other Produce Regulatory Authority
CSA	Climate Smart Agriculture
CSOs	Civil Society Organizations
DFIs	Development Finance Institutions
DLIs	Disbursement-Linked Indicators
EAC	East African Community
EGS	Early Generation Seed
ESG	Environmental, Social, and Governance
EU	European Union

FAO	**Food and Agriculture Organization**
FFS	Farmer Field Schools
FYDP III	Third Five-Year Development Plan
GAP / GAPs	Good Agricultural Practice(s)
GCC	Gulf Cooperation Council
GCF	Green Climate Fund
GRM	Grievance Redress Mechanism
HIP	Horticulture Investment Plan
icipe	International Centre of Insect Physiology and Ecology
ICT	Information and Communication Technology
IFAD	International Fund for Agricultural Development
IFMIS	Integrated Financial Management Information System
IP	Intellectual Property
IPDM	Integrated Pest and Disease Management
IPM	Integrated Pest Management
ISO	International Organization for Standardization
LGA / LGAs	Local Government Authority / Authorities
M&E / MEL	Monitoring and Evaluation / Monitoring, Evaluation, and Learning
MIT	Ministry of Industry and Trade
MoA	Ministry of Agriculture

MoF	**Ministry of Finance**
MTEF	Medium-Term Expenditure Framework
MUSE	Monitoring and Updating System for Expenditures
NGO	Non-Governmental Organization
NHDS	National Horticulture Development Strategy
NSC	National Steering Committee
OpEx	Operational Expenditures
PA	Protected Area
PlanRep	Planning and Reporting System
PO-RALG	President Office – Regional Administration and Local Government
PPP / PPPs	Public–Private Partnership(s)
PRA	Pest Risk Analysis
R&D	Research and Development
R&I	Research and Innovation
RBF	Results-Based Financing
RBM	Results-Based Management
SDGs	Sustainable Development Goals
SOP / SOPs	Standard Operating Procedure(s)
SPS	Sanitary and Phytosanitary
SWOT	Strengths, Weaknesses, Opportunities, and Threats

TARI	Tanzania Agricultural Research Institute
TBS	Tanzania Bureau of Standards
TFRA	Tanzania Fertilizer Regulatory Authority
TMA	Tanzania Meteorological Authority
ToC	Theory of Change
ToRs	Terms of Reference
TOSCI	Tanzania Official Seed Certification Institute
TPHPA	Tanzania Plant Health and Pesticide Authority
TSh / TZS	Tanzanian Shilling
TWG / TWGs	Technical Working Group(s)
UN Women	United Nations Entity for Gender Equality and the Empowerment of Women

FOREWORD FROM THE BOARD CHAIRPERSON

The Tanzania Agricultural Research Institute (TARI) Horticultural Investment Plan (TARI-HIP) serves as a roadmap for the effective management of horticultural research in Tanzania through enhanced research infrastructure, human resources, opportunities and the quality of research outputs.

The TARI-HIP encompasses not only the responsibilities of TARI Horticultural Research Resource Management but also integrates the activities of all stakeholders engaged in horticultural research across the country. It acknowledges the diverse contributions of research and academia institutions, farmer-based groups, private companies, government agencies and non-governmental organizations.

Our initiatives will be grounded in the most reliable information, knowledge and experiences available drown from both generated research and local indigenous insights and knowledge. We are committed to continuously expanding this knowledge base to enhance its utility in guiding horticultural research efforts. Through the TARI Horticultural Investment Plan, we aim at coordinating actions throughout the value chain from soil management for horticultural production to seed enhancement, implementation of good agricultural practices, post-harvest management, value addition, marketing strategies, consideration of gender issues and informed decision-making.

The TARI Horticultural Investment Plan (2025-2030) is meant to unify efforts that will enhance horticultural productivity while sustainably improving the livelihoods of individuals within this sector and contributing positively to the overall national economy.

Andrew W. Masawe
BOARD CHAIR PERSON

STATEMENT FROM THE DIRECTOR GENERAL

To Our Valued Partners and Future Investors in horticultural sector in Tanzania.

The journey of horticultural research has always been defined by a persistent pursuit of innovation and a deep commitment to delivering valued technologies to our customers. As we navigate an evolving global landscape, we are at a critical moment for developing Tanzania Agricultural Research Institute Horticultural Investment Plan (TARI-HIP) for enhancing horticulture sector in the country. This investment plan represents a strategic idea, designed to accelerate our research leadership and capitalize on emerging opportunities in the horticultural research sector.

We are particularly excited by the growth potential in horticulture sector including production up to marketing segments, where our unique advantages in crop improvement, good agricultural practices, water-use efficiency, postharvest management, value addition, marketing and advice on informed decision provides a powerful platform for success. This investment will fuel our development in these key areas, enabling us to enhance our digital capabilities, sustainable practices, product portfolio and further solidify our competitive advantage.

We are confident that this investment plan allocation of capital will not only drive significant growth but also deliver superior returns for our investments. Our dedicated team is fully aligned with this vision, and we are eager to execute this ambitious plan, reinforcing TARI's position as a leader in the horticultural research sector.

Thank you for your continued support and for considering this exciting opportunity to partner with us as we embark on this new chapter of implementing the TARI-HIP.

Dr. Thomas N. Bwana
DIRECTOR GENERAL

CHAPTER ONE INTRODUCTION

1.1 Background and Rationale

The horticulture sector in Tanzania represents one of the most dynamic frontiers of agricultural transformation, underpinned by its capacity to generate high economic returns, enhance national food and nutrition security, and catalyse inclusive employment opportunities. In a country where agriculture remains the backbone of livelihoods, the strategic shift toward high-value crops, including fruits, vegetables, herbs and spices, and floriculture, signals both a developmental imperative and a pathway to global competitiveness. Tanzania's favourable agro-ecological endowments, coupled with a growing domestic market and expanding export opportunities, position horticulture as a critical engine for driving structural transformation, diversifying incomes, and strengthening resilience within rural economies.

Yet, the potential of the sector remains underutilized due to persistent structural challenges, including limited research investment, inadequate human capital, inadequate infrastructure, post-harvest losses, low productivity and market integration, inaccessibility to technologies, limited financial resources, and unreliable markets. These constraints necessitate an investment plan that is evidence-based, strategically sequenced, and institutionally grounded.

Within this context, the Tanzania Agricultural Research Institute Horticulture Investment Plan (TARI-HIP) is conceived not as an isolated research agenda but as a strategic investment framework embedded in the Tanzania Agricultural Research Institute (TARI) Strategic Plan (2025–2030). Its purpose is to operationalize TARI Strategic Goals III–VII by channelling targeted investments into horticulture research, innovation, and extension. This integration ensures compliance with Disbursement-Linked Indicator (DLI) verification requirements while embedding horticulture within the national planning and budgeting framework. More importantly, it positions horticulture as a lever for advancing Tanzania's broader agricultural transformation objectives, ensuring that research investments are aligned with institutional mandates, national priorities, and global development commitments.

1.2 Strategic Importance of Horticulture in National Development

Horticulture holds a strategically vital role within Tanzania national development agenda, functioning as a multifaceted driver of economic growth, food and nutrition security, job creation, and climate resilience. Its cross-cutting relevance spans national policy frameworks, regional integration aspirations, and global sustainability commitments, positioning it as a pivotal sub-sector in the broader agricultural transformation in the country. As a sector, horticulture offers not only developmental dividends but also a pathway to inclusive, climate-smart, and export-oriented growth.

The contribution of the sector to the food and nutrition sub-sector is manifold (quantify how the horticulture sector contributes to the food and nutrition sector). It ensures food and nutritional security and the year-round supply of diverse micronutrient-rich fruits and vegetables, which are critical in combating malnutrition and enhancing public health outcomes. In this respect, horticulture directly supports the National Multisectoral Nutrition Action Plan for 2021/22–2025/26 and other nutrition-sensitive strategies. Economically, it is an inclusive platform for youth and women employment, offering accessible entry points across the value chain from input provision and production to processing and export, enabled by short production cycles and low initial capital requirements. At the macroeconomic level, horticulture contributes significantly to household incomes and foreign exchange earnings, particularly through the growing global demand for high-value crops such as avocado, mango, chilies, and spices. This positions the sector as a key driver of export diversification, reducing dependence on traditional cash crops. Furthermore, horticulture advances Tanzania climate adaptation agenda by adopting sustainable practices, such as agroforestry, efficient irrigation, and organic farming, thereby enhancing ecological resilience while supporting carbon sequestration and biodiversity conservation. Together, these dimensions underscore the catalytic potential of horticulture in driving inclusive, resilient, and sustainable development.

1.3 Institutional and Policy Context

Tanzania horticulture sector is anchored within a coherent and nationally endorsed institutional and policy ecosystem designed to accelerate agricultural modernization, economic diversification, and climate resilience. The Tanzania Agricultural Research Institute Horticulture Investment Plan (TARI-HIP) is not an isolated initiative; it is a strategically harmonized investment vehicle, deliberately aligned with the country's overarching frameworks: ASDP-II, FYDP III, the Climate Smart Agriculture Program, and Tanzania Development Vision 2050 to ensure both policy coherence and resource optimization.

1.3.1 Strategic Alignment and Policy Coherence

At the heart of this context is the Agricultural Sector Development Programme II (ASDP-II), which charts the transition from subsistence farming to a modern, competitive, and market-oriented agricultural sector. Horticulture as a labour-intensive, high-value sub-sector, is positioned as a priority driver of productivity growth, income enhancement, and agro-industrial linkages. The Third Five-Year Development Plan (FYDP III) amplifies this priority by framing horticulture as a growth engine for agro-processing, youth employment, and export competitiveness, advocating for public–private partnerships, regional integration, and strategic corridor development.

1.3.2 Integration with Long-Term National and Global Agendas

The TARI-HIP is fully harmonized with Tanzania's long-term aspirations, including Vision 2050, Agenda 2030, and Agenda 2063, ensuring that research and innovation investments are embedded within national planning, budgeting, and results frameworks. This makes the plan not just a technical document but a high-impact delivery instrument capable of converting national ambition into measurable outcomes from post-harvest loss reduction to market access expansion and climate resilience.

1.3.3 Climate-Smart and Inclusive Development Orientation

Recognizing climate change as a systemic risk, the plan aligns with the Tanzania Climate Smart Agriculture Programme (2015–2025), promoting greenhouse technologies, efficient irrigation, and integrated pest management as pathways to build resilient livelihoods and reduce emissions intensity. It also addresses inclusivity, explicitly targeting youth and women participation, nutrition-sensitive interventions, and equity in access to technologies and markets — consistent with Agenda 10/30 priorities.

1.3.4 Institutional Architecture and Stakeholder Roles

A network of critical regulatory and development actors supports the creation of an enabling environment.

- TPHPA ensures phytosanitary compliance and facilitates export market access.
- COPRA enforces grades and standards, formalizes stakeholders, and promotes structured marketing systems to minimize losses.
- TISEZA and TanTrade drive investment promotion and trade facilitation.
- LGAs ensure land-use planning and extension delivery at local levels, while TBS guarantees compliance with international standards.
- The private sector plays a catalytic role in innovation, quality assurance, and export growth

1.3.5 Strategic Significance

Embedding horticulture within these institutional and policy pillars, the TARI-HIP transforms from a research plan into a nationally owned, results-oriented investment platform. Its science-driven innovation, public–private partnerships, and strong coordination mechanisms mirror global best practices in agri-food transformation, positioning Tanzania as a regional leader in competitive, climate-resilient horticulture by 2030.

1.4 Cross-Sectoral Linkages and Integration

Horticulture in Tanzania serves as a strategic nexus sector, connecting agriculture to nutrition, health, trade, the environment, gender, and youth agendas, thereby amplifying its capacity to deliver systemic, economy-wide impact. Far beyond its role as a food production activity, horticulture is positioned as a catalyst for inclusive transformation, advancing multiple national priorities simultaneously and reinforcing Tanzania transition toward a diversified, competitive, and resilient economy.

1.4.1 Nutrition and Health Outcomes

As a driver of dietary diversification, horticulture plays a pivotal role in combating malnutrition and micronutrient deficiencies. Increased production and consumption of fruits and vegetables rich in vitamins, minerals, and antioxidants support maternal and child health, strengthen immune systems, and reduce the prevalence of diet-related diseases. This contribution directly underpins the National Multi-Sectoral Nutrition Action Plan (NMNAP). It aligns with strategies of the Ministry of Health, making horticulture a frontline instrument in advancing public health and human capital development.

1.4.2 Environmental Sustainability and Climate Resilience

Horticulture is a natural entry point for advancing climate-smart and regenerative agriculture. Through agroforestry, organic farming, water-efficient irrigation, and integrated pest management, the sector enhances soil health, rehabilitates degraded ecosystems, and contributes to carbon sequestration. These practices support Tanzania's commitments under the Climate Smart Agriculture Programme, the National Environmental Policy (2021), the National Ecological Organic Agriculture Strategy (2023–2030), and global frameworks such as SDGs 12, 13, 15 and the UNFCCC, thus positioning horticulture as a cornerstone of the country's climate adaptation and mitigation strategy

1.4.3 Trade, Industrialization, and Competitiveness

Horticulture's export-oriented crops, such as avocados, mangoes, chilies, and floriculture, generate foreign exchange earnings and enable deeper participation in regional and global value chains. Investments in cold chain infrastructure, value addition facilities, and sanitary and phytosanitary (SPS) systems are transforming Tanzania into a competitive supplier within the AfCFTA, EAC, and international markets. The capacity of the sector to link primary production to processing and logistics underpins agro-industrialization and the development of rural enterprises.

1.4.4 Gender, Youth, and Economic Inclusion

Labour-intensive and relatively accessible, horticulture serves as a platform for inclusive economic empowerment. Emerging opportunities in greenhouse technology, seedling nurseries, and digital agribusiness models attract youth participation and create pathways for women's leadership across value chains. This alignment supports Agenda 10/30, promoting equitable involvement and social inclusion.

1.4.5 Need for Coordinated Investment and Planning

To unlock these benefits at scale, cross-ministerial coordination is imperative. Harmonized planning between Agriculture, Health, Environment, Trade, Industry, and Local Government ensures coherent resource allocation, avoids duplication, and maximizes returns on public and donor investment. By embedding horticulture within integrated investment frameworks, Tanzania can mobilize public finance, donor assistance, and private capital around a unified vision for transformation.

1.4.6 Strategic Significance

Through these linkages, horticulture becomes a linchpin of Tanzania' inclusive development agenda, simultaneously addressing food security, public health, climate resilience, trade competitiveness, and job creation. This cross-sectoral integration ensures that horticulture is not treated as a narrow sub-sector, but as a strategic national growth lever capable of delivering compounded, multisectoral development outcomes.

1.5 Purpose of the TARI-HIP

The TARI-HIP serves as a strategic instrument to catalyse the transformation of Tanzania horticulture sector into a high-performing, inclusive, and climate-resilient engine of economic growth, food and nutrition security, and export competitiveness. It (TARI-HIP) is designed to operationalize national priorities by systematically identifying key investment areas, proposing scalable interventions, and aligning resources with impactful, evidence-based outcomes.

The primary objective of the Plan is to provide a structured roadmap that mobilizes public and private sector investments to unlock the full potential of horticulture across its value chains. The plan aims to enhance productivity, reduce post-harvest losses, strengthen research and innovation systems, and improve access to quality inputs, markets, and infrastructure while ensuring that women, youth, and marginalized groups are fully integrated into the sector's growth trajectory.

The TARI-HIP also aims to promote policy coherence and institutional alignment by bridging efforts across agriculture, nutrition, trade, climate, and local economic development. It is not merely a financial blueprint; it is a policy-integrated investment framework designed to guide resource allocation, inform donor engagement, and support implementation at national and sub-national levels.

1.6 Consultation Outcomes and Stakeholder Validation

The preparation of the TARI-HIP was not only a technical and analytical exercise but also a participatory process designed to secure legitimacy, inclusivity, and national ownership. Building on the extensive multi-stakeholder engagement undertaken during the formulation of the National Horticulture Development Strategy (NHDS 2021–2031), the TARI-HIP adopted a selective validation approach to test and refine its investment priorities. This approach was deliberately chosen to avoid consultation fatigue, while ensuring that the perspectives of core national stakeholders, including the private sector, farmer organizations, regulatory agencies, and civil society, were reflected in the final design.

Consultations were carried out with a broad spectrum of actors across the horticulture ecosystem. Private sector representatives included the Tanzania Horticultural Association (TAHA), Tanzania Organic Agriculture Movement (TOAM), Sokoine University of Agriculture (SUA), Nelson Mandela Institution of Science and Technology (NM-AIST), World Vegetable Centre, Horti Tengeru, agro-input suppliers, seed companies, and export-oriented agribusinesses. Farmer cooperatives and producer organizations were engaged to ensure the plan addressed smallholder priorities, particularly with respect to productivity gaps, input access, and market power.

Civil society platforms, with a focus on nutrition, women, and youth in agribusiness, contributed perspectives on inclusivity and equity. At the same time, regulatory and technical institutions such as the Tanzania Official Seed Certification Institute (TOSCI), Agricultural Seed Agency (ASA), and Local Government Authorities (LGAs) guided feasibility, compliance, and implementation anchoring.

The validation process yielded several critical outcomes.

- First, stakeholders endorsed the alignment of the TARI-HIP with NHDS quantitative targets, particularly the goals of doubling production to 15 million MT, reducing post-harvest losses to below 20 per cent, and expanding export competitiveness.
- Second, stakeholders emphasized the importance of investment in cold-chain infrastructure, seed systems, and digital extension platforms as priority enablers of transformation.
- Third, civil society representatives highlighted the need for systematic integration of gender and youth dimensions, ensuring equitable access to opportunities along the value chain. Finally, regulatory bodies and local governments stressed the necessity of embedding TARI-HIP financing into the TARI Strategic Plan (2025–2030) and the Ministry of Agriculture's Medium-Term Expenditure Framework (MTEF) to ensure sustainability and accountability.

1.7 Layout of the TARI-HIP

The TARI-HIP is organized into eight interlinked chapters that together form a coherent and evidence-based roadmap. Chapter 1 introduces the background, rationale, and institutional integration of the TARI-HIP within TARI Strategic Plan. Chapter 2 provides a diagnostic analysis of the sector's performance, challenges, and opportunities. Chapter 3 sets out the vision, theory of change, and guiding framework. Chapter 4 details strategic investment priorities across eight thematic pillars. Chapter 5 outlines the financing framework, while Chapter 6 specifies institutional and implementation arrangements. Chapter 7 presents the Monitoring, Evaluation, and Learning (MEL) plan, and Chapter 8 analyses risks and mitigation measures.

This layout ensures that the TARI-HIP is not only technically rigorous but also strategically aligned with TARI institutional mandate, MoA planning and budgeting systems, and the NHDS 2021–2031.

CHAPTER TWO DIAGNOSTIC REVIEW OF THE HORTICULTURE SECTOR

2.1 Context and Strategic Imperative

Tanzania horticulture sector sits at the centre of the country agricultural transformation agenda, representing a powerful lever for economic diversification, job creation, nutrition security, and export growth. With production estimated at 7.5 million metric tons in 2024, the sector has experienced rapid growth; yet, substantial untapped potential remains. The Tanzania Horticulture Development Strategy (NHDS 2021–2031) sets an ambitious target to double production to 15 million metric tons by 2030, while simultaneously reducing post-harvest losses to below 20 per cent.

The TARI Horticulture Investment Plan (HIP) is positioned as the institutional vehicle to operationalize this ambition. It seeks to strengthen research, accelerate technology adoption, develop resilient seed systems, and close yield gaps, thereby aligning horticulture transformation with FYDP-III, the ASDP-II, and the TARI Strategic Plan (2025–2030). Further details, including the complete diagnostic analysis and underlying data, are presented in ***Annex 1.***

2.2 Spatial and Production Landscape

The analysis maps horticultural production across seven agro-ecological zones (AEZs), emphasizing zone-specific comparative advantages. High-value vegetables and fruits thrive in the Northern Highlands, while the Southern Highlands and Lake Zone serve as key aggregation hubs. The Coastal Belt and Lake Zone provide access to domestic and cross-border markets, while the Western Zone remains underexploited but holds great promise. Production is dominated by smallholders (≈85%), supplemented by emerging medium-scale growers and commercial export-oriented estates; a structure that calls for differentiated technology dissemination, infrastructure support, and market integration strategies.

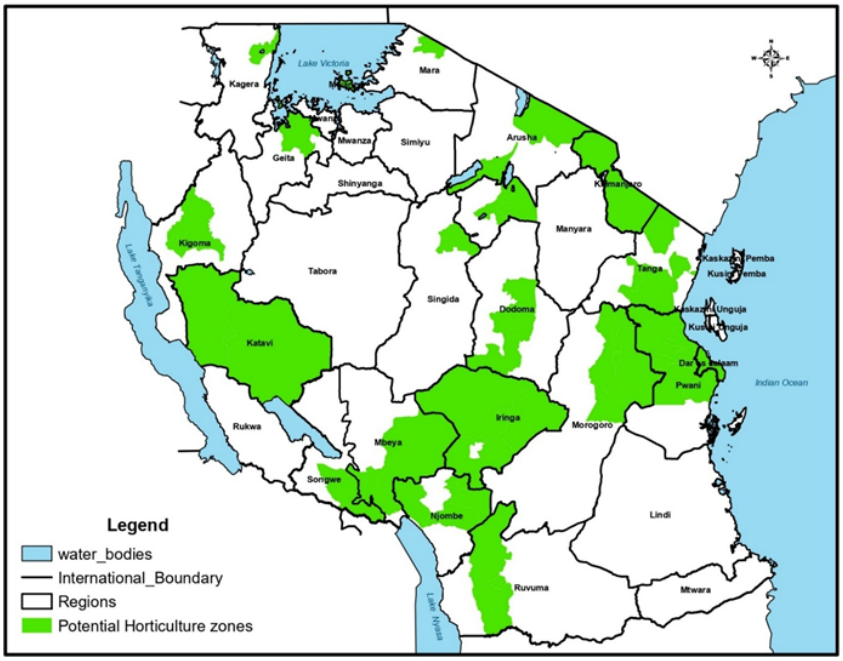


Figure 01: Horticultural Agro-Zones

2.3 Market and Value Chain Insights

Despite constraints, horticultural exports nearly doubled to TZS 668.8 billion in 2023/24, indicating strong demand potential. However, weak aggregation systems, high transaction costs, and limited compliance with SPS and quality standards constrain competitiveness. The diagnostic recommends scaling cooperative models, contract farming arrangements, pack houses, and traceability systems to strengthen market efficiency and farmer participation.

2.4 Research and Institutional Alignment

TARI's zonal research centres provide a robust platform for innovation but require modernization and stronger links with private sector actors. The HIP seeks to reorient research from a supply-driven to a demand-driven model, integrating farmer feedback, digital extension tools, and commercialization pathways. Importantly, all HIP interventions are programmed under the Ministry of Agriculture's MTEF and TARI budget code, ensuring institutional ownership, sustainability, and accountability.

2.5 TARI-HIP Contribution Pathways to NHDS 2021–2031 Targets

To ensure alignment with national policy frameworks and to demonstrate verifiable contributions to sectoral transformation, the TARI-HIP explicitly anchors its interventions to the quantitative targets set out in the Tanzania Horticulture Development Strategy (NHDS 2021–2031) and the institutional mandate of the TARI Strategic Plan (2025–2030). While the NHDS calls for a doubling of production to 15 million metric tons, a reduction of post-harvest losses to below 20 per cent, and the expansion of export competitiveness, the TARI SP emphasizes research excellence, institutional capacity, and results-driven innovation. Table 1 presents a crosswalk matrix that maps TARI-HIP interventions against these national targets, drawing on NHDS baselines and TARI's institutional framework. It illustrates how TARI-HIP-supported research, technology adoption, seed systems, post-harvest innovations, and institutional capacity-building will cumulatively contribute to achieving Tanzania horticultural development milestones by 2030.

Table 1: Crosswalk Matrix: TARI-HIP Interventions and Contributions to NHDS 2021–2031 Targets

TARI-HIP Intervention	**NHDS Target (2021–2031)**	**Baseline (NHDS/TARI)**	**Projected TARI-HIP Contribution**
Improved crop varieties, climate-smart R&D, and dissemination of Integrated Pest Management (IPM) and Good Agricultural Practices (GAPs)	Raise horticultural production from 7.56 million MT (2019/20) to 15 million MT by 2030	National production baseline: 7,560,010 MT in 2019/20	TARI-HIP research-led productivity gains (new varieties, GAP/IPM adoption) expected to drive 3–4 million MT of the additional output within the national target, particularly in tomatoes, onions, and indigenous vegetables.
Seed systems strengthening (EGS and certified seeds, private sector partnerships, TOSCI/ASA engagement)	Expand productivity to close yield gaps (e.g., tomatoes from 8–10 MT/ha toward 45–60 MT/ha regional benchmarks; onions from 12–15 MT/ha toward 25–35 MT/ha)	Tomato: 8–10 MT/ha; Onion: 12–15 MT/ha	TARI-HIP seed R&D and certified seed distribution projected to raise tomato yields to 15–20 MT/ha and onions to 18–20 MT/ha by 2030 in TARI-HIP -targeted clusters.
Post-harvest and cold-chain innovations (pack houses, storage technologies, processing facilities, logistics R&D)	Reduce post-harvest losses from 30–40% to below 20% by 2030	Current losses: 30–40% depending on crop and zone	TARI-HIP post-harvest research and technology piloting projected to cut losses by 10–12 percentage points, directly contributing to the NHDS <20% loss reduction goal.
Export competitiveness research (standards, traceability, certification systems)	Expand horticulture exports, which grew from USD 412m (2015) to USD 779m (2019), toward doubling to TZS 668.8 billion+ by 2030	Exports: TZS 668.8 billion in 2023/24	TARI-HIP's certification and traceability research expected to enable compliance for high-value crops, sustaining at least 25–30% of incremental export growth within NHDS targets.
TARI Centre/Sub-Centre investments	Strengthen research capacity and align with	17 Research Centres under TARI operational,	TARI-HIP investments will dedicate horticulture-
Capacity-building and extension (training, digital M&E, stakeholder engagement)	Build national capacity to deliver on NHDS objectives by 2031	Current extension ratio: ~1:2,500 farmers	TARI-HIP will institutionalize digital learning platforms, farmer training modules and ToT, improving adoption rates and directly supporting delivery of NHDS production and post-harvest goals.

The crosswalk matrix confirms that the TARI-HIP functions not as a parallel planning document but as a results-based investment framework that anchors national horticultural development within verifiable outcomes. Also, by systematically linking research, seed systems, technology dissemination, post-harvest solutions, and institutional capacity-building to the quantified targets of the NHDS (2021–2031) and the TARI Strategic Plan (2025–2030), the TARI-HIP establishes a credible attribution mechanism for measuring progress.

2.6 Investment Issues Identified from the Diagnostic Analysis

The analytical review presented in Chapter Two surfaces a coherent set of structural barriers and performance constraints that continue to impede the transformation of Tanzania horticultural sector. These issues span the entire value chain from upstream research and production inefficiencies to downstream post-harvest, market, and institutional challenges. The following eight thematic areas synthesize the most binding constraints, each of which presents a compelling case for targeted investment, institutional reform, and capacity strengthening under the TARI-HIP.

2.6.1 Low Productivity and Agronomic Inefficiencies

National productivity levels for most horticultural crops fall significantly below regional and global benchmarks. For example, average tomato yields in Tanzania are estimated at 10–15 tons per hectare, compared to over 60 tons per hectare in leading countries. Similarly, grape productivity is 4-10 tons/ha, compared to the potential yield of 20-25 tons/ha. Several factors, including the limited adoption of improved seed varieties, poor soil fertility management, a lack of irrigation infrastructure, and the absence of tailored, site-specific agronomic packages, drive this yield gap. In many zones, farmers rely on recycled seed and outdated cultural practices, resulting in low input use efficiency and vulnerability to pests and diseases. The diagnostic points to a critical need for scaling integrated crop management approaches, varietal replacement strategies, and adaptive research embedded in the agro-ecological diversity of Tanzania.

2.6.2 Underdeveloped Research and Innovation Systems

While TARI is mandated as the national engine for agricultural innovation, its capacity to respond to the dynamic needs of the horticultural sector is severely limited. Most research facilities lack modern laboratories, phenotyping platforms, or data analytics infrastructure. Furthermore, staffing levels in horticultural research programs are critically low, and institutional budgets allocated to horticulture account for less than 10per cent of the overall research envelope. This underinvestment constrains the development and timely release of new technologies and limits the ability of the institute to engage in public-private partnerships or leverage international research collaborations. TARI must elevate its operational and scientific capabilities, as global horticulture advances rapidly in biotechnology, digital agronomy (such as the use of Geographical Information systems (GIS) platforms, Satellites Imageries, drones etc.), and postharvest innovation..

2.6.3 High Postharvest Losses and Limited Value Addition

Losses along the horticultural value chain are alarmingly high, especially for fruit and vegetable crops. Empirical evidence from the field estimates postharvest losses of 30–40per cent due to poor harvesting techniques, absence of cooling facilities at aggregation points, and the lack of affordable, food-grade packaging materials. This problem is particularly acute in rural production clusters, where road infrastructure is weak, and access to structured markets is limited. The absence of cold chain logistics severely limits shelf life and export readiness, undermining both farm-level incomes and food system efficiency. Without urgent investment in scalable postharvest solutions and enterprise models for smallholder access, the sector may remain trapped in a cycle of low returns and high postharvest losses and waste.

2.6.4 Ineffective Seed and Planting Material Production Systems

The foundation of any productive horticulture system lies in the quality of seed and planting materials. In Tanzania, the formal seed system for horticultural crops is underdeveloped, with limited breeder and pre-basic seed production pipelines. Many farmers obtain seeds through informal channels, which can lead to varietal purity, disease transmission, and reduced productivity. Additionally, the varietal release process remains lengthy and poorly aligned with market demand or farmer preferences. The diagnostic highlights the need to institutionalize public-private seed platforms, accelerate adaptive variety trials, and enhance EGS multiplication infrastructure, including screen houses, mother blocks, and quality assurance laboratories.

Furthermore, the lack of cold seed storage infrastructure critically undermines seed viability and quality, particularly for temperature-sensitive horticultural planting materials. Without proper cold storage, seed quality deteriorates, resulting in lower productivity. Additionally, the lack of adequate seed processing infrastructure hinders the efficiency, quality, and scalability of seed production systems

2.6.5 Ineffective Technology Dissemination and Extension Services

There is a pronounced gap between research output and on-farm adoption. Despite the development of various technologies by TARI, including improved varieties with different essential attributes, the adoption rate remains low due to weak extension coverage, inadequate training materials, and poor feedback loops between farmers and researchers. For instance, the recently released TARI table and raisin grape varieties continue to experience a low adoption rate as compared to wine varieties due to limited extension services for technology outreach. Most LGAs have insufficient horticulture extension personnel and rarely deployed digital advisory tools at scale. This limits the reach of technology, especially among women, youth, and producers in remote agro-ecological zones. To close this gap, the investment plan must support robust knowledge translation systems, inclusive farmer training platforms, and digital extension innovations.

2.6.6 Increasing Vulnerability to Climate Change and Variability

Horticulture is among the sectors most exposed to climate-induced shocks, including erratic rainfall, prolonged dry spells, and surging pest and disease outbreaks. The inadequacy of current climate adaptation strategies, which is characterized by low uptake of resilient crop varieties, limited irrigation coverage, and poor integration of weather and early warning services, undermines yield stability and input efficiency. Inadequate climate-smart technologies, such as mulching films, net houses, and integrated pest management, further exacerbate exposure to risk. Strategic climate-proofing of the sector is imperative to ensure sustainability and the safeguarding of livelihoods.

2.6.7 Linkages to Climate Change Affected Areas

Building on this diagnostic, TARI-HIP explicitly maps horticultural production across seven Agro-Ecological Zones (AEZs), acknowledging that each faces distinct vulnerabilities. For example, the Northern Highlands are increasingly exposed to erratic rainfall and pest infestations, while the Southern Highlands experience prolonged dry spells that threaten year-round production. In the Lake Zone, flooding disrupts cropping cycles, whereas in the Coastal Belt, saline intrusion and rising temperatures are becoming serious risks. Since approximately 85% of producers are smallholders relying almost exclusively on rain-fed systems and basic farm infrastructure, these zones represent priority areas for targeted adaptation. Failure to address these risks could undermine productivity gains, weaken household food security, and reduce resilience to external shocks. The HIP therefore treats climate risk not as a peripheral issue but as a central determinant of horticultural competitiveness and farmer livelihoods.

2.6.8 Integration of Adaptive Technologies for Smallholders

To address climate variability and its impacts, the Plan integrates a comprehensive package of adaptive technologies that are science-driven, context-specific, and designed for scalability. These include:

- Stress-tolerant crop varieties that are resistant to drought, heat, and pests, ensuring yield stability across different AEZs.
- Water-efficient irrigation systems such as drip and localized irrigation, which reduce water wastage and enable production continuity during dry spells.
- Protective structures including shade nets, mulching films, and net houses that buffer crops against extreme heat, heavy rains, and pest pressures.
- Integrated Pest and Disease Management (IPM/IPDM) solutions that combine resistant varieties, biological control, and low-chemical approaches to mitigate climate-driven outbreaks.
- Localized early warning systems in partnership with the Tanzania Meteorological Authority (TMA) to deliver real-time forecasts, advisories, and decision-support tools to farmers.
- Soil and water conservation practices such as contour farming, agroforestry, and organic matter management, which enhance soil fertility, water retention, and long-term ecological resilience.

These technologies have been prioritized because they not only safeguard yields but also provide low-cost, practical solutions for smallholder farmers who often face financial and institutional constraints.

2.6.9 Pathways to Benefit Smallholders

Recognizing that access and adoption are as important as technology development, the Plan sets out clear pathways to ensure smallholder farmers directly benefit from adaptive innovations:

- Extension and dissemination systems
  The HIP prioritizes digital advisory platforms, farmer field schools, and participatory research trials to bring knowledge to the last mile. Demonstration plots will be used to showcase technologies in real farming contexts, increasing farmer trust and adoption rates.
- Strengthened delivery partnerships
  Implementation is designed around partnerships with Local Government Authorities (LGAs), the Tanzania Horticultural Association (TAHA), farmer cooperatives, and CSA networks to ensure wide coverage and stronger farmer linkages.
- Inclusivity mechanisms
  Gender and youth-responsive models (anchored in Pillar 8) guarantee that women and young farmers are not passive beneficiaries but active participants in training, incubation programs, and entrepreneurship opportunities along value chains.
- Blended financing models
  Recognizing that affordability is a barrier, the Plan leverages blended climate finance mechanisms such as the Green Climate Fund, concessional loans, and private co-investments to ensure adaptive technologies remain financially accessible. This approach lowers entry costs while catalyzing private sector innovation in climate-smart solutions.

Through these pathways, smallholders are positioned not merely as recipients of technology but as agents of resilience-building and agribusiness growth.

2.6.10 Results-Oriented Monitoring

To ensure accountability and measure tangible impact, the TARI-HIP integrates climate resilience indicators into its Results Alignment Matrix. These indicators go beyond input tracking to focus on actual behavioral and system changes.Tracking these indicators provides verifiable evidence that adaptive technologies are reaching the intended beneficiaries, improving resilience, and safeguarding national food system stability. In addition, adaptive monitoring frameworks will allow for real-time adjustments, ensuring interventions remain responsive to evolving climate dynamics.

2.6.11 Policy and Institutional Fragmentation

The policy landscape for horticulture in Tanzania is evolving, with notable progress in various areas. However, there remain opportunities to enhance coherence and alignment across relevant policies and institutions. Currently, overlaps in mandates, variations in regulatory approaches, and periodic changes in export and trade-related procedures can present challenges for stakeholders and may thus deter potential investors. Improved coordination could also help address technical and operational challenges. Furthermore, the existing institutional frameworks would benefit from a more dedicated coordination mechanism and a horticulture-specific policy approach to enable more integrated planning and implementation of sectoral programs. Strengthening these aspects can help unlock the full potential of horticulture as a driver of economic growth and rural development.

2.6.12 Gender and Youth Exclusion

Despite constituting the majority of the horticultural labour force, women and youth face structural exclusion from innovation systems, asset ownership, and opportunities for enterprise development. Barriers include limited access to training, land, finance, and decision-making platforms. Gender-blind research design, male-dominated extension models, and youth-limited engagement from formal value chains further compound the problem. This exclusion not only limits productivity and innovation but also undermines the inclusivity and equity of the sector transformation agenda. Integrating gender-responsive and youth-inclusive models into research, extension, and entrepreneurship support is essential for ensuring that horticultural sector growth is broad-based and socially sustainable.

2.6.13 Safe and Responsible Use of Agrochemicals in Horticulture

The HIP positions the safe and responsible use of agrochemicals as an essential cross-cutting theme within its productivity and resilience pillars. The strategic intent is twofold: to protect human and environmental health, and to safeguard the sector's market credibility in both domestic and export arenas. The Plan therefore advances:

- **Mainstreaming Good Agricultural Practices (GAPs)**
  Institutionalizing farmer training on correct dosage, timing, and application methods to minimize residues and environmental contamination.
- **Scaling Integrated Pest and Disease Management (IPM/IPDM)**
  Prioritizing biological controls, resistant varieties, and ecological practices to gradually reduce chemical dependency while ensuring yield stability.
- **Regulatory Collaboration**
  Strengthening alignment with the Tanzania Plant Health and Pesticides Authority (TPHPA) and Tanzania Bureau of Standards (TBS) to enforce pesticide registration, labeling, and compliance monitoring.
- **Farmer Awareness and Protection**
  Expanding farmer field schools and digital advisory platforms to promote protective equipment use, safe storage, and environmentally sound disposal of chemical containers.
- **Equity and Inclusion**
  Ensuring women and youth, who constitute the majority of applicators and handlers at farm level, are systematically trained, equipped, and protected.

2.7 Sector Constraints, Performance, and Investment Opportunities

The horticulture sector in Tanzania stands at a critical juncture marked by rapid growth, untapped potential, but also persistent structural bottlenecks. While the sector has achieved remarkable expansion in both domestic production and export earnings, systemic constraints continue to suppress productivity, limit competitiveness, and exclude large segments of smallholders, women, and youth from higher-value opportunities.

This section consolidates three interlinked dimensions:

- **Constraints and Bottlenecks**
  The persistent barriers undermining productivity, efficiency, and inclusiveness across value chains, ranging from low yields and weak seed systems to post-harvest losses, climate vulnerabilities, and institutional fragmentation.
- **Sector Performance**
  A synthesis of recent achievements and trends, including growth in production volumes, export earnings, smallholder participation, emerging market niches, and policy alignment with national strategies such as ASDP-II, FYDP-III, and Vision 2050.
- **Opportunities for Strategic Investment**
  The high-potential areas for transformation, including high-value crops, underutilized agro-ecological zones, export logistics and cold chain systems, value addition and processing, climate-smart niches, and inclusive agribusiness models for youth and women.

Table 2, articulate these dimensions in an integrated manner, this diagnostic strengthens the TARI-HIP as both a policy decision-support tool and an investment-grade platform. It offers policymakers clarity on reform priorities, signals to development partners where catalytic financing can yield the highest impact, and presents private investors with transparent entry points into Tanzania's fast-growing horticulture sector.

Table 2: Horticulture Sector – Constraints, Performance, and Opportunities

Constraints / Bottlenecks	**Current Sector Performance**	**Opportunities for Strategic Investment**
Low Productivity & Yield Gaps – Yields for tomatoes (10–15 MT/ha) far below global average (40–60 MT/ha).	**Production Growth** – Output reached **7.5 million MT in 2024**, nearly doubling in the past decade.	**High-Value Crops** – Avocados, mangoes, chilies, onions, tomatoes, grapes, spices, floriculture, etc.
Research & Innovation Gaps – Outdated R&D infrastructure, weak funding, limited human capital.	**Export Expansion** – Earnings rose to **TZS 668.8 billion in 2023/24**, with avocados and vegetables driving growth.	**Geographic Expansion** – Untapped AEZs (Western, Central) and irrigable land in Southern Highlands & Coast.
Seed System Failures – Informal seed flows undermining varietal quality and resilience.	**Smallholder Dominance** – **85% of production** by smallholders; sector central to rural livelihoods.	**Export Competitiveness** – Investments in cold chains, packhouses, SPS certification, traceability.
Post-Harvest Inefficiencies – 30–40% losses from poor cold chains, weak aggregation, logistics gaps.	**Emerging Niches** – Growth in **floriculture** and **organic horticulture**, aligned with global demand trends.	**Value Addition** – Processing into juices, dried produce, spices, nutraceuticals to capture higher margins.
Extension Gaps – Limited coverage, weak digital advisory, poor adoption of innovations.	**Institutional Readiness** – TARI zonal centres and TAHA provide platform for scaling research and extension.	**Climate-Smart Niches** – Greenhouse farming, organic and regenerative practices for sustainability markets.
Policy & Institutional Fragmentation – Overlaps in mandates,	**Policy Alignment** – Integrated into **ASDP-II, FYDP-**	**PPP & Blended Finance** – De-risked investment models

CHAPTER THREE STRATEGIC VISION AND GUIDING FRAMEWORK

3.1 Vision Statement

The Vision Statement articulates the long-term strategic ambition for Tanzania horticulture subsector, serving as a unifying compass for investment prioritization, institutional reform, and policy alignment. The statement reflects a forward-looking commitment to building a resilient, inclusive, and innovation-driven horticultural economy that underpins national food system transformation and contributes to equitable and sustainable growth, as presented hereunder.

"A resilient, inclusive, and innovation-led horticulture subsector driving productivity, livelihoods, and national competitiveness."

3.2 Mission Statement

The Mission Statement outlines the operational mandate and institutional commitment of TARI in driving transformation of the horticulture subsector. It defines the core purpose and strategic approach through which TARI will deliver high-impact research, foster inclusive innovation, and strengthen systems that support productivity, resilience, and competitiveness, thereby positioning horticulture as a catalyst for rural development and national progress, as outlined below.

"To lead the development and uptake of inclusive, resilient horticultural innovations that boost productivity and advance national development goals."

3.3 Investment Goal of the Investment Plan

The investment goal of the TARI-HIP serves as the operational pillar through which TARI will translate its vision and mission into measurable results. These objectives are designed to address systemic constraints across the research production market continuum while advancing inclusive, resilient, and innovation-led transformation of the horticulture subsector. Each objective provides a targeted response to national development priorities and global commitments, aligning institutional capacity, technological advancements, and stakeholder engagement to drive sustainable impact at scale, as presented below.

"Transform the horticulture sector into a productive, resilient, and inclusive driver of socio-economic growth".

3.4 Theory of Change and Results Pathway

3.4.1 Strategic Framing

TARI-HIP seeks to catalyse the structural transformation of the horticulture subsector into a resilient, inclusive, and innovation-led driver of national prosperity. The Plan is firmly embedded within Tanzania policy and planning architecture, namely the FYDP III, ASDP II, and Agenda 10/30. It is purposefully aligned with the long-term aspirations articulated in Tanzania's Development Vision 2050, which envisions a high-productivity, knowledge-based economy underpinned by sustainable agriculture, technological innovation, and inclusive growth.

The Theory of Change presented in ***Figure 1*** offers a logically sequenced framework that operationalizes this vision. The theory posits that targeted, research-led investments across critical intervention areas, such as enhanced productivity, modernized post-harvest and logistics systems, innovation infrastructure, and gender- and youth-inclusive value chain development, will produce transformative and scalable outcomes. These outcomes include strengthened food systems resilience, accelerated and equitable economic growth, and an elevated contribution of horticulture to Tanzania global competitiveness. In doing so, the TARI-HIP becomes not merely a sectoral investment plan, but a strategic instrument for delivering on the structural shifts envisaged under Vision 2050.

3.4.2 Impact Statement

Positioning horticulture as a strategic driver of rural transformation, the TARI-HIP seeks to unlock inclusive economic growth, enhance food and nutrition security, and build climate-resilient livelihoods. The Plan envisions a sector that not only raises productivity but also deepens market integration, strengthens institutional systems, and empowers smallholders, particularly women and young people.

Transformed the horticulture sector into a resilient and inclusive engine of equitable growth and national development".

This impact is fully aligned with the World Bank twin goals of reducing poverty and promoting shared prosperity, as well as IFAD strategic objectives of enabling rural people to improve their incomes, strengthen food systems, and adapt to climate change. The TARI-HIP provides a scalable, research-based roadmap for delivering tangible outcomes across Tanzania diverse agro-ecologies, with a strong emphasis on evidence-based policy, innovation diffusion, and equity in access to opportunities.

3.4.3 Results Pathway

The Theory of Change for the TARI-HIP is operationalized through eight interrelated pathways that address key structural, institutional, and technical barriers facing the Tanzanian horticulture sector. These pathways constitute the strategic levers through which targeted investments will deliver measurable outputs, catalyse transformative outcomes, and ultimately achieve the desired long-term impact.

Each pathway is grounded in results-based logic linking research and innovation to adoption, institutional capacity, policy alignment, and equity. As described hereunder, these pathways provide a coherent, scalable, and inclusive framework for delivering on Tanzania horticultural transformation agenda.

- **Unlocking Productivity Gains**
  This pathway seeks to overcome the structural yield gaps and inefficiencies in horticultural production. TARI will prioritize the development of site-specific agronomic packages, the release of high-performing and climate-resilient crop varieties, and the institutionalization of integrated soil health, irrigation, and crop management practices. Adaptive research platforms and yield benchmarking systems will be established to generate evidence, track performance, and drive continuous improvement in the field-level productivity.
- **Strengthening Research and Innovation Systems**
  To anchor long-term transformation, this pathway focuses on modernizing the national horticultural research infrastructure. TARI will invest in state-of-the-art laboratories, phenotyping platforms, and digital analytics systems. These efforts will be complemented by the creation of public-private partnerships, strategic alliances with regional and international research institutions, and targeted capacity-building programs. Dedicated budget lines will ensure sustainability and scientific continuity within the research system.
- **Enhancing Post-Harvest Management and Value Addition**
  Recognizing the significant economic and nutritional losses incurred at post-harvest, this pathway addresses inefficiencies across the storage, transport, and processing chain. TARI will develop and promote context-specific post-harvest handling protocols, pilot scalable cold chain and packaging innovations, and validate cost-effective value addition technologies. Strengthening the skills and capacities of farmers, extension agents, and agro-processors will be essential to increasing produce quality and market competitiveness.
- **Revitalizing Seed System Architecture**
  A reliable supply of high-quality seed is foundational to agricultural productivity. This pathway supports the development of breeder and early-generation seed systems, as well as certification and quality control infrastructure, and governance platforms for seed sector coordination. TARI will implement varietal trials, improve seed storage and processing, and promote public-private engagement to ensure timely access to certified and adapted horticultural seed varieties for farmers.
- **Expanding Technology Dissemination and Advisory Services**
  To bridge the gap between research and application, this pathway will revitalize Tanzania horticultural extension architecture. TARI will deploy inclusive digital advisory platforms, establish demonstration plots across agroecological zones, and institutionalize participatory feedback mechanisms between researchers, Extension Officers, and farmers. The dissemination strategy will deliberately target all gender categories groups including women, youth, and geographically marginalized groups to ensure equity in access to innovation.

- **Embedding Climate Resilience in Production Systems**
  Given the sector vulnerability to climate shocks, this pathway integrates resilience across all stages of production. TARI will adapt and promote climate-smart technologies, including stress-tolerant varieties, integrated pest and disease management packages, and ecological soil management techniques. Localized early warning systems and tailored CSA practices such as mulching films, shade nets, and water-efficient irrigation will be validated through on-farm trials and scaled through national extension platforms.
- **Enhancing Policy Coherence and Institutional Coordination**
  This pathway addresses institutional and regulatory bottlenecks that hinder the adoption of technology and the integration of systems. TARI will work to align horticultural research priorities with national policy frameworks, improve vertical and horizontal coordination across institutions, and support evidence-based regulatory reforms. Dialogue platforms, technical briefs, and analytical products will be institutionalized to enhance policy responsiveness and decision-making informed by scientific evidence.
- **Promoting Gender Equity and Youth Inclusion**
  A transformative horticulture sector must be inclusive. This pathway mainstreams gender equality and youth participation across all program components. TARI will develop gender-responsive and youth-sensitive research protocols, strengthen engagement of all gender categories with emphasis of women and youth-led producer groups, and promote inclusive entrepreneurship models. Equity indicators will be embedded within M&E systems to ensure accountability and continuous learning on inclusion outcomes.

3.4.4 Underlying Assumptions

Successful implementation of the TARI-HIP depends on several enabling conditions institutional readiness, stakeholder engagement, adequate resources, market responsiveness, and farmer behavioural change. Monitoring these assumptions strengthens the Theory of Change, supports adaptive management, and mitigates risks across the results chain.

Assumptions from Activities to Outputs

i. Timely and adequate funding is available for implementation.
ii. Technical staff have the necessary expertise and tools.
iii. Infrastructure (labs, seed facilities, demo plots) is functional and accessible.
iv. Inputs (e.g., breeding material, ICT platforms) are procured timely.
v. Pilot sites and stakeholders are appropriately selected and engaged.

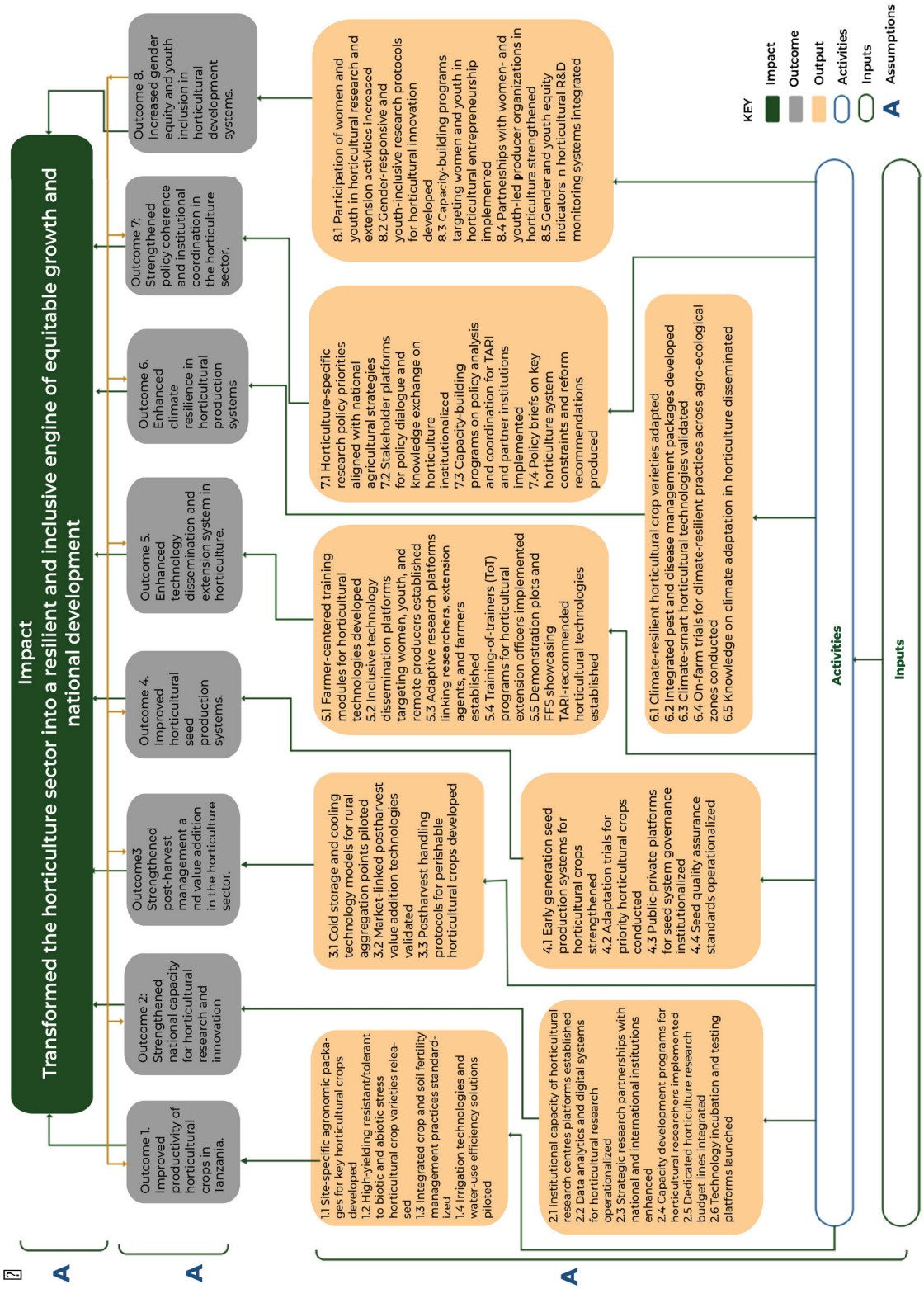
Assumptions from Outputs to Outcomes

i. Target users (farmers, Extensionists, SMEs) adopt and apply the technologies or practices.
ii. Training participants retain and transfer knowledge.
iii. Seed systems, advisory platforms, and market linkages are functional and scalable, enabling effective management of agricultural resources.
iv. Policy and regulatory institutions act on evidence and recommendations.
v. Gender- and youth-targeted interventions effectively reach and engage their intended beneficiaries.
vi. Post-harvest, CSA, and digital solutions are appropriate to local contexts.

Assumptions from Outcomes to Impact

i. Yield, quality, and market access improvements translate into increased income and resilience.
ii. Improved practices and innovations are sustained beyond the project timeline.
iii. National and regional markets absorb increased horticultural output.
iv. Climate and macroeconomic shocks remain manageable and do not reverse gains.
v. The government maintains its commitment to agriculture and research investment.

Figure 2: HIP Theory of Change Visualization



3.5 Pillar-to-Strategy Alignment Matrix

The TARI-HIP should be understood not as an autonomous research agenda, but as a strategically integrated investment program embedded within TARI SP (2025–2030). Its eight thematic pillars as presented in ***Table 3*** are deliberately structured to translate TARI's Strategic Objectives III–VII into actionable investment pathways that advance climate-smart technologies, enable multi-stakeholder adoption, generate policy and market intelligence, mobilize resources, and strengthen institutional knowledge systems. In parallel, the TARI-HIP is carefully aligned with the Tanzania Horticulture Development Strategy (2021–2031), ensuring national policy coherence and reinforcing Tanzania broader agricultural transformation agenda. Anchoring the TARI-HIP within TARI Results Framework and Medium-Term Expenditure Framework (MTEF), the plan is positioned not only as a technical blueprint for horticulture research but also as a results-based investment platform that is measurable, costed, and verifiable in line with results-based financing modalities.

Table 3 : Crosswalk: TARI-HIP Pillars → TARI SP 2025–2030 Strategic Objectives III–VII → NHDS 2021–2031 Objectives

TARI-HIP Thematic Pillar (2025–2030)	TARI SP 2025–2030 Strategic Objectives (III–VII)	NHDS 2021–2031 Strategic Objectives
Pillar 1: Enhancing Sustainable Horticultural Productivity	**Objective iii:** Increase the development of demand-driven climate-smart technologies, innovations, and practices for accelerating agricultural growth	**Objective i:** To increase the production capacity for fresh and processed horticultural products in Tanzania
Pillar 2: Strengthening Research and Innovation Capacity	**Objective iii:** Increase the development of demand-driven climate-smart technologies, innovations, and practices for accelerating agricultural growth **Objective vii:** Strengthen institutional knowledge management for enhanced learning, innovation, and policy influence	**Objective iii:** To strengthen Research and Development
Pillar 3: Improving Post-Harvest Management and Value Addition	**Objective iii:** Increase the development of climate-smart technologies and innovations for agricultural growth **Objective v:** Promote socio-economic, policy, and marketing research for evidence-based policymaking across commodity value chains	**Objective v:** To improve logistical infrastructure related to packaging, storage and transport facilities
Pillar 4: Improving Horticultural Seed Production Systems	**Objective iii:** Increase the development of demand-driven climate-smart technologies, innovations, and practices for accelerating agricultural growth	**Objective i:** To increase production and productivity capacity of fresh and processed horticultural produces in Tanzania
Pillar 5: Enhancing Technology Dissemination and Extension Services	**Objective iv:** Improve multi-stakeholder collaboration and partnership frameworks that promote the adoption of climate-resilient agricultural technologies	**Objective vii:** To enhance capacities along the horticulture value chain
Pillar 6: Building Climate Resilience in Horticulture	**Objective iii:** Increase the development of demand-driven climate-smart technologies,	**Objective ii:** To promote production and consumption of bio-
Pillar 7: Strengthening Policy Coherence and Institutional Coordination	**Objective v:** Promote socio-economic, policy, and marketing research for evidence-based policymaking across commodity value chains **Objective vi:** Strengthen resource mobilization to finance institutional capacity for effective mandate execution and leadership in national agricultural research and development	**Objective vi:** To strengthen coordination of the institutional and policy framework
Pillar 8: Promoting Gender Equity and Youth Inclusion	**Objective v:** Promote socio-economic, policy, and marketing research for evidence-based policymaking across commodity value chains **Objective vii:** Strengthen institutional knowledge management for enhanced learning, innovation, and policy influence	**Objective vii:** To enhance capacities along the horticulture value chain **Objective viii:** To facilitate financing and investment in the horticulture industry

3.6 Alignment with National and Regional Frameworks

TARI-HIP represents a strategically integrated blueprint for sectoral transformation, carefully aligned with Tanzania's national development agenda, regional obligations, and continental aspirations. Far from being a stand-alone research agenda, TARI-HIP is designed as a catalytic platform, reinforcing institutional credibility, policy coherence, and investor confidence while serving as a delivery mechanism for the country's broader agricultural modernization strategy.

3.6.1 National Alignment and Delivery

At the national level, TARI-HIP operationalizes the pillars of ASDP-II, converting them into actionable research and innovation pathways that advance climate-smart productivity, close yield gaps, and accelerate technology dissemination across priority horticultural value chains. The plan directly supports FYDP-III by linking research outputs to private-sector growth, youth employment, and rural competitiveness, thus embedding horticulture within Tanzania's socio-economic transformation agenda.

Equally important, the plan serves as an instrument for delivering Agenda 10/30, Tanzania's flagship commitment to increase agricultural productivity by 10per cent and cut post-harvest losses by 30per cent. By investing in seed systems, agronomic research, and value-added processing, TARI-HIP addresses systemic inefficiencies that limit productivity and value capture, thereby increasing farmer incomes and market participation.

3.6.2 Institutional and Research Alignment

The plan is harmonized with the Agricultural Research Master Plan, strengthening TARI's institutional mandate to deliver demand-driven innovations. This involves upgrading research infrastructure, investing in scientific talent, and fostering innovation ecosystems that are responsive to both farmer needs and market opportunities. This alignment ensures that research outcomes are not only academically sound but operationally relevant and scalable.

3.6.3 Regional and Continental Commitments

TARI-HIP positions Tanzania as a regional leader in advancing the objectives of the Comprehensive Africa Agriculture Development Programme (CAADP) and the Malabo Declaration, particularly in agricultural finance, resilience-building, and inclusive value chain development. It also contributes to the African Union Agenda 2063 by promoting food sovereignty, youth inclusion, and sustainable agricultural growth, aligning Tanzania's horticulture transformation with Africa's long-term vision for agricultural competitiveness and shared prosperity.

3.6.4 Vision 2050 and Global Responsiveness

The plan echoes the ambitions of Tanzania Development Vision 2050, which envisions a knowledge-driven, innovation-led agricultural sector as a foundation for national prosperity. TARI-HIP's design ensures that horticulture becomes a cornerstone of a high-performing, inclusive, and climate-resilient food system, linking research-driven interventions with institutional coordination and catalytic financing.

3.6.5 From Strategy to Execution

Importantly, this alignment sets the stage for Chapter Four, where the Theory of Change and Results Architecture translate strategic intent into operational logic. This progression establishes a clear bridge between vision and action, ensuring the plan is not only conceptually robust but also investment-ready and capable of delivering measurable transformation across the horticultural value chain.

4.1 Targeted Investments with Partners to Realize National Horticulture Development Goals (2021–2031)

The TARI-HIP functions as the primary instrument for operationalizing NHDS (2021–2031). Each investment pillar is explicitly aligned with NHDS objectives and national targets, and is designed to be implemented in partnership with both public and private stakeholders. Embedding its financial architecture within the TARI Strategic Plan and Medium-Term Expenditure Framework, the TARI-HIP becomes not merely a technical roadmap, but a costed, results-based investment platform. This ensures that by 2030, the national targets for productivity, innovation, post-harvest efficiency, climate resilience, and inclusive participation in horticulture will be both achievable and verifiable under results-based financing modalities.

Table 4 demonstrates how TARI-HIP planned investments, implemented in partnership with public and private stakeholders, directly operationalize the objectives of the Tanzania Horticulture Development Strategy (2021–2031) and contribute to the attainment of national horticulture development targets by 2030.

Table 4: TARI-HIP –NHDS Crosswalk Table (with 2030 Targets)

TARI-HIP Pillar & Planned Investments	Key Partners	Relevant NHDS Objective	Contribution to 2030 Targets (from NHDS)
1. Enhancing Sustainable Horticultural Productivity • Stress-tolerant varieties • Integrated crop–soil–water packages • GAP scaling	LGAs, farmer organizations, TAHA, WorldVeg, Universities	**SO.1:** Increase the production capacity of fresh and processed horticultural produces in Tanzania	Contributes to NHDS target of doubling national horticultural production from ~6.1m MT (2020) to 15m MT by 2030, ensuring consistent supply of fresh and processed produce.
2. Strengthening Research and Innovation Capacity • Laboratory upgrades • Phenotyping platforms • Digital analytics • Regional/international research alliances	CGIAR centres, WorldVeg, ICIPE, ASARECA, Universities	**SO.3:** Strengthen research and development	Supports NHDS target of at least 60% of horticultural actors accessing new R&D outputs and innovations by 2030.
3. Improving Post-Harvest Management and Value Addition • Cold storage, packhouses • Food-grade packaging • Agro-processing technologies	Private agro-processors, TanTrade, TISEZA, LGAs,SIDO, TBS, TFNC, Universities, TCAA	**SO.5:** Improve logistical infrastructures related to packaging, storage and transportation facilities	Contributes to NHDS target of reducing post-harvest losses from 40% to below 20% by 2030.
4. Revitalizing Seed Systems and Planting Materials • Breeder/EGS seed production • Certification systems • Cold storage for seeds	TOSCI, seed companies, farmer cooperatives	**SO.1:** Increase the production capacity of fresh and processed horticultural produces in Tanzania	Contributes to NHDS target of ensuring 80% of farmers access certified seed and quality planting materials by 2030.
5. Extension, Knowledge & Advisory Systems • Digital platforms	LGAs, ICT firms, youth agribusiness groups	**SO.7:** Enhance capacities of actors along the horticulture value chain	Supports NHDS target of training 500,000 farmers, extension agents, and SMEs by 2030 in improved

4.2 Strategic Investment Logic of the TARI Horticulture Investment Plan

The TARI-HIP applies a systems-thinking approach to transform Tanzania's horticultural sector by addressing productivity, resilience, and market competitiveness in an integrated way. Rather than relying on fragmented interventions, it bundles investments across eight mutually reinforcing pillars, ensuring that gains are scalable, inclusive, and sustainable. At its core, the plan strengthens research capacity, seed systems, and agronomic practices to resolve productivity constraints, then layers interventions in postharvest handling, value addition, and digital extension to unlock market potential. Climate resilience is mainstreamed across production zones, while policy coordination ensures alignment with national strategies. Finally, the plan embeds gender and youth inclusion, guaranteeing that the growth of the sector is socially equitable.

This sequenced investment logic prioritizes foundational enablers before market-driven investments, aligning with ASDP-II, FYDP-III, Agenda 10/30, and CAADP. The result is an investment-ready, action-oriented roadmap that mobilizes resources, coordinates stakeholders, and positions horticulture as a transformative driver of rural prosperity, economic diversification, and food system resilience.

Pillar 1: Enhancing Sustainable Horticultural Productivity

Pillar 1 establishes the agronomic foundation of the TARI-HIP, focusing on transitioning horticultural production from low-yield, input-inefficient systems to resilient, knowledge-driven ecosystems. It addresses yield gaps by deploying stress-resilient varieties, site-specific agronomic packages, and integrated soil–crop–water management tailored to agro-ecological zones. Investments target improved varietal development, standardized soil fertility management, water-efficient irrigation technologies, and farmer learning platforms. The result is higher yields, improved soil and water productivity, and stronger research–extension–farmer linkages, delivered through a five-year, TZs 4.40 billion investment envelope.

Pillar 2: Strengthening Research Infrastructure and Innovation Capacity

This pillar upgrades Tanzania's horticultural research infrastructure and builds institutional capabilities to generate, validate, and scale context-specific innovations. It invests in modernizing laboratories, research farms, greenhouses, and breeding facilities while enhancing scientific talent and research governance. The aim is to accelerate the development and dissemination of improved technologies and ensure that TARI becomes a centre of excellence for horticultural research. Outcomes include increased R&D outputs, stronger partnerships with universities and the private sector, and faster technology adoption rates.

Pillar 3: Reducing Postharvest Losses and Expanding Value Addition

Pillar 3 addresses critical bottlenecks in postharvest handling and value chains, where losses often exceed 30per cent. Interventions include investing in cold chain infrastructure, packhouses, grading and sorting facilities, and processing units for high-value perishables. The pillar promotes quality standards, traceability systems, and market-linked aggregation models to increase farmer incomes. By minimizing waste and extending product shelf life, this pillar enhances export competitiveness and strengthens domestic supply chains.

Pillar 4: Revitalizing Horticultural Seed Systems

This pillar reforms and modernizes seed systems to ensure timely availability of high-quality, certified seeds and planting materials. It strengthens breeder and early-generation seed production, seed certification systems, and regulatory compliance. Public–private partnerships are encouraged to scale multiplication and distribution of improved varieties. The goal is to increase seed replacement rates, safeguard varietal integrity, and ensure that smallholders have access to varieties with superior yield and market traits.

Pillar 5: Extension, Knowledge Management, and Digital Innovation

Pillar 5 focuses on bridging the last-mile knowledge gap between research and farmers. It integrates farmer-centred extension models, digital dissemination platforms, and ICT-enabled advisory services. Investments include strengthening local extension capacity, deploying e-extension systems, and creating interactive farmer knowledge platforms. This approach ensures that farmers receive timely, actionable information, thereby improving adoption rates, decision-making, and overall productivity.

Pillar 6: Mainstreaming Climate Resilience

Recognizing climate change as a key risk, Pillar 6 mainstreams resilience across all production systems. It invests in localized climate adaptation strategies, predictive early warning systems, integrated pest and disease management, and soil and water conservation measures. The objective is to build climate-proof horticultural systems that maintain productivity under increasing variability and stress, thereby safeguarding farmer livelihoods and national food security.

Pillar 7: Policy Coherence, Coordination, and Institutional Strengthening

This pillar ensures that horticulture is fully embedded within Tanzania's agricultural modernization agenda. It focuses on harmonizing institutional mandates, strengthening multi-actor coordination platforms, and embedding horticulture into national planning, budgeting, and monitoring frameworks. The result is improved governance, resource mobilization, and accountability, creating an enabling environment for both public and private investments.

Pillar 8: Gender, Youth, and Social Inclusion

Pillar 8 operationalizes inclusivity by integrating gender and youth considerations across research, capacity-building, and enterprise development interventions. It targets increased participation of women and youth in production, agribusiness, and decision-making roles. This pillar supports equitable access to resources, skills development, and finance, ensuring that horticultural growth is socially representative and contributes to broader goals of poverty reduction and shared prosperity.

Together, these eight pillars as presented in Table 5 form a coherent, investment-ready roadmap that drives productivity, innovation, value addition, climate resilience, and inclusive growth, positioning horticulture as a central driver of Tanzania's agricultural transformation and rural prosperity

Table 5: Summary of Strategic Investment Pillars

Pillar	Strategic Objective	Representative Outputs	Expected Outcomes	Indicative Budget (TZs)
Pillar 1: Enhancing Sustainable Horticultural Productivity	Unlock yield potential through site-specific agronomic solutions and stress-tolerant varieties	High-yielding stress-tolerant varieties released; Integrated crop-soil-water management practices developed	Improved productivity of horticultural crops in Tanzania	4,397,000,000
Pillar 2: Strengthening Research and Innovation Capacity	Modernize R&I systems and strengthen the TARI innovation ecosystem	Digital analytics systems operationalized; Strategic research partnerships established	Strengthened national capacity for horticultural research and innovation.	19,430,000,000
Pillar 3: Improving Post-Harvest Management and Value Addition	Reduce post-harvest losses and enhance value retention through improved storage and processing techniques.	Cold storage models piloted; Postharvest value-addition technologies validated	Strengthened post-harvest management and value addition in the horticulture sector.	4,245,000,000
Pillar 4: Improving Horticultural Seed Production Systems	Strengthen seed systems to improve availability, viability, and quality of planting materials.	Early-generation seed systems strengthened; variety trials and quality labs upgraded.	Improved horticultural seed production systems.	5,205,000,000
Pillar 5: Enhancing Technology Dissemination and Extension Services	Bridge the research–adoption gap through inclusive, digital, and localized extension systems	ToT programs implemented; Demonstration plots and farmer training modules developed	Enhanced technology dissemination and extension system in horticulture	6,067,000,000.

Pillar 6: Building Climate Resilience in Horticulture	Mainstream climate-smart technologies to enhance adaptive capacity and yield stability	Resilient varieties adapted; On-farm climate-smart practice trials conducted	Enhanced climate resilience in horticultural production systems.	5,860,500,000
Pillar 7: Strengthening Policy Coherence and Institutional Coordination	Align horticulture research and regulatory functions under a coordinated institutional framework.	Stakeholder policy platforms institutionalized; Policy briefs developed	Strengthened policy coherence and institutional coordination in the horticulture sector.	4,150,000,000
Pillar 8: Promoting Gender Equity and Youth Inclusion	Ensure inclusive sector growth by embedding gender and youth-responsive mechanisms.	Gender- and youth-inclusive R&I protocols adopted; Equity indicators integrated into M&E	Increased gender equity and youth inclusion in horticultural development systems.	3,592,300,000
TotalPillars Budget				**52,946,800,000**

4.3 Alignment with the National Horticulture Development Strategy (NHDS)

4.3.1 Policy Operational Synergy

The TARI (TARI-HIP) 2025–2030 is strategically positioned as the technical-operational arm of the National Horticulture Development Strategy (NHDS) 2021-2031. While the NHDS defines the national vision and policy compass for horticultural transformation, the TARI-HIP translates these ambitions into implementable pathways, research-driven interventions, and measurable outcomes. This alignment ensures that sectoral transformation is not only aspirational but also anchored in a structured program of research, innovation, and delivery.

4.3.2 Productivity and Competitiveness

The NHDS prioritizes enhancing productivity and reducing post-harvest losses as a cornerstone for horticultural growth. The TARI-HIP contributes by investing in climate-resilient seed systems, promoting Good Agricultural Practices (GAPs), and institutionalizing farmer training programs. Through these measures, TARI ensures that productivity gains are achieved and systematically scaled, thereby reinforcing the NHDS ambition of a more competitive and food-secure horticultural sector.

4.3.3 Research, Innovation, and Knowledge Transfer

The NHDS underscores the critical role of research and innovation in driving transformation. The TARI-HIP operationalizes this by strengthening TARI research capacity, fostering digital advisory services, and generating actionable knowledge products. This ecosystem enables evidence-based decision-making and accelerates the dissemination of innovations to farmers, thereby advancing the NHDS goal of embedding a culture of continuous innovation and knowledge application across the horticultural value chain.

4.3.4 Market Access and Value Chains

The NHDS identifies value addition and market competitiveness as strategic levers of transformation. The TARI-HIP directly supports this agenda by investing in post-harvest handling innovations, promoting agro-processing technologies, and establishing market intelligence systems. These interventions reduce losses, expand exports, and reinforce Tanzania's position in competitive regional and global markets, thereby operationalizing the NHDS goal of enhanced horticultural trade and sector competitiveness.

4.3.5 Institutional Coordination and Partnerships

The NHDS calls for greater coherence and accountability in sector governance. The TARI-HIP strengthens institutional coordination by facilitating multi-stakeholder forums, forging partnerships with the private sector, and collaborating with international research institutions. This coordinated approach ensures that horticultural growth is inclusive, synergistic, and aligned with national priorities, while also reinforcing the NHDS emphasis on governance and partnership-driven transformation.

4.3.6 Gender, Youth, and Inclusion

The NHDS emphasizes inclusive participation, particularly for women and youth. The TARI-HIP mainstreams these priorities by establishing gender-responsive extension services, promoting youth agripreneurship programs, and supporting women-led enterprises. These measures ensure that the benefits of horticultural transformation are equitably distributed, thereby reinforcing the NHDS goal of inclusive, broad-based growth that leaves no group behind.

4.3.7 Results Alignment Matrix

To operationalize this alignment, the TARI-HIP is accompanied by a Results Alignment Matrix presented in Table 6 that systematically maps NHDS targets against TARI-HIP contributions, expected results, measurable indicators, and annual milestones for 2025–2030. This monitoring-ready framework ensures that implementation progress can be tracked, reported, and evaluated in alignment with national horticultural transformation targets.

Table 6: Results Alignment Matrix

NHDS Target	TARI-HIP Contribution	Expected Results	Indicators	Annual M ilestones (2025–2030)
Increase horticultural productivity and reduce post-harvest losses by 30% by 2030	Development of climate-resilient varieties, promotion of GAPs, farmer training, seed system strengthening	Improved productivity and reduced losses at farm level	• % increase in yields per hectare • % reduction in post-harvest losses • Number of farmers trained on GAPs	2025: Baseline established 2026: 10% yield gain demonstrated in pilot districts 2027: 15% post-harvest loss reduction 2028: GAP training scaled to 50,000 farmers 2029: 25% yield gain in priority crops 2030: 30% loss reduction achieved nationally
Strengthen horticultural R&D and innovation systems	Expansion of TARI research infrastructure, knowledge products, digital advisory services	Evidence-based technologies and innovations adopted by farmers	• Number of new technologies developed• Number of knowledge products disseminated• Reach of digital advisory services	2025: 3 new technologies released 2026: Digital platform piloted in 5 zones 2027: 20,000 farmers accessing advisory services 2028: 10 technologies disseminated 2029: 50,000 farmers reached digitally 2030: 15+ technologies institutionalized
Expand horticultural exports and value addition by 20% by 2030	Investments in post-harvest handling, processing technologies, market intelligence systems	Increased competitivenes s of value added horticultural products in regional/global markets	• % increase in exports• Number of processing units supported• Market intelligence reports	2025: Market study completed 2026: 5 new processing pilots supported 2027: Export volumes up by 10%

Enhance institutional coordination and governance	Multi-stakeholder forums, private sector partnerships, collaboration with international R&D bodies	Strengthened sector governance, accountability, and partnerships	• Number of stakeholder forums held• Number of public–private partnerships (PPPs) established• Frequency of joint planning sessions	2025: 2 national stakeholder forums2026: 5 PPPs formalized 2027: Annual joint planning integrated2028: Regional coordination structures operational 2029: 10 PPPs active2030: Governance framework evaluated
Promote gender equity and youth inclusion in horticulture	Youth agripreneurship programs, gender-responsive extension, women-led enterprise support	Women and youth mainstreamed into horticultural value chains	• % of youth engaged in agribusiness• % of women-led enterprises supported• Number of gender-responsive extension officers trained	2025: Gender/youth baseline completed 2026: 200 youth enterprises supported 2027: 30% increase in women-led enterprises2028: 500 extension officers trained2029: 50% of programs with gender/youth lens 2030: 40% youth and women participation achieved

The TARI-HIP is tightly aligned with the NHDS through a Results Alignment Matrix that turns strategic goals into measurable actions. The matrix maps NHDS targets to TARI-HIP interventions, indicators, and time-bound milestones, ensuring progress can be tracked, evaluated, and reported.

Key priorities such as reducing postharvest losses are operationalized through investments in seed systems, farmer training, and climate-smart technologies, with milestone targets of 15per cent reduction by 2027 and 30 per cent by 2030.

Beyond productivity, the framework integrates research, market access, governance, and gender/youth inclusion, creating a comprehensive performance compass that guides resource allocation, strengthens accountability, and supports adaptive management throughout 2025–2030.

CHAPTER FIVE FINANCIAL ARCHITECTURE AND RESOURCE MOBILIZATION

5.1 Estimated Investment Requirements by Strategic Pillar

The TARI-HIP establishes a structured and transparent investment framework to ensure financial credibility, strategic coherence, and alignment with national and international financing systems. Using a rigorous activity-based costing (ABC) and bottom-up budgeting approach, the Plan disaggregates investment needs across its eight strategic pillars, classifying expenditures into four categories:

i Capital Investments - One-time expenditures for infrastructure, labs, irrigation systems, seed facilities, and climate-smart technologies.
ii Operational Costs - Recurrent expenditures for training, extension, adaptive trials, logistics, and data collection.
iii Institutional Strengthening - Support for governance reforms, policy frameworks, coordination mechanisms, and regulatory compliance.
iv Knowledge Management - Investments in data systems, digital platforms, documentation, and feedback mechanisms to reinforce evidence-based planning.

The TARI-HIP adopts a results-based, MTEF-aligned financing framework that directs resources to priority interventions, strengthens transparency by linking inputs to measurable outputs, and ensures systemic coherence with FYDP III, ASDP-II, CAADP, and Agenda 2063. Its costing draws from TARI's historical spending, ASDP-II benchmarks, and regional cost norms, validated through technical and financial peer review.
The result is a fiscally sustainable, blended financing roadmap combining public, donor, and private funds that assures stakeholders every shilling is transparent, traceable, and tied to impact.

5.2 Public Sector Financing Commitments and Opportunities

The TARI-HIP is built on a resilient public financing framework, leveraging ASDP-II, MoA and PO-RALG votes, and MTEF commitments as the fiscal backbone for horticultural transformation. These allocations fund core areas of infrastructure, extension, and land-use services while signalling a strong political commitment.
Aligning with FYDP III, ASDP-II, and LGDGs, the TARI-HIP ensures vertical coherence between central and local levels, enabling resource pooling and harmonized planning. The Plan shifts from fragmented line-item budgeting to integrated, results-oriented financing, embedding horticulture in rural development and food systems resilience frameworks.
Through MTEF-linked commitments and inter-ministerial coordination, public finance becomes both a fiduciary anchor and a lever for blended investment, enhancing predictability, accountability, and donor confidence while attracting development partners, climate finance, and private capital.

5.3 Expenditure Framework

The TARI-HIP has been costed at a total of **TZS 52,946,800,000** over the 2025–2030 implementation period, distributed across the eight strategic pillars. To enhance financial accountability and traceability, the resource envelope is categorized by salaries, operational costs, and capital investments, each mapped to the relevant pillars and TARI centres/sub-centres.

Table 7 presents the summarized expenditure framework. This high-level breakdown illustrates how funds are distributed institutionally and programmatically, while the fully disaggregated financial framework by pillar, expenditure type, and TARI centre/sub-centre

Table 7: **Summary of TARI-HIP Expenditure Framework by Pillar and TARI Centre/Sub-Centre (2025–2030)**

Expenditure Category	Pillars Covered	TARI Centres/Sub-Centres	Total Allocation (TZS bn)	% of Total TARI-HIP Budget
Salaries	P1–P8 (Seed Systems, Climate-Resilient Varieties, Post-Harvest, Infrastructure, Extension & Digital Platforms, Export Markets, Gender & Youth, Institutional Capacity)	Dakawa, Uyole, Makutupora, Mlingano, Kifyulilo, Tengeru, HQ	7.0	12.5%
Operational	P1–P8 (same as above)	Dakawa, Uyole, Makutupora, Mlingano, Kifyulilo, Tengeru, HQ	16.4	29.3%
Capital	P1–P8 (same as above)	Dakawa, Uyole, Makutupora, Mlingano, Kifyulilo, Tengeru,, HQ	32.5	58.2%
Total	—	—	**55.9**	**100%**

This framework confirms that TARI-HIP resources are directly tied to TARI institutional architecture, ensuring that financial allocations are both strategically aligned with the eight pillars and anchored within specific centres and sub-centres for accountability. Salaries guarantee skilled human resources, operational budgets sustain core research and extension functions, while capital investments fund critical infrastructure such as pack houses, irrigation systems, and laboratories.

5.4 Role of Private Sector and Commercial Capital

The TARI-HIP places the private sector at the centre of horticultural transformation, recognizing that public finance alone is insufficient. Agribusinesses input suppliers, irrigation firms, logistics providers, and processors are positioned as engines of value creation, innovation, and scale across the value chain.

Strategic entry points include contract farming, cold chain infrastructure, efficient irrigation, improved seed systems, and value-added processing. To attract investment, the TARI-HIP deploys de-risking mechanisms such as blended finance, credit guarantees, and viability gap funding, improving the risk–return profile of projects.

Public–Private Partnerships (PPPs) are prioritized for infrastructure components pack houses, storage, and market hubs with safeguards on risk-sharing, performance contracts, and transparency. Also by aligning commercial viability with inclusivity and sustainability, the TARI-HIP builds an investable pipeline that delivers dual returns: profitability for investors and systemic transformation of Tanzania's agri-food systems.

5.5 MTEF Integration and Budget Codes

To ensure that TARI-HIP is not implemented as a parallel initiative but as an integral component of Tanzania national budgeting framework, its financing has been explicitly aligned with the MTEF under the TARI budget vote. Each TARI-HIP pillar is mapped to the relevant Strategic Objectives (III–VII) of the TARI Strategic Plan 2025–2030, and costed across standard government expenditure as presented in Table 8. This alignment guarantees that TARI-HIP activities are programmed, budgeted, and reported through the Integrated Financial Management Information System (IFMIS), subject to the fiscal discipline, oversight, and audit protocols of the Government of Tanzania public financial management system. Table 8 illustrates the indicative mapping of TARI-HIP interventions to TARI Strategic Objectives, MTEF budget codes, and projected allocations for FY2025–2030.

Table 8: **MTEF Alignment Table for TARI-HIP (2025–2030)**

TARI-HIP Pillar	**Linked TARI SP 2025–2030 Objective (III–VII)**	**MTEF Budget Code (Illustrative)**	**FY2025–2030 Indicative Allocation (TZS Billion)**
Pillar 1: Enhancing Sustainable Horticultural Productivity	Objective III: Increase the development of demand-driven climate-smart technologies, innovations and practices for accelerating agricultural growth	The budget codes aligned with Objective III include C01S, C02S, C03S, C04S, C05S, and C06S,	4,397,000,000
Pillar 2: Strengthening Research and Innovation Capacity	Objective III & VII: Strengthen institutional R&D capacity and knowledge management	The budget codes aligned with Objective III include C01S, C02S, C03S, C04S, C05S, and C06S, whereas the budget codes aligned with Objective VII comprise G01C, G02C, G03C, G04C, G05C, and G06C.	19,430,000,000
Pillar 3: Improving Post-Harvest Management and Value Addition	Objective V: Promote socio-economic, policy, gender, market and trade research for evidence-based policymaking	The budget codes aligned with Objective V include E01S, E02S, E03S, E04S, and E05S.	4,245,000,000
Pillar 4: Revitalizing Seed Systems and Planting Materials	Objective III: Increase development of climate-smart technologies and resilient seed systems	The budget codes aligned with Objective III include C01S, C02S, C03S, C04S, C05S, and C06S,	5,205,000,000
Pillar 5: Extension, Knowledge & Advisory Systems	Objective IV: Improve multi-stakeholder collaboration and partnerships that promote adoption of technologies	The budget codes aligned with Objective IV include D01S and D02S.	6,067,000,000.

Pillar 6: Climate Resilience and Sustainability	Objective III & IV: Increase CSA adoption and strengthen adaptation to climate risks	The budget codes aligned with Objective III include C01S, C02S, C03S, C04S, C05S, and C06S, whereas the budget codes aligned with Objective IV comprise D01S and D02S.	5,860,500,000
Pillar 7: Policy Coherence and Institutional Coordination	Objective V & VI: Policy research, institutional capacity and resource mobilization	The budget codes aligned with Objective V include E01S, E02S, E03S, E04S, and E05S, whereas the budget codes aligned with Objective VI include F01C, F02C, and F03C."	4,150,000,000
Pillar 8: Gender Equity and Youth Inclusion	Objective V & VII: Mainstream gender and youth; strengthen institutional knowledge	The budget codes aligned with Objective V include E01S, E02S, E03S, E04S, and E05S. whereas the budget codes aligned with Objective VII include G03C, G04C, and G05C.	3,592,300,000
Total TARIHIP Budget (2025–2030)	—	—	**52,946,800,000**

This MTEF alignment ensures that, TARI-HIP financial flows are not only transparent and traceable, but also verifiable against national budget lines and performance targets. Also, by embedding TARI-HIP investments within the TARI budget vote and reporting them through IFMIS, the plan provides a reliable basis for DLI verification and strengthens fiduciary assurance for development partners. This integration reduces transaction costs, enhances predictability of financing, and builds confidence among both government and external stakeholders that horticulture research investments are firmly anchored within Tanzania's medium-term fiscal framework.

5.6 Blended Finance and Innovative Instruments

TARI-HIP addresses financing gaps by deploying blended finance mechanisms and innovative financial instruments to attract catalytic capital into horticulture. Aligning public, philanthropic, and commercial resources within a risk-sharing framework, the Plan recalibrates risk–return profiles and incentivizes investment in areas underserved by traditional markets.

Key instruments include Results-Based Financing (RBF) tied to validated milestones, climate adaptation finance to de-risk climate-sensitive projects, and green financing facilities to support sustainable technologies. Additional channels diaspora bonds, philanthropic endowments, ESG-focused concessional debt, and structured investment vehicles will expand the pool of investable resources.

These instruments are embedded in a broader capital layering model, leveraging public allocations to crowd-in private finance and recycling funds for sustained impact. Fiduciary controls and eligibility protocols ensure accountability and alignment with investor expectations. Moving beyond grant dependency, TARI-HIP builds a future-proof investment ecosystem that is inclusive, climate-resilient, and commercially viable, positioning horticulture as a long-term growth sector for Tanzania.

5.7 Development Partner Contributions and Donor Alignment

TARI-HIP success depends on a strong collaboration with bilateral and multilateral development partners, who provide financing. technical expertise. and institutional support. Tanzania's horticultural transformation aligns with global agendas on climate adaptation, food systems resilience, inclusive growth, and gender equality, positioning TARI-HIP within such frameworks as CAADP, the World Bank Food Systems 2030, USAID Feed the Future, the EU Green Deal, IFAD, GCF, FAO, and AfDB.

To ensure efficiency and coherence, TARI-HIP promotes coordinated financing modalities, including pooled funds, basket financing, co-financing agreements, and programmatic support tied to shared monitoring frameworks. Partner resources will be integrated into national systems (MTEF, ASDP-II, public investment strategies) and tracked against performance benchmarks to guarantee accountability and results.

Beyond financing, TARI-HIP establishes a structured platform for policy dialogue and joint programming between the Government of Tanzania and development partners. This architecture fosters mutual accountability, harmonization, and donor alignment; reduces transaction costs; and delivers value-for-money outcomes. Embedding donor contributions in national systems, the TARI-HIP positions horticulture as a strategic priority for international cooperation, building of a resilient, inclusive, and market-oriented sector that is globally competitive and locally transformative.

5.8 Financial Governance and Accountability Mechanisms

TARI-HIP is anchored in robust financial governance, ensuring fiduciary credibility, stakeholder trust, and performance assurance. Guided by Public Financial Management (PFM) principles, transparency, accountability, and value for money, all financial flows will be managed through Tanzania's Integrated Financial Management Information System (IFMIS), which are fully aligned with the MTEF and national budget processes.

Oversight mechanisms include routine expenditure tracking, quarterly financial reports, digital dashboards, and independent audits, which are conducted in accordance with CAG standards, supplemented by internal audits and donor fiduciary agents. Results-based disbursements will tie funding to validated outputs and performance benchmarks, strengthening expenditure discipline.

TARI-HIP will institutionalize SOPs, risk mitigation protocols, compliance tools, and budget deviation analyses, while building the capacity of TARI Finance Officers, implementing partners, and LGAs. Together, these measures establish a transparent, efficient, and performance-driven financial ecosystem, safeguarding resources, enabling adaptive learning, and ensuring every shilling delivers measurable results.

CHAPTER SIX

INSTITUTIONAL AND IMPLEMENTATION ARRANGEMENTS

6.1 Institutional Leadership and Strategic Oversight

TARI assumes the lead role in implementing TARI-HIP, which is grounded in its statutory mandate as Tanzania's national authority for agricultural research and innovation. As the principal convener, TARI integrates policy, research, extension, and investment domains, ensuring sector-wide transformation in horticulture.

Through its 17 zoned research centres, TARI combines national coordination with regional responsiveness, enabling both centralized policy anchoring and localized delivery. Dedicated Directorates for Research, Planning, Finance, and knowledge management provide structural capacity to operationalize multi-year investments under results-based management (RBM).

Strong governance systems, including the Board of Directors, Technical Working Groups (TWGs), and RBM mechanisms, safeguard fiduciary integrity, accountability, and adaptive learning. Together, these institutional arrangements position TARI as the engine of TARI-HIP delivery, which is capable of translating strategy into measurable outcomes and driving horticulture's transformation agenda.

6.2 Inter-Ministerial and Cross-Sectoral Collaboration

TARI-HIP recognizes that horticulture transformation cannot be achieved through siloed efforts, but it requires a whole-of-government approach that integrates policy, finance, trade, land governance, and infrastructure. Thus, the Plan establishes a formal inter-ministerial coordination platform that leverages the mandates of key ministries. The Ministry of Agriculture (MoA) will provide policy stewardship, ensuring the alignment with ASDP-II and related strategies. The Ministry of Finance (MoF) will secure fiscal integration through the MTEF and mobilize complementary resources. The President's Office – Regional Administration and Local Government (PO-RALG) will harmonize policies and implementation at the subnational level. At the same time, the Ministry of Industry and Trade (MIT) will lead efforts on value addition, standards, and market integration.

This framework is embedded into TARI-HIP governance through joint planning calendars, coordinated budget submissions, and formal terms of reference. These mechanisms strengthen joint accountability, reduce duplication, and enhance coherence across national planning instruments, including FYDP III, ASDP-II, NHDS, and the Agricultural Research Master Plan. For development partners, this architecture ensures that resources flow through a disciplined, coordinated, and accountable system, thereby maximizing value for money and ensuring that investments in horticulture contribute directly to Tanzania's broader development priorities.

6.3 Role of Local Government Authorities (LGAs)

As the frontline agents of delivery, Local Government Authorities (LGAs) are pivotal in translating the TARI-HIP strategic intent into tangible results on the ground. Their mandate includes land-use planning, farmer mobilization, the delivery of extension services, and maintenance of local horticultural infrastructure. To enable effective execution, targeted capacity-building initiatives, digital tools, and performance-linked resourcing will be deployed. The coordination with PO-RALG and TARI will ensure that decentralized implementation remains consistent with national standards while responsive to local realities.

6.4 Private Sector and Non-State Actor Engagement

TARI-HIP is deliberately structured to crowd in private capital, entrepreneurial capability, and civic engagement. Private firms, producer associations, civil society organizations (CSOs), and development partners will be systematically engaged as co-investors, innovation partners, and service providers. Mechanisms such as structured public-private dialogue platforms, co-financing windows, and inclusive policy forums will be established to foster collaboration, share risk, and amplify impact. Special attention will be paid to integrating women and youth-led enterprises into value chain development and service delivery.

6.5 Governance Structures and Technical Working Groups

TARI-HIP is guided by a three-tier governance framework that combines strategic oversight, operational coordination, and technical rigor. At the apex, the National Steering Committee (NSC), chaired by the Ministry of Agriculture and comprising key ministries, development partners, and private sector actors, provides strategic direction, approves reforms, and ensures the alignment with ASDP-II and FYDP III.

The Investment Plan Secretariat, embedded within TARI, serves as the operational hub, overseeing daily coordination, stakeholder engagement, implementation reviews, and reporting. At the technical level, Thematic Technical Working Groups (TWGs) are established for each of the eight TARI-HIP pillars, bringing together experts from TARI, the academia, ministries, the private sector, and civil society to ensure technical rigor, adaptive learning, and innovation.

All governance bodies operate under formal Terms of Reference (ToRs) that clearly define their mandates, establish feedback loops, and set performance benchmarks, thereby ensuring transparency and accountability. This tiered governance system positions TARI-HIP as a dynamic, results-based platform, which is capable of delivering horticultural transformation with both strategic vision and technical excellence.

6.6 Delivery Mechanisms and Operational Workflows

The TARI-HIP delivery model is built on structured processes, institutional accountability, and international implementation standards, ensuring interventions are executed efficiently, promptly, and are results-oriented. A systems-based workflow governs the whole project cycle, annual planning, budgeting, procurement, field execution, monitoring, quality assurance, and adaptive learning, which are designed to be scalable, auditable, and context-responsive.

The delivery is reinforced through Standard Operating Procedures (SOPs), results-based implementation manuals, and digital workflow systems. These include planning dashboards, procurement trackers, and real-time data platforms, all of which are integrated with national data systems and are aligned with the TARI-HIP's MEL framework. Together, they enhance traceability, transparency, and evidence-based supervision.

Operational workflows are synchronized with national budget cycles and supported by capacity-building for TARI, LGAs, and partner institutions, ensuring compliance with fiduciary standards and strengthening delivery capability. This architecture guarantees that the TARI-HIP implementation is recurrent , measurable, and performance-driven, positioning it as a credible platform for mobilizing and managing investment at scale.

6.7 Accountability and Transparency

TARI-HIP embeds a comprehensive accountability and transparency framework to safeguard fiduciary integrity, stakeholder trust, and performance credibility. Built on public financial management standards, the framework combines multi-layered oversight with participatory monitoring to ensure compliance and responsiveness.

Independent financial and performance audits, supported by real-time expenditure tracking systems, will verify adherence to budget, procurement, and program targets. To reinforce social accountability, the Plan institutionalizes participatory performance reviews with farmer groups, civil society, and local government, alongside stakeholder scorecards to track responsiveness and delivery effectiveness. A Grievance Redress Mechanism (GRM) will ensure that complaints are transparent, traceable, and fairly resolved.

TARI will coordinate with the Controller and Auditor General (CAG), internal audits, and development partners to uphold anti-corruption safeguards and ensure alignment with international fiduciary standards. Periodic performance assessments will integrate empirical data and stakeholder feedback to drive mid-course corrections and strategic refinement.

This framework ensures TARI-HIP delivers measurable results that are financially responsible, socially inclusive, and ethically sound, reinforcing both public trust and investor confidence in Tanzania's horticultural transformation agenda.

CHAPTER SEVEN MONITORING, EVALUATION, AND LEARNING (MEL) PLAN

7.1 Purpose and Strategic Role of MEL in the Investment Plan

The MEL framework within TARI-HIP is not merely an administrative instrument it is a strategic lever for driving performance excellence, institutional accountability, and adaptive transformation. At its core, the MEL system is designed to generate credible evidence that informs real-time decision-making, supports iterative learning, and ensures that investments are aligned with intended outcomes and national priorities.

Rather than functioning solely as a compliance or reporting tool, the MEL framework is deliberately positioned as a catalytic mechanism for strategic foresight, enabling planners and implementers to anticipate implementation risks, recalibrate interventions, and allocate resources more efficiently. It embeds a culture of results-based management and continuous improvement, empowering implementing entities, including TARI, sector ministries, local governments, and private partners, to translate data into actionable insights and insights into measurable change.

Furthermore, the MEL system will anchor upward and downward accountability across the investment landscape. It will support transparent reporting to development partners and government authorities, while also strengthening citizen oversight and stakeholder trust. Integrating learning processes into the implementation cycle, the MEL framework ultimately functions as a dynamic governance tool, enhancing the effectiveness, efficiency, and sustainability of horticultural transformation in Tanzania.

7.2 Results Framework and Theory of Change Linkages

At the heart of the TARI-HIP MEL system lies a coherent and strategically aligned results framework that operationalizes the Plan Theory of Change. This framework delineates the logical pathway from resource inputs and planned activities, through measurable outputs and intermediate outcomes, to the long-term impact: the transformation of Tanzania horticulture sector into a resilient, inclusive, and innovation-driven engine of growth.

The Results Framework, presented in Annex 1, structures this pathway using a tiered set of indicators aligned with each strategic pillar and intervention area. It enables rigorous tracking of implementation progress and sectoral transformation, supported by clearly defined baselines, annual targets, and verification mechanisms.

Critically, the results framework is tightly linked to the Plan Theory of Change, as illustrated in Figure 1, Section 3.3. This ensures that the MEL system is technically robust and conceptually coherent, providing a shared reference point for all stakeholders to assess causal relationships, evaluate effectiveness, and guide strategic learning.

Together, these tools enable the MEL system to serve not merely as a compliance mechanism but as an integrated platform for results-based planning, adaptive management, and policy refinement. Anchoring each intervention within a clear logic model and measurable performance structure, the Plan enhances transparency, accountability, and impact assurance across the entire implementation lifecycle.

7.3 Indicators, Baselines, and Performance Targets

The effective operationalization of the TARI-HIP MEL system hinges on a robust indicator framework that enables evidence-based tracking of progress, performance, and impact. The Plan utilizes a comprehensive set of indicators, encompassing quantitative and qualitative measures, that span all levels of the results hierarchy, from inputs and outputs to outcomes and long-term impacts.

During execution, each indicator has a baseline, yearly targets, reliable data sources, and a set of reporting times. This makes sure the process stays consistent, transparent, and accountable. The indicators are linked to the Plan's eight main pillars and follow the results framework in Annex 1.

To promote inclusive and equitable development outcomes, indicators will be disaggregated by gender, youth, and geographic location, enabling nuanced analysis of differentiated impacts and equity-focused reporting. This ensures that the MEL system captures aggregate progress and the distributional effects of interventions across various socio-demographic groups.

Moreover, the frequency of data collection has been tailored to each indicator, with timelines harmonized with national planning, budgeting, and reporting cycles. Where possible, indicators will draw upon the existing administrative datasets and sectoral information systems, complemented by periodic field verification and third-party assessments to enhance objectivity and data credibility.

Together, this structured indicator framework provides a technically sound and policy-responsive foundation for performance management, enabling timely course correction, strategic learning, and results-based reporting to stakeholders and development partners.

7.4 Data Collection, Verification, and Quality Assurance Mechanisms

A credible and responsive MEL system requires a rigorous data architecture that ensures accuracy, reliability, and timeliness. In this regard, TARI-HIP adopts a multifaceted approach to generate and validate data, integrating traditional and modern methodologies to support comprehensive performance tracking and decision-making.

Data will be sourced from a combination of administrative records, field-based surveys, digital monitoring platforms, and independent third-party assessments. These complementary sources will provide quantitative and qualitative insights across the results chain, with digital tools enhancing real-time reporting, geospatial tracking, and automated aggregation for improved efficiency and coverage.

During the execution, all data collection activities will be governed by standardized protocols, ensuring methodological consistency across regions and institutions. Special emphasis is placed on the institutionalization of data verification procedures, including spot checks, audit trails, and triangulation methods to validate reported results and mitigate risks of misreporting or data inflation.

In parallel, a structured Data Quality Review (DQR) system will be operationalized to assess each dataset against key quality dimensions: accuracy, completeness, timeliness, and consistency. These reviews will be conducted periodically and embedded within implementation workflows to enable timely corrective actions and continuous improvement.

To support metadata standardization and institutional interoperability, all indicators will be accompanied by clearly defined metadata sheets that outline definitions, calculation methods, data sources, collection frequencies, and disaggregation requirements. These standards will be harmonized with national data ecosystems and aligned with sectoral and donor reporting requirements to reduce duplication and enhance comparability.

7.5 Feedback Loops, Learning Mechanisms, and Knowledge Translation

The TARI-HIP MEL system goes beyond data collection, embedding feedback loops and knowledge translation to ensure evidence drives decision-making, adaptation, and program refinement. A dynamic learning agenda, guided by strategic learning questions, aligns directly with the pillars of the Plan and transformation pathways.

Learning will be generated through routine reviews, pause-and-reflect sessions, after-action reviews, and stakeholder consultations, creating structured opportunities to identify what works, what does not, and why. Evidence will be synthesized and shared with implementers, policymakers, and partners through learning briefs, policy summaries, dashboards, and infographics, ensuring usability and impact.

These mechanisms will strengthen institutional memory, support cross-sector dialogue, and elevate good practices to the national policy arena. Crucially, lessons will be reintegrated into planning, budgeting, and financing cycles, creating an iterative process of evidence, reflection, and course correction. This positions the MEL system as a catalyst for adaptive management, innovation, and accountability, ensuring that TARI-HIP remains responsive, efficient, and impactful.

7.6 Adaptive Management and Real-Time Decision Support

The TARI-HIP MEL system is structured to enable adaptive management, ensuring that, the delivery remains responsive in an evolving policy and implementation environment. By combining systematic data analysis with field intelligence, the system identifies bottlenecks, underperformance, and emerging risks, translating evidence into real-time performance dashboards for decision-makers.

The execution will be supported by decision-support tools such as traffic light reporting, deviation alerts, and scenario-based analysis, integrated into planning cycles and linked to Technical Working Groups and Steering Committees. These mechanisms ensure that, data trigger timely action and resource reallocation rather than passive observation.

Risk monitoring protocols covering fiscal, operational, environmental, and institutional risks will align with broader risk mitigation strategies of TARI-HIP, enabling proactive responses to safeguard delivery. In parallel, feedback loops from Field Agents, Extension Officers, and community stakeholders will ensure that national steering is grounded in local realities. Together, these mechanisms position the MEL system as a real-time decision engine, reinforcing responsiveness, accountability, and impact.

7.7 Institutional Arrangements for MEL Implementation

The TARI-HIP MEL system is anchored in a clear institutional framework that defines roles, responsibilities, and reporting relationships to ensure rigor, accountability, and alignment with national systems. TARI, through its Directorate of Planning, Monitoring, and Evaluation, will serve as the institutional anchor overseeing MEL design and execution, ensuring data quality, and coordinating knowledge integration across research centres and partners.

Complementary roles will be played by the Ministry of Agriculture (MoA), Ministry of Finance (MoF), and PO-RALG, embedding TARI-HIP indicators into national performance systems (PlanRep, MUSE, ASDP-II M&E) and supporting cross-sectoral learning. Local Government Authorities (LGAs) will act as front-line data generators, tracking outputs and convening participatory review forums, with capacity building provided to strengthen their use of digital data capture and indicator tracking.

Independent verification agents, academic institutions, research organizations, or third-party consultants will periodically validate reported results, ensuring transparency and donor confidence. To sustain performance, targeted capacity development in results-based management, digital tools, and policy translation will be provided to MEL focal points. Regular coordination mechanisms, MEL technical working groups, quarterly reviews, and annual learning summits will institutionalize collaboration and continuous improvement.

Finally, the MEL architecture will be integrated with national and donor reporting frameworks, reducing duplication and facilitating evidence-based dialogue with development partners, financiers, and the public. This ensures that the MEL system of TARI-HIP is technically robust, credible, transparent, and trusted at all levels.

7.8 Results-Based Reporting and Accountability to Stakeholders

TARI-HIP embeds a results-based reporting framework that goes beyond compliance, using reporting as a tool for learning, dialogue, and accountability across government, partners, and the public. Semi-annual updates, annual reports, and stakeholder reviews will track progress, flag risks, and guide course corrections, with outputs integrated into PlanRep, MUSE, and ASDP-II dashboards for coherence and efficiency. Complementary briefs, infographics, and review forums ensure that, findings are accessible, validated, and acted upon, thus, strengthening trust, sustaining financing, and driving continuous improvement in horticultural transformation.

CHAPTER EIGHT RISK ASSESSMENT AND MITIGATION MEASURES

8.1 Purpose and Risk Management

TARI-HIP treats risk management not as compliance but as a strategic imperative to safeguard investments, ensure delivery continuity, and reinforce institutional resilience. Recognizing that financial, climatic, operational, and institutional volatility are inherent in complex programs, the Plan adopts a proactive posture: identifying, analysing, and mitigating risks before they materialize.

Risk management is embedded in results-based planning, enabling an early detection of warning signs, agile responses, and the recalibration of interventions without disrupting progress. Tools include scenario planning, fiscal safeguards, governance controls, and environmental scanning, ensuring risk mitigation is systematic, data-driven, and integrated across decision-making levels.

Mainstreaming risk intelligence into governance and delivery systems, TARI-HIP protects both financial and developmental returns, while enhancing stakeholder confidence, transparency, and sustainability. This positions risk management as a core pillar of execution, which is essential to delivering long-term transformation in Tanzania's horticulture sector.

8.2 Risk Categorization Framework

A sound risk management system begins with a disciplined framework for identifying, classifying, and prioritizing risks. Within TARI-HIP, risks are assessed by their probability of occurrence, the severity of their potential impact, and the speed at which they could materialize, commonly referred to as risk velocity.

The categorization framework applied in TARI-HIP is rooted in global best practices and adapted to the operational realities of the Tanzanian horticulture sector. It classifies risks across five thematic domains:

i Strategic risks that may affect the achievement of long-term objectives due to shifts in policy, sectoral priorities, or geopolitical dynamics.

ii Operational risks that arise from inefficiencies or disruptions in delivery mechanisms, procurement processes, or human resource systems.

iii Financial risks that include budget shortfalls, cost overruns, currency fluctuations, and delays in the disbursement of funds.

iv Environmental risks, including extreme weather events, pest outbreaks, and climate-induced shocks, posing a threat to productivity and infrastructure.

v Institutional risks that encompass weaknesses in coordination, governance, or institutional capacity that could erode the effectiveness of implementation.

Each identified risk is evaluated based on three parameters: (i) the likelihood of occurrence, (ii) severity of the impact on TARI-HIP outcomes, and (iii) velocity, or the time in which the risk could disrupt implementation if unaddressed. This structured approach enables TARI and its partners to prioritize mitigation efforts, allocate resources efficiently, and maintain an adaptive posture throughout the Plan lifecycle.

8.3 Strategic and Policy Risks

At the macro level, the success of TARI-HIP is contingent on the stability and consistency of the broader policy and governance environment. Strategic and policy risks, as presented in Table 9, refer to systemic threats that can undermine long-term coherence, disrupt intersectoral alignment, or erode institutional momentum.

Key risks in this domain include policy reversals, driven by shifts in political leadership or fiscal reprioritization; weak inter-ministerial coordination, which may fragment implementation efforts; and limited high-level political buy-in, which could dilute the visibility and prioritization of horticulture in national development agendas. Additionally, uncertainties in regional trade policies, regulatory frameworks, or agricultural subsidy regimes could adversely affect the enabling environment for horticultural transformation.

To address these risks, TARI-HIP integrates forward-looking mitigation strategies that are both structural and adaptive. These include the institutionalization of policy dialogue platforms to foster continuous engagement between ministries, development partners, and sectoral actors; the establishment of legal and regulatory safeguards that anchor the Plan objectives in binding instruments; and the activation of high-level steering mechanisms, such as, the National Steering Committee to ensure sustained policy alignment, troubleshoot cross-sectoral bottlenecks, and protect the implementation continuity across political cycles.

Furthermore, embedding TARI-HIP within national frameworks such as FYDP III, ASDP-II, and CAADP-aligned strategies, the Plan enhances its resilience to policy volatility and anchors its relevance within the broader developmental agenda. These measures collectively ensure that TARI-HIP remains insulated from political risk, is strategically positioned for longevity, and is aligned with Tanzania's long-term agricultural transformation goals.

Table 9: **Strategic and Policy Risks**

Risk Category	Description of Risk	Mitigation Strategy
Policy Reversals	Shifts in political leadership or national priorities may lead to the downgrading or discontinuation of horticulture investments.	Embed TARI-HIP in long-term national plans (FYDP III, ASDP-II); Secure Cabinet-level endorsement; Institutionalize legal and regulatory frameworks.
Weak Inter-Ministerial Coordination	Fragmentation in planning, budgeting, and implementation among key ministries can lead to misalignment.	Establish a National Steering Committee; operationalize inter-ministerial working groups; and develop joint annual work plans.
Limited Political Commitment	Lack of high-level political will could weaken resource allocation and stakeholder engagement.	Policy dialogue with senior officials; Evidence-based reports; Engage political champions.
Regulatory and Trade Policy Uncertainty	Unpredictable trade tariffs or policy changes may disrupt market systems.	Engage with MoA and MIT in harmonization; conduct policy impact assessments; and create private sector feedback loops.
Inconsistent Sectoral Prioritization	Competing public investment priorities may side line horticulture.	Evidence-based advocacy: Link TARI-HIP with national food security and integrate TARI-HIP indicators into national monitoring.

8.4 Operational and Delivery Risks

Operational and delivery risks pertain to institutional, logistical, and technical challenges that may hinder the timely and effective execution of TARI-HIP interventions. These risks manifest in various forms, including delayed procurement cycles, weak subnational implementation capacity, institutional fragmentation, and disruptions in input supply chains. If unmitigated, these challenges can result in cost overruns, implementation delays, and diminished outcomes at the beneficiary level.

Key bottlenecks include insufficient coordination across implementing agencies, inconsistencies in Standard Operating Procedures (SOPs), limited use of digital planning tools, and inadequate readiness of Local Government Authorities (LGAs) to absorb and manage programmatic resources. Additionally, capacity gaps in field-level supervision, logistics management, and adaptive delivery further exacerbate these risks.

In response, the Plan adopts a suite of mitigation strategies anchored in operational resilience. These include: (i) strengthening the annual planning and work plan synchronization across executing entities; (ii) deploying digital project management and procurement tracking systems to improve real-time oversight; (iii) enhancing the operational readiness of LGAs through tailored training, technical backstopping, and resource alignment; and (iv) establishing rapid response protocols to address unforeseen supply chain or implementation disruptions.

A comprehensive categorization of these risks and their mitigation responses is provided in Table 10. Through these measures, TARI-HIP aims to enhance delivery efficiency, reduce transaction costs, and safeguard the timely achievement of its strategic objectives.

Table 10: **Operational Risks**

Risk Category	Description of Risk	Mitigation Strategy
Procurement Delays	Lengthy or non-transparent procurement processes may delay implementation.	Develop SOPs; Use e-GP systems; Build procurement capacity.
Human Resource Gaps	Shortage or low retention of technical staff may limit execution.	Capacity-building plans, Contract-based recruitment, and Partner with universities.
Coordination Failures	Weak alignment may lead to duplication or missed opportunities for synergy.	Technical coordination meetings, clarifying roles, and coordination dashboards.
Low Absorptive Capacity	Inability of LGAs to absorb funds may delay execution.	Phased funding, Targeted training, Monitor absorption rates.
Weak Data Systems	Inconsistent data may hinder monitoring and evaluation.	Strengthen digital M&E; standardize tools; conduct routine data audits.

8.5 Financial and Fiduciary Risks

Financial and fiduciary risks represent a critical dimension of implementation vulnerability within TARI-HIP, as they directly affect the availability, flow, and accountability of resources needed to sustain the execution. These risks include budgetary shortfalls, delays in disbursements, cost overruns due to inflation or planning errors, exchange rate volatility, and fiduciary breaches such as financial mismanagement or fraud. If left unaddressed, these challenges may lead to under implementation, reputational risks, and a loss of stakeholder confidence.

A particular concern is the unpredictability of donor funding flows and the potential misalignment between planned disbursements and the actual cash flow timing. Additionally, weaknesses in financial controls, limited fiscal buffers, and capacity constraints at implementing entities may further compromise financial discipline.

To mitigate these risks, TARI-HIP proposes a comprehensive risk management strategy that includes: (i) diversified and blended resource mobilization strategies to reduce dependency on a single funding source; (ii) the adoption of results-based financing instruments to strengthen accountability and link disbursement to verified outputs; (iii) the establishment of contingency provisions within the financial plan to cushion against macroeconomic shocks and cost escalation; and (iv) the reinforcement of financial management systems through enhanced internal controls, the use of Integrated Financial Management Information Systems (IFMIS), and periodic fiduciary audits.
A detailed categorization of financial risks and associated mitigation measures is presented in Table 11.These safeguards are designed to promote fiduciary integrity, ensure predictability of funding flows, and uphold the Plan financial credibility throughout the implementation period.

Table 11: **Financial Risks**

Risk Category	Description of Risk	Mitigation Strategy
Budget Shortfalls	Funding may fall below projected levels.	Diversify sources, prioritize high-impact activities, and implement in phases.
Fund Disbursement Delays	Slow fund release may affect activity timelines.	Precise fund flow mechanisms, Quarterly schedules, Real-time tracking.
Cost Overruns	Costs may exceed the budget due to inflation or planning errors.	Include contingency margins, Update cost estimates, and Strong financial planning.
Exchange Rate Volatility	Currency depreciation may reduce fund value.	Hedging, Budget in local equivalents, Buffer allocations.
Weak Financial Controls	Poor oversight may lead to the misuse of funds.	Internal audits: Utilize IFMIS and Conduct Annual external audits.

8.6 Environmental and Climate Risks

Environmental and climate-related risks present significant systemic threats to the resilience and long-term viability of horticultural development in Tanzania. These risks include increased frequency and intensity of climate-induced shocks such as prolonged droughts, flash floods, pest and disease outbreaks, land degradation, and the erosion of agro-biodiversity. These phenomena undermine productivity, disrupt seasonal cropping patterns, and amplify vulnerabilities among smallholder producers.

Due to their ecological sensitivity and input intensity, Horticultural systems are particularly exposed to climate variability and environmental mismanagement. Unsustainable farming practices, overuse of agrochemicals, and encroachment into ecologically fragile zones further exacerbate ecological degradation and ecosystem stress.

To address these risks, TARI-HIP incorporates a proactive and integrative climate adaptation strategy. Key measures include: (i) mainstreaming climate-smart agricultural practices, including the deployment of drought and heat-tolerant horticultural varieties; (ii) promoting integrated water resource management systems such as small-scale irrigation and water harvesting; (iii) embedding agroecological principles in research, extension, and land-use planning; and (iv) strengthening early warning systems and pest surveillance mechanisms to enable anticipatory response.

These environmental safeguards are essential to ensure ecological sustainability of interventions, to reduce carbon and water footprint of horticultural production, and to build adaptive capacity across agro-ecological zones.

A detailed classification of risks and their mitigation strategies is presented in **Table 12.** The table serves as a planning and monitoring tool to embed environmental risk management across all levels of TARI-HIP implementation.

Table 12: Environmental Risks

Risk Category	Description of Risk	Mitigation Strategy
Climate Variability	Extreme weather events may affect productivity.	Climate-smart agriculture, irrigation, and early warning systems.
Pest and Disease Outbreaks	Crop losses from pests or diseases.	Pest surveillance, IPM; Research on resistant varieties.
Environmental Degradation	Unsustainable practices may degrade resources.	Regenerative practices; Safeguards, Impact assessments.
Agrochemical Misuse	Improper chemical use can harm both health and the environment.	Training, promoting organic inputs, and regulatory enforcement.
Resource Conflicts	Competition over resources may cause tensions.	Water-user associations, participatory planning, and conflict-sensitive programming.

8.7 Social and Stakeholder Risks

The successful implementation of TARI-HIP hinges not only on technical and financial robustness but also on its ability to manage social dynamics and stakeholder interests. Social and stakeholder risks stem from issues such as the exclusion of marginalized populations (including women, youth, and persons with disabilities), land tenure disputes, community resistance to new practices, and weak participatory mechanisms. These risks, if unaddressed, can erode trust, delay execution, and diminish the equity and sustainability of project outcomes.

Of particular concern are risks related to land use conflicts, which may arise from overlapping claims, unclear property rights, or competing interests between commercial investments and local livelihoods. Furthermore, the lack of effective communication and engagement with stakeholders, particularly at the grassroots level, can foster misconceptions, fuel opposition, and undermine program legitimacy.

To mitigate these risks, TARI-HIP promotes a suite of inclusive and participatory strategies. These include: (i) embedding stakeholder mapping and engagement protocols into program design; (ii) deploying gender-responsive and youth-sensitive outreach tools to ensure equitable participation; (iii) establishing community-level grievance redress mechanisms to address disputes transparently; and (iv) fostering social accountability through scorecards and citizen feedback platforms. These measures are designed to ensure that no group is left behind and that horticultural transformation is socially inclusive and locally owned.

A detailed typology of these risks and their mitigation strategies is presented in **Table 13.** This framework supports the integration of social safeguards, fosters community cohesion, and strengthens the legitimacy of TARI-HIP interventions across implementation geographies.

Table 13: **Institutional Risks**

Risk Category	Description of Risk	Mitigation Strategy
Weak Institutional Capacity	Limited ability to manage large-scale programs.	Strengthening plans; Technical assistance, Performance targets.
Governance Bottlenecks	Bureaucratic inertia may hinder implementation.	Clarify mandates, inter-agency groups, and accountability scorecards.
Limited Knowledge Integration	Weak use of evidence in decision-making.	Knowledge systems, MEL feedback loops; Training decision-makers.
Low Stakeholder Engagement	Inadequate consultation may weaken ownership.	Engagement frameworks: Participatory planning, Satisfaction tracking.
Leadership Turnover	Frequent changes may disrupt continuity.	Handover protocols, induction programs, and buy-in from leaders.

8.8 Risk Monitoring and Escalation Mechanisms

A critical feature of the TARI-HIP risk management architecture is the establishment of a dynamic, real-time risk monitoring and escalation system to ensure early detection, rapid response, and institutional agility. In the recognition that risks evolve throughout the implementation, the Plan integrates structured mechanisms for continuous risk tracking, thus, enabling proactive adjustments before threats materialize into disruptions.

Risk data will be systematically collected and analysed using digital dashboards embedded within the overall Monitoring, Evaluation, and Learning (MEL) system. These dashboards will flag deviations from the expected performance, aggregate early warning indicators, and visualize emerging risk patterns. They (dashboards) will be complemented by semi-annual implementation reviews, scenario-based planning exercises, and stakeholder feedback loops to triangulate risk signals from multiple sources.

To operationalize a timely response, a tiered risk escalation protocol will be instituted. Risks categorized as highly likely or as having high impact will trigger immediate alerts to the Investment Plan Secretariat and relevant Technical Working Groups. Institutional thresholds and pre-agreed response triggers will guide decision-making, ensuring that mitigation actions are timely, proportionate, and aligned with implementation priorities.

Additionally, adaptive planning mechanisms will be embedded to allow course corrections based on real-time risk assessments. These include budget reallocations, adjustments of activity timelines, re-targeting of interventions, and deployment of contingency reserves. Together, these systems aim to institutionalize a culture of anticipatory risk management, the one that is not only reactive but forward-looking, agile, and embedded across the entire TARI-HIP delivery chain.

8.9 Institutional Capacity for Risk Governance

Effective risk governance within TARI-HIP requires systems, protocols, institutional capacity, and accountability structures that are capable of sustaining a culture of proactive risk management. This section outlines the governance architecture and institutional arrangements that will anchor risk oversight, ensuring that, it is embedded across all levels of implementation.

TARI, as the lead executing agency, will designate a senior Risk Focal Point within its Investment Plan Secretariat to coordinate risk identification, mitigation, and reporting functions. This individual will act as the institutional custodian of the TARI-HIP risk governance agenda, supported by focal teams across regional research centres and partner institutions.

To operationalize risk governance, risk management responsibilities will be integrated into the terms of reference of Technical Working Groups (TWGs). Periodic risk updates will be tabled during National Steering Committee meetings to ensure executive-level oversight. These arrangements aim to embed risk intelligence in strategic planning, procurement, monitoring, and decision-making processes.

Capacity-building programs will be implemented to enhance technical competencies of staff and implementing partners in risk identification, scenario analysis, early warning interpretation, and contingency planning. These initiatives will leverage both in-country expertise and external technical assistance where necessary.

Furthermore, risk governance will be mainstreamed into performance audits, financial reviews, and implementation scorecards. This institutional anchoring ensures that risk is not treated as an isolated function but as a cross-cutting accountability dimension central to achieving TARI-HIP development outcomes.

ANNEXES

ANNEX I: DIAGNOSTIC REVIEW OF THE HORTICULTURE SECTOR

1. Horticultural Landscape in Tanzania

The horticulture sector stands at the forefront of Tanzania agricultural transformation, offering a unique combination of economic opportunity, social inclusion, and nutritional impact. Leveraging diverse agro-ecological zones and growing domestic and export markets, the sector has become one of the most dynamic contributors to rural livelihoods and national economic diversification. In 2024, total horticultural production was estimated at 7.5 million metric tons, a figure that underscores both progress achieved and the scale of unrealized potential.

The Tanzania Horticulture Development Strategy (NHDS 2021–2031) has set a bold national target of expanding production to 15 million metric tons by 2030. The TARI-HIP, embedded in TARI Strategic Plan (2025–2030), is designed as the institutional vehicle to deliver on this ambition. By prioritizing investments in improved seed systems, climate-resilient varieties, and adaptive technologies, the TARI-HIP seeks to close yield gaps, stabilize supply, and enhance resilience. This alignment ensures that horticultural development is not only consistent with national policy but also positioned as a catalyst for Tanzania's broader agricultural transformation.

2. Agro-Ecological Zoning and Geographic Distribution of Horticulture

The spatial configuration of horticultural production in Tanzania is intrinsically shaped by the country's diverse agro-ecological zones (AEZs), each defined by distinct bioclimatic parameters. Effective targeting of horticultural investments necessitates the geospatial alignment of crop selection, technology deployment, and infrastructure development with the ecological comparative advantages of each region.

As presented in Map 1, Tanzania is segmented into seven agro-ecological zones: The Northern Zone, Southern Highlands, Lake Zone, Coastal Belt, Central Zone, Western Zone, and the Southern Zone. Each zone represents a discrete production ecology, offering opportunities for crop diversification, value chain specialization, and investment clustering.

High-altitude volcanic soils, favorable agro-climatic conditions, and well-established market linkages characterize the Northern Zone (Arusha, Kilimanjaro, and Manyara). These factors render the zone optimal for high-value horticultural commodities, such as Irish potatoes, onions, tomatoes, and high-value vegetables (snow peas, fresh beans), as well as avocado, banana, and ginger, with a demonstrated comparative advantage in airfreighted exports to Europe and the Middle East.

The Southern Highlands (Mbeya, Njombe, Iringa, Ruvuma, Songwe, Katavi,) exhibit cool temperatures, deep loamy soils, and adequate rainfall, supporting intensive production of onion, tomatoes, irish potatoes, high valued vegetables, avocado, mangos, pineapples, banana, temperate fruits, ginger, garlic, cardamom, and vanilla This zone offers strong agro-enterprise potential, particularly for contract farming and domestic market aggregation.

The Southern Zone (Lindi and Mtwara) experiences a tropical coastal climate characterized by warm to hot temperatures, high humidity, and seasonal rainfall patterns. Rainfall is strongly seasonal, with the main rainy season (Masika) occurring from March to May and the short rains (Vuli) experienced from November to December. The dry season extents from June to October. This climate makes the zone suitable for cultivation of various crops including cashew, coconut, sesame, cassava, and tropical fruits.

The Lake Zone (Kagera, Mwanza, Mara, Geita) is endowed with a bimodal rainfall regime and fertile lacustrine soils, making it highly suitable for banana, pineapple, papaya, mango, tomato, chili, onion, and vanilla cultivars.

The zone proximity to transboundary markets (Uganda, Rwanda) strengthens its viability for cross-border trade and regional supply chain integration.

The Central Zone (Dodoma, Singida), characterized by semi-arid ecologies and erratic rainfall, is strategically positioned for the production of drought-adapted crops such as indigenous vegetables, guava, baobab, and spices (e.g., turmeric, ginger), onions, tomatoes, mangoes, grapes, coriander and chillies provided that targeted irrigation interventions and resilient seed systems are in place.

The Coastal Belt (Pwani, Morogoro, Tanga, Dar es Salaam) benefits from humid tropical conditions conducive to growing mangos, pineapples, citrus, bananas, ginger, cardamom, cloves, black pepper, Cinnamon, vanilla, and leafy vegetables. Its logistic proximity to port infrastructure, such as Dar es Salaam and Tanga ports, and dense consumer markets, such as Dar es Salaam, facilitates commercialization, processing, and export.

The Western Zone (Kigoma, Tabora) remains underexploited yet holds latent potential for avocados, mangoes, bananas, passion fruit, onions, tomatoes, Irish potatoes, okra, and ginger.

The geospatial profiling illustrated in Map 1 underpins a zone-specific investment strategy, enabling spatial prioritization of infrastructure (e.g., irrigation, cold chain and feeder roads), input distribution systems, and technology packages. This ecological mapping also informs adaptive extension approaches, climate-resilient varietal targeting, and territorial development planning.

3. Structure and Organization of Production Systems

The horticultural production landscape in Tanzania is stratified into three principal producer typologies: smallholder producers, emerging medium-scale growers, and commercial large-scale enterprises, each characterized by distinct resource profiles, technological capacities, and value chain integration modalities. The spatial distribution of these production systems, as illustrated in Map 1, closely corresponds to

Tanzania's agro-ecological zoning, informing ecological intensification, investment risk profiling, and infrastructure prioritization.

Smallholder farmers, who constitute approximately 85% of horticultural producers, typically operate on landholdings of less than two hectares. These producers engage predominantly in low-input production systems, relying on indigenous seed varieties, family labor, and rain-fed cultivation. Their market participation is mainly informal, with weak integration into structured value chains. While productivity levels remain sub-optimal, smallholders supply the bulk of fresh vegetables and fruits to domestic wet markets and peri-urban distribution centers, particularly within the Northern Highlands, Lake Zone, and Southern Highlands.

Medium-scale producers, ranging from 2 to 10 hectares, are increasingly entering the sector through contract farming, youth agribusiness models, and producer cooperatives. This segment employs semi-mechanized operations, improved seed varieties, and basic irrigation technologies (e.g., gravity-fed systems, low-pressure drip kits). With access to agronomic advisory services and aggregation platforms, they exhibit significant potential for upgrading into commercial value chains. Their geographic spread includes high-potential growth corridors in Morogoro, Dodoma, and Mbeya, often aligned with public-sector investment programs under ASDP-II and FYDP III.

Large-scale commercial horticulture enterprises are primarily export-oriented and capital-intensive. These firms utilize advanced production technologies such as automated fertigation, protected cultivation systems, and post-harvest cold chain logistics and comply with international market standards (Global G.A.P., HACCP and ISO 22000). They are concentrated in high-altitude zones of Arusha, Kilimanjaro, Njombe, Songwe, Mbeya, and Iringa, leveraging superior agro-climatic conditions and proximity to export logistics infrastructure (e.g., Kilimanjaro International Airport, Songwe Airport, Dar es Salaam Port and Airport). This segment drives foreign currency inflows, generates skilled employment, and fosters vertical value chain development.

Cropping systems across these producer categories vary. Smallholders favor mixed cropping and relay intercropping, often integrating vegetables with legumes or tubers to optimize food security and labor use. Commercial enterprises follow block farming and rotational monoculture models, aligned with phytosanitary protocols and supply contract specifications. These differences necessitate differentiated investments in extension services, land-use planning, and sustainable input delivery models.

Land tenure insecurity, particularly for women and youth, poses a significant constraint across all production levels. The predominance of customary tenure regimes, limited issuance of Certificates of Customary Rights of Occupancies (CCROs), and procedural barriers in land titling inhibit long-term private investment in irrigation, post-harvest facilities, and perennial crop systems. Policy reforms promoting joint titling, cooperative land leasing, and spatial land use digitization are crucial for addressing tenure-related constraints.

Gender dynamics within production systems reveal structural disparities. While women provide over 60% of labor in small-scale horticulture, their access to inputs, technology, and decision-making power remains disproportionately low. Youth participation is increasing, driven by digital extension services, climate-smart innovations, and startup incubation; however, systemic barriers in access to finance, land, and agribusiness training constrain broader youth integration.

4. Productivity, Yields, and Technology Adoption Gaps

The Tanzanian horticulture sector remains structurally constrained by low productivity and wide yield gaps, which fundamentally limit competitiveness, scalability, and return on investment. Yield performance varies considerably across agro-ecological zones, crop types, and production systems, reflecting a significant underutilization of the country's agronomic potential. National average yields for key crops remain markedly below regional and international benchmarks: tomato yields average 8–10 tons per hectare, compared with 45–60

tons per hectare in Kenya and Morocco, and over 100 tons per hectare in protected environments. Onion productivity, at 12–15 tons per hectare, lags well behind South Africa and Egypt, where yields range between 25–35 tons per hectare. These disparities often exceeding 40–70 percent are symptomatic of constrained technology diffusion, weak varietal selection, and limited adoption of modern farm management practices.

A critical bottleneck lies in seed systems. More than 70 percent of smallholders rely on recycled or uncertified seed, eroding genetic gains and exposing crops to pests, diseases, and abiotic stressors. The supply chain for certified seed remains fragmented, with farmer uptake hampered by high input costs, weak last-mile distribution, and limited awareness, particularly in remote production corridors such as the Lake Zone and Western Highlands. This directly undermines the ability of the sector to scale climate-resilient and high-yielding varieties.

The agricultural extension ecosystem further compounds these constraints. Tanzania's ratio of extension officers to farmers stands at approximately 1:2,500, far below the optimal threshold for effective service delivery. This capacity deficit inhibits the dissemination of critical innovations, including Good Agricultural Practices (GAPs), Integrated Pest Management (IPM), and climate-smart intensification techniques. Consequently, the majority of smallholders remain excluded from the technological frontier, perpetuating low productivity and vulnerability to shocks.

Post-harvest inefficiencies exacerbate on-field yield losses. Current estimates suggest that 30–40 percent of production is lost post-harvest, driven by inadequate pre-cooling infrastructure, improper handling, insufficient temperature-controlled transport, and poor packaging. These systemic losses erode farmer margins and undermine competitiveness, particularly for high-value perishables such as tomatoes, leafy greens, and berries.

Climate variability compounds these structural constraints. Increasingly frequent droughts, erratic rainfall, and temperature stress especially in

semi-arid and high-altitude zones disrupt crop phenology and intensify pest and disease outbreaks. While adaptive innovations such as drip irrigation, shade nets, and drought-tolerant cultivars exist, adoption rates remain low, especially among resource-constrained producers in central and western Tanzania.

Against this backdrop, the NHDS (2021–2031) identifies productivity enhancement as the linchpin for achieving its target of increasing national horticultural output to 15 million metric tons by 2030. The TARI-HIP operationalizes this ambition by investing in high-yielding, stress-tolerant seed systems, strengthening extension services through both digital and community-based models, and scaling affordable climate-smart technologies. Addressing systemic bottlenecks in productivity and technology adoption, the TARI-HIP provides the institutional pathway for bridging yield gaps, reducing volatility, and positioning Tanzania's horticulture sector as a competitive, resilient engine of agricultural transformation.

5. Value Chain Analysis and Market Linkages

The horticulture value chain in Tanzania is characterized by both considerable promise and persistent systemic weaknesses that constrain its competitiveness. At the upstream level, farmers face significant barriers to accessing quality input seeds, fertilizers, and agrochemicals, primarily due to high costs, fragmented distribution networks, and limited financing. These constraints suppress productivity and diminish the consistency of market supply. Aggregation systems remain underdeveloped, with few organized collection centres, thereby limiting economies of scale, raising transaction costs, and weakening farmers' bargaining power.

Post-harvest inefficiencies continue to erode value along the chain, with losses estimated at 30–40 percent, primarily attributable to inadequate cold storage, lack of pre-cooling and freezing infrastructure, poor handling, and insufficient temperature-controlled transport. These losses undermine returns for producers, especially in perishables such as tomatoes, leafy greens, and berries, while

simultaneously restricting the supply of consistent raw material for processing. Value addition remains underdeveloped, hindered by high technology costs, low investment, and inconsistent input supply factors that prevent Tanzania from capturing higher margins within regional and international markets.

Market access challenges compound these structural issues. Farmers struggle with limited market information, weak linkages to buyers, and significant regulatory hurdles. At the same time, the inability to consistently meet international sanitary and phytosanitary standards restricts competitiveness in premium export markets. Although horticultural exports have nearly doubled in recent years, reaching TZS 668.8 billion in 2023/24, growth potential remains constrained by systemic bottlenecks. Access to finance represents another critical barrier, as smallholders are often considered high-risk due to a lack of collateral, limited credit histories, and informal production arrangements. This capital constraint curtails investments in productivity-enhancing technologies and infrastructure.

Nevertheless, emerging institutional models such as cooperatives and contract farming provide promising avenues for strengthening vertical integration and addressing these market inefficiencies. Also, by pooling resources and negotiating collectively, cooperatives enhance access to inputs, credit, and bulk marketing opportunities. Contract farming arrangements, meanwhile, link farmers directly to buyers, providing stable markets, technical assistance, and price assurance mechanisms that foster trust and efficiency across the chain.

The NHDS (2021–2031) positions export expansion and post-harvest efficiency as national priorities. Specifically, it seeks to reduce post-harvest losses to below 20 percent by 2030 while enabling Tanzanian produce to compete in high-value regional and international markets. The TARI-HIP is designed as the operational instrument to achieve these goals by investing in pack houses, cold chain systems, certification services, and digital traceability platforms, while

institutionalizing cooperative and contract farming models. Also, by aligning its interventions with NHDS priorities, the TARI-HIP establishes both strategic coherence and a clear results pathway, reducing systemic inefficiencies, enhancing food security through waste reduction, and positioning horticulture as a globally competitive and resilient driver of Tanzania's agricultural transformation.

6. Research and Innovation Landscape in Horticulture

The horticulture research and innovation ecosystem in Tanzania is anchored by the TARI, which serves as the apex institution for public-sector agricultural research and development. Despite its pivotal mandate, the institutional landscape for horticultural research remains under-capacitated, fragmented, and insufficiently aligned with the dynamic needs of farmers and commercial market signals.

TARI oversees a dispersed network of zonal and crop-specific research centers, including Tengeru (vegetables, spices, herbs, and fruits), Makutupora (grapes), Mlingano (soils, spices, and fruits), Uyole (avocado, temperate fruits, round potatoes, banana), Maruku (banana and avocado), Kifyulilo (avocado and temperate fruits), Naliendele (mangoes and banana), Mikocheni (biotechnology), Dakawa (vegetables and fruits), Tumbi (indigenous fruits), Kihinga (avocado). These centers have delivered significant varietal advancements and contributed to the development of localized integrated pest management (IPM) protocols and post-harvest practices. However, horticulture-specific R&I receives less than 10% of total public research financing, despite the sub-sector's demonstrated potential for high returns per hectare, foreign exchange earnings, and job creation.

The current research architecture is predominantly supply-driven, with limited mechanisms for co-designing priorities in collaboration with producers, processors, exporters, and private seed companies. As a result, research outputs often lack commercial relevance or fail to reflect agro-ecological specificity and market requirements. The absence of formalized feedback loops between R&D, extension

services, and producer organizations further inhibits demand articulation and real-time technology scaling.

Knowledge dissemination pathways, including demonstration plots, Farmer Field Days (FFD), Farmer Field Schools (FFS), exchange visits, mass media, and extension materials (such as manuals, leaflets, posters, and brochures), are inconsistently funded and geographically uneven. Digital extension and e-learning platforms remain nascent, undermining the sector's ability to scale agronomic knowledge and climate-resilient technologies to remote production corridors. Farmer adoption of improved varieties and practices remains low, particularly among young people and women in semi-arid and marginalized agro-ecological zones.

While Tanzania has engaged in regional and global research partnerships with institutions such as the World Vegetable Center, icipe, ASARECA, and the CGIAR network, these collaborations are largely project-bound and lack institutional continuity. The absence of long-term co-financing mechanisms and underdeveloped research commercialization pathways limits the sustainability and scalability of imported innovations.

The system also lacks robust intellectual property (IP) frameworks, revenue-sharing models, and public-private co-investment instruments to catalyze private-sector engagement in upstream research and development (R&D). Without a functioning incentive structure for licensing, royalty collection, or agribusiness-driven innovation, the pathway from research to commercialization remains structurally weak.

7. Policy, Regulatory, and Institutional Environment

The horticulture subsector in Tanzania operates within a complex web of institutional mandates and policy frameworks that collectively define its direction and governance. At the national level, Tanzania Development Vision 2050, Tanzania Agricultural Master Plan 2050, National Fiver Year Development Plan (2021-2026) and ASDP II provide the overarching framework for sectoral transformation, under which horticulture is prioritized for its contribution to food security,

income generation, employment creation, and export diversification. Complementing this, the recently developed National Horticulture Development Strategy (NHDS) (2021–2030) provides a dedicated roadmap for unlocking the full potential of horticulture by strengthening productivity, value addition, market access, and institutional coordination.

Within this enabling environment, TARI plays a central role as the mandated national body for agricultural research and development. The Institute's Strategic Plan (2025–2030) explicitly positions horticulture as one of its strategic priorities, recognizing its transformative potential and the demand for research-based solutions to systemic challenges such as seed quality, post-harvest management, and climate resilience. TARI's strategic outcomes provide the backbone against which the horticultural research agenda is designed and executed.

The TARI-HIP is explicitly anchored in the TARI Strategic Plan (2025–2030), ensuring that its investment pillars directly operationalize the Institute's strategic outcomes on productivity, innovation, seed systems, climate resilience, and institutional strengthening. Furthermore, all TARI-HIP activities are programmed under the Ministry of Agriculture's Mid-Term Expenditure Framework (MTEF) and fully mapped to the TARI budget code. This guarantees that the TARI-HIP is not a parallel initiative, but rather an integral part of TARI's institutional strategy and the Government's budgetary framework, thereby enhancing sustainability, accountability, and financing predictability.

In addition, the TARI-HIP is aligned with regional and international frameworks such as the Comprehensive Africa Agriculture Development Programme (CAADP) and the African Union's Malabo Declaration, both of which call for accelerated agricultural transformation, greater investment in research, and enhanced private sector engagement. This harmonization ensures that TARI's horticultural research investments are not only nationally relevant but also regionally benchmarked and globally competitive.

8. SWOT Analysis of the Horticulture Sector

The strategic diagnostics, as presented in Table 1, conducted across Tanzania's horticultural landscape yield a nuanced understanding of sectoral dynamics, which are distilled here into a SWOT framework. This matrix serves as a foundational decision-making tool to inform programmatic prioritization, resource allocation, and the design of catalytic investment pathways.

Table 1: SWOT Analysis Matrix

Strengths	Weaknesses
Agro-ecological diversity enables year-round cultivation of a broad spectrum of horticultural crops, positioning Tanzania as a regional production hub. Agro-climatic mapping (see Map 1) highlights zones with comparative advantage in high-value vegetables, fruits, flowers, and spices.	Regulatory fragmentation, road infrastructures and institutional silos impede cohesive governance and sector-wide coordination, limiting the efficacy of reform implementation and investor facilitation.
Policy momentum is evident through elevated prioritization in flagship strategies, including ASDP-II, FYDP III, and the National Horticulture Development Strategy (NHDS).	Suboptimal productivity levels are driven by limited access to certified seed, low adoption of improved agronomic practices, and overstretched extension services.
Domestic and regional market growth, driven by urbanization and dietary transitions, is accelerating demand for fresh and processed horticultural produce.	High post-harvest losses, averaging 30–40%, stem from inadequate cold chain infrastructure, weak handling systems, and low investment in storage and processing assets.
Private sector coordination mechanisms to facilitate market linkages, policy dialogue, and value chain aggregation.	Underfunded R&I systems have constrained varietal innovation and technology transfer. Weak linkages between research outputs and farmer uptake remain a critical bottleneck.
Youth and women participation in agripreneurship and digital extension is	Land tenure insecurity, particularly among smallholders and women,

expanding, presenting a demographic dividend and innovation lever for climate-smart production systems.	hinders long-term investment in fixed productive assets, such as irrigation systems, pack houses, and greenhouses.
	Limited use of ICT technologies and experts in the horticultural value chain
	Inadequate number of professional experts in the horticultural industry (breeding, plant protection, agronomy, post-harvest)
Opportunities	**Threats**
Regional integration under AfCFTA and EAC protocols, combined with preferential access to the EU and GCC markets, offers strong export growth potential for high-value crops.	Climate variability, characterized by increasing incidence of droughts, pests, and erratic rainfall, poses a systemic threat to yield stability and investment viability.
The emergence of climate-resilient technologies, including precision irrigation, protected cultivation, and stress-tolerant varieties, presents a significant scope for yield intensification and climate adaptation.	
Investment in value chain infrastructure, including aggregation centers, pack houses, and cold storage, can significantly reduce post-harvest losses and enhance market efficiency.	Policy inconsistency, including abrupt export restrictions and fluctuating regulatory enforcement, undermines market predictability and investor confidence.
Public–private partnerships (PPPs) in seed production, irrigation systems, and research commercialization offer scalable platforms for co-financing innovation and enhancing service delivery.	The widespread circulation of counterfeit inputs, resulting from weak market surveillance, dilutes farm-level productivity and increases production risk.
Institutional and policy reform initiatives targeting input regulation, land	Volatile international markets, coupled with stringent sanitary and

administration, and knowledge dissemination systems are gaining traction and could unlock significant productivity gains if systematically implemented.	phytosanitary (SPS) standards, present barriers to sustained export competitiveness.
Presence of research centres in agroecological zones	Lack of adequate quality control and testing methods as per international standards for horticulture produce
Leverage carbon sequestration practices within horticultural systems as an innovative investment opportunity to enhance climate resilience, improve soil health, and unlock access to carbon financing through voluntary and compliance carbon markets.	
Emerging AI-based solutions for optimized fertilizer use, pests and disease control, and irrigation offer potential to enhance productivity, reduce input costs, and improve environmental sustainability in horticulture.	

ANNEX II: Results Matrix

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
Outcome 1 Improved productivity of horticultural crops in Tanzania	Average yield of key horticultural crops increased	Measures changes in crop productivity for priority crops	Tons/ha (Million)	7.52	11.8	Agricultural Surveys, TARI Trials, MOA Budget Speech	Crop-cutting, Farmer interviews	Annually	MoA, TARI, LGA's, COPRA, Private Sector
	Percentage of farmers adopting improved seed varieties	Proportion of farmers using certified seeds	%	33	57.5	Input supplier records, Farmer surveys, World Vegetable centre, TARI Reports	Structured interviews, Field verification	Annually	MoA, TARI, LGA's, ASA, TOSCI, Private Sector
	Percentage of farms implementing site-specific agronomic packages	Tracks tailored application of agro-techniques	%	15	40	Extension Logs, Farmer Records	Farm visits, Extension reports	Annually	MoA, TARI, LGA's, Private Sector
	Hectares under improved agronomic practices	Area cultivated using modern techniques	Hectares	250,000	600,000	Extension/M&E Reports, TAHA	Field mapping, Staff logs	Semi-annually	MoA, TARI, LGA's, Private Sector and Farmers
Output 1:1 Site-specific agronomic packages for key horticultural crops developed	Number of site-specific agronomic packages developed for key horticultural crops	Quantifies the tailored agronomic protocols created for different agro-ecological zones	Number	8	20	TARI Reports, Extension Documents, MOA, TAHA	Document review, Expert validation	Annually	MoA, TARI, LGA's, Private Sector and Farmers
	Percentage of target zones covered by site-specific agronomic recommendations	Coverage of developed packages across production zones	%	30	80	Extension Reports, GIS Mapping,	Spatial analysis, Field validation	Annually	MoA, TARI, LGA's, Private Sector and Farmers

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
	Number of demonstration plots established for agronomic package validation	Field validation plots for testing agronomic packages	Number	120	300	Field Trials, Extension Logs, TARI Reports	Field visits, Trial documentation	Semi-annually	MoA, TARI, LGA's, Private Sector and Farmers
	Number of extension officers trained on site-specific agronomic packages	Tracks capacity building for frontline agents	Number	450	1,200	Training Reports, Attendance Sheets, TARI, World Vegetable Centre	Training logs	Annually	MoA, TARI, LGA's, Private Sector and Farmers
Output 1:2 High-yielding resistant/tolerant to biotic and abiotic stress horticultural crop varieties released	Number of high-yielding, resistant/tolerant to biotic and abiotic stress of horticultural varieties released	Measures variety released	Number	22	47	TOSCI, TARI Variety Release Logs	Document review, Certification records	Annually	MoA, TARI, LGA's, Private Sector
	Percentage of released varieties adopted by farmers	Tracks uptake of improved varieties in the field	%	35	60	Farmer Surveys, Seed Sales Records	Survey analysis, Input sales tracking	Annually	MoA, TARI, LGA's, Private Sector, Farmers, ASA
	Number of agro-ecological zones with adapted released varieties	Distribution of varieties responsive to local conditions	Number	4	7	TARI Agroecologiacal Zona Trials	Trial reports, GIS maps	Annually	TARI, LGA's, Farmers
	Number of local horticultural varieties released	Local varieties released	Number	0	5	TARI Reports	TARI Reports	Annually	TARI, LGA's, Farmers
Output 1:3	Number of field demonstrations showcasing	Awareness-building activities through demos	Number	30	120	Demonstration Records,	Site visits	Annually	TARI, LGA's, Farmers, Private

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
Integrated crop and soil fertility management practices standardized	integrated fertility management					Extension Reports TARI Reports			Sector, TFRA, MoA
	Percentage of farmers trained on standardized fertility practices	Extension and training coverage for improved soil practices	%	15	30	Extension Logs, Training Reports	Farmer training surveys	Semi-annually	TARI, LGA's, Farmers, Private Sector, TFRA, MoA
	Percentage change in fertilizer use per hectare	Efficiency indicator for improved fertility management	%	2	10	Field Trials, Farmer Input Logs	Input-output analysis	Annually	TARI, LGA's, Farmers, Private Sector, TFRA, MoA
Output 1:4 Irrigation technologies and water-use efficiency solutions piloted	Number of irrigation technologies piloted in horticulture	Innovative water-efficient irrigation systems tested	Number	5	8	Irrigation Trials, R&D Reports	Trial documentation	Annually	TARI, LGA's, Farmers, MoA, NiRC
	Percentage change in water use efficiency in piloted plots	Efficiency of water application from piloted technology	%	35	70	Field Monitoring Logs, TARI Reports	Water use audits, Plot measurement	Annually	TARI, LGA's, Farmers, MoA, NiRC, Water Basin Authorities
	Number of farmers trained in irrigation technologies piloted	Capacity development for water-efficient practices	Number	3000	10,000	Training Reports, Extension Data	Attendance lists, Farmer interviews	Annually	TARI, LGA's, Farmers, MoA, NiRC
	Number of functional pilot irrigation systems installed	Tracks installation and operationalization of systems	Number	25	51	Project Reports, Field Visits	Installation records	Annually	TARI, LGA's, Farmers, MoA, NiRC, Water Basin Authorities
Outcome 2	Number of new horticultural	Tracks R&D outputs like	Number	5	15	TARI Reports	Document review	Annually	TARI, LGA's, Farmers,

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
Strengthened national capacity for horticultural research and innovation .	technologies developed	varieties or IPM tools							MoA, Private Sector
	Percentage of research staff trained	Proportion of researchers trained in modern techniques	%	20	80	TARI HR Records	Post-training assessments	Semi-annually	TARI, MoA
	Number of research publications and bulletins	Knowledge products published and disseminated	Number	TBD	25	TARI Publications	Document review	Quarterly	TARI
	Number of active national/international research partnerships	Tracks collaborations enhancing R&I capacity	Number	12	30	MoA/TARI Partnership Logs	MoU analysis, Interviews	Annually	TARI, MoA
Output 2.1 Institutional capacity of horticultural research centres platforms established	Institutional capacity of horticultural research platforms established	Number of operational research centers with functional infrastructure	Number	0	3	MoA Infrastructure Reports, TARI Logs	Site inspections, Facility assessments	Annually	TARI
	Number of new research infrastructure units constructed or rehabilitated	Tracks establishment or refurbishment of labs, greenhouses, etc.	Number	4	12	TARI Infrastructure Unit	Progress reports, Verification	Annually	TARI, MoA
	Number of governance frameworks developed for research centers	Institutional guidelines, SOPs, and quality control frameworks	Number	2	6	TARI Admin Reports	Document review	Annually	TARI
Output 2.2 Data analytics and digital	Number of digital tools and analytics systems operationalized	Tracks establishment of MIS, databases, GIS systems	Number	TBD	10	ICT Unit, TARI ICT Reports	System inventory, Progress reports	Annually	TARI, MoA, eGA

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
systems for horticultural research operationalized	Percentage of researchers using digital systems in research processes	Digital adoption in data collection, storage, and analysis	%	TBD	50	TARI Usage Logs, ICT Surveys	System usage reports	Annually	TARI, MoA, eGA
	Number of horticultural datasets digitized and accessible	Data management systems for crop trials, lab outputs	Number	TBD	50	TARI KM Unit, Research Logs	Database analysis	Annually	TARI, MoA
	Number of staff trained in using research digital systems	Capacity to apply digital tools in R&D	%	5	50	Training Reports, ICT Unit Logs	Training attendance, Post-tests	Annually	TARI, MoA
Output 2.3 Strategic research partnerships with national and international institutions enhanced	Number of strategic MoUs signed with national/international institutions	Formal collaboration agreements for joint research	Number	TBD	25	MoA, TARI	Document review	Annually	TARI, MoA
	Number of joint research projects implemented with partners	Active partnerships producing research outputs	Number	8	25	Project Logs, MoA Reports	Progress review	Annually	TARI, MoA
	Percentage of TARI research budget co-financed by partners	Level of external funding mobilized through collaboration	%	TBD	TBD	TARI Financial Records	Budget analysis	Annually	TARI,MoA
	Number of knowledge exchange events held with partners	Joint workshops, symposiums, or co-learning sessions	Number	6	20	Event Reports, Calendar Logs	Event records	Annually	TARI, MoA, Private Sector, LGA's
Output 2.4 Capacity development programs for	Number of researchers trained through formal CPD programs	Technical and managerial training sessions completed	Number	10	40	Training Institutions, HR Logs	Training documentation	Annually	TARI, Academic Institutions.

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
horticultural researchers implemented	Percentage of researchers demonstrating improved competencies post-training	Skills gain assessed via tests or performance appraisal	%	TBD	TBD	Training Evaluation Reports	Pre/post-assessments	Annually	TARI
	Number of mentorship programs implemented for junior researchers	Structured capacity development via coaching	Number	2	10	Mentorship Program Logs	Mentor reports	Annually	MoA, TARI, Private sector.
	Number of training modules developed for horticultural researchers	Curriculum or training materials crafted	Number	5	10	TARI KM and Training Units	Content review	Annually	MoA, TARI, Private sector.
Output 2.5 Dedicated horticulture research budget lines integrated	Number of budget lines created for horticultural research	Dedicated lines in institutional/ministerial budgets	Number	TBD	6	MoA and TARI Budget Reports,	Budget review	Annually	MoA, TARI
	Percentage of allocated horticulture R&I budget executed	Budget absorption as indicator of financial capacity	%	TBD	10	TARI Finance Reports	Budget execution review	Annually	TARI
	Amount of public resources allocated to horticultural R&I	Monetary value committed to research	TZS (Billion)	TBD	TBD	MoA/TARI Financial Statements	Document review	Annually	MoA, TARI
	Number of advocacy events for increased research financing	Efforts to increase funding through lobbying or campaigns	Number	2	12	Event Reports	Advocacy tracking logs	Annually	MoA, TARI, CGIAR centers.
Output 2.6	Number of technology incubation	Innovation hubs or incubators functioning	Number	8	15	Innovation Unit Reports	Field visits, Progress reports	Annually	TARI, Donors.

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
Technology incubation and testing platforms launched	platforms operationalized								
	Number of technologies tested and evaluated through incubation	Technologies undergoing proof-of-concept or validation	Number	5	25	Testing Platform Logs	Trial documentation	Annually	TARI, Donors LGA's.
	Number of public-private partnerships linked to incubation platforms	Private sector involvement in innovation testing	Number	3	12	PPP Logs, MoUs	Contract review	Annually	TARI, LGA's, MoA.
	Percentage of incubated technologies reaching commercialization stage	Success rate from concept to market entry	%	10	50	TARI Commercialization Reports	Tracking records	Annually	MoA, TARI, Private sector, LGA's
Outcome 3: Strengthened post-harvest management and value addition in the horticulture sector.	Percentage change in post-harvest losses	Reduction in quantity lost post-harvest	%	TBD	TBD	Post-harvest Surveys	Market/farmer interviews	Annually	MoA, TARI, Farmers, Private sector
	Number of value-added products developed	New processed horticulture products	Number	10	30	Processors' Reports	Facility visits	Annually	MoA, TARI, Private sector, TBS.
	Number of functional post-harvest centers supported	Operational hubs for aggregation or processing	Number	3	10	MoA Infrastructure Reports	Field verification	Annually	MoA, TARI, LGA's, Private sectors.
	Percentage of producers linked to markets	Share of farmers with access to structured markets	%	35	50	Market Access Records	Trader/farmer interviews	Annually	MoA,TARI, Private sector.
Output 3.1 Cold storage and cooling	Cold storage and cooling technology models for rural	Number of cold storage or cooling systems piloted at	Number	0	25	Postharvest Project Reports	Field visits, Pilot documentation	Annually	TARI, MoA, LGA's, Private sector

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
technology models for rural aggregation points piloted	aggregation points piloted	rural aggregation hubs							
	Percentage of piloted facilities maintaining optimal storage conditions	Storage effectiveness in temperature/humidity standards	%	0	20	Storage Monitoring Logs	Sensor audits, Inspections	Annually	TARI, MoA, LGA's, Private sector
	Number of farmers accessing cold storage facilities	Extent of utilization by producer groups or individuals	Number	0	2500	Facility Usage Logs	Beneficiary registers	Annually	MoA, TARI, Farmers, LGA's, Private sector
	Postharvest losses reduced due to cold storage (%)	Effectiveness of cold storage in minimizing losses	%	35	20	Impact Assessment Studies	Before-after analysis	Annually	MoA, TARI, Farmers, LGA's, Private sector
Output 3.2 Market-linked postharvest value addition technologies validated	Number of market-linked value addition technologies validated	Processed technologies tested and aligned with market demand	Number	4	15	Processing Trials, Technology Reports	Lab/field evaluations	Annually	MoA, TARI, Private sector, Farmers
	Percentage change in shelf life of horticultural products processed	Shelf-life extension attributable to value addition methods	%	10	20	Lab Results, Market Studies	Product testing	Annually	TARI, Farmer, LGA's Private sector.
	Number of processors trained on validated technologies	Capacity building targeting postharvest actors	Number	150	650	Training Reports	Attendance logs, Pre/post-tests	Annually	TARI, Private sector, Processors
	Number of partnerships formed with agro-processors and buyers	Market linkage via postharvest innovation	Number	10	40	MoU Logs, Value Chain Reports	MoU review	Annually	TARI, MoA, Private sector, SIDO.

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
Output 3.3 Postharvest handling protocols for perishable horticultural crops developed	Number of postharvest handling protocols developed for perishable crops	Officially documented good handling practices	Number	6	20	TARI Protocol Repositories	Document review	Annually	TARI, Academic institutions, CGIAR centers
	Percentage of farmers trained in postharvest handling protocols	Training coverage across production regions	%	12	55	Extension Reports	Training attendance records	Annually	MoA, Farmers, TARI, LGA's, Academic institutions.
	Change in postharvest quality losses (visual, nutrient, spoilage)	Measured improvement in crop quality post-handling	%	0	30	Lab Reports, Quality Assessment Logs	Sample analysis	Annually	TARI, LGA's, Farmers.
	Number of extension agents equipped to disseminate postharvest protocols	Staff readiness for protocol rollout	Number	200	600	Extension Capacity Reports	Training records	Annually	MoA, TARI, LGA's.
Outcome 4: Improved horticultural seed production systems.	Number of certified horticultural seed varieties produced	Reflects local certified seed production	Number	32	52	TOSCI, TARI, Seed Producers	Certification records	Annually	TARI, TOSCI, ASA, Private sector
	Number of farmers using certified seeds	Uptake of quality seed among farmers	Number	250,000	600,000	Farmer Surveys	Interviews, Usage verification	Annually	TARI, ASA, TOSCI, Farmers.
	Number of local seed multipliers supported	Measures institutional support to local seed actors	Number	40	120	Extension Reports	Project/M&E logs	Annually	TARI, Local seed multipliers, TOSCI.
	Volume of certified seed produced	Total seed output by certified systems	Metric tons	100	500	Seed Producers' Records	Data registry review	Annually	Seed producers, TARI, TOSCI, ASA.

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
Output 4.1 Early generation seed production systems for horticultural crops strengthened	Early generation seed production systems for horticultural crops strengthened	Area of Early Generation Seed (EGS) production plots established	Hectares	10	30	TARI Seed Reports	Field verification	Annually	TARI, TOSCI, ASA, Seed companies.
	Volume of EGS produced	Measures EGS availability by weight	Metric tons	10	40	TARI Production Logs	Production records	Annually	TARI, ASA, TOSCI, Seed companies.
	Number of centres engaged in early generation seed production	Centres actively producing EGS	Number	2	5	MoA, TOSCI, TARI, ASA	Registration records	Annually	MoA, TOSCI, TARI, ASA, Seed companies.
	Percentage change in EGS supply for priority horticultural crops	Growth in EGS availability over baseline	%	TBD	TBD	Seed Reports, Baseline Studies	Comparative analysis	Annually	MoA, TOSCI, TARI, ASA, Seed companies.
Output 4.2 Adaptation trials for priority horticultural crops conducted	Number of adaptation trials conducted for priority horticultural crops	On-station or on-farm trials assessing variety desired traits.	Number	30	120	TARI Trial Reports	Field evaluation	Annually	TARI, Famers, LGA's
	Number of agro-ecological zones covered by adaptation trials	Geographic spread of trial implementation	Number	5	7	TARI Reports	Review of TARI Report	Annually	TARI, LGA's, Farmers
	Number of trials leading to variety recommendation	Conversion rate from trial to release-ready recommendation	Number	6	30	Variety Release Logs	Evaluation reports	Annually	TARI, Farmers, LGA's
	Number of farmers involved in participatory varietal selection (PVS)	Farmer participation in trial evaluation	Number	1000	4,000	PVS Reports	Farmer lists, Feedback forms	Annually	TARI, Farmers, LGA's, Private sector.

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
Output 4.3 Public-private platforms for seed system governance institutionalized	Number of public-private dialogue forums on seed systems held	Engagement events between Government and private seed actors	Number	0	5	Meeting Minutes, MoA Reports	Activity documentation	Annually	MoA, TARI, Private sector, TASTA, LGA's, TOSCI, ASA Farmers
	Number of seed industry stakeholders participating in governance platforms	Institutional inclusion in decision-making bodies	Number	15	30	Governance Framework Records	Membership logs	Annually	MoA, TARI, Private sector, TASTA, LGA's, TOSCI, ASA Farmers
	Number of policy recommendations adopted through seed platforms	Policy improvements proposed and formalized	Number	0	3	Policy Reports	Decision records	Annually	MoA, TARI, Private sector, TASTA, LGA's, TOSCI, ASA Farmers
	Percentage of meetings with actionable resolutions implemented	Effectiveness of governance dialogue outcomes	%	0	40	MoA Implementation Reports	Follow-up review	Annually	MoA, TARI, Private sector, TASTA, LGA's, TOSCI, ASA Farmers
Outcome 5: Enhanced technology dissemination and extension system in horticulture.	Percentage of farmers receiving timely extension services	Timely support from trained agents	%	38	70	TARI and LGA Reports	Service logs, Field visits	Quarterly	TARI, LGA's, Farmers.
	Number of extension materials disseminated	Leaflets, manuals, videos, etc.	Number	15,000	50,000	MoA Knowledge Management Systems, TARI, LGA	Document tracking	Quarterly	MoA. TARI, LGA's

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
	Number of trained extension officers in horticulture	Specialized officers deployed in the field	Number	420	800	MoA HR/Training Records, TARI, LGA	Training reports	Annually	MoA. TARI, LGA's
	Number of ICT-based platforms operational for extension	Use of digital tools (apps, SMS, USSD)	Number	3	10	ICT Unit, Extension Systems	Platform registry review	Annually	MoA, TMA, TARI, LGA's, Farmers.
Output 5.1 Farmer-centered training modules for horticultural technologies developed	Farmer-centered training modules for horticultural technologies developed	Number of participatory training modules designed and validated	Number	10	25	TARI KM and Extension Units	Document review	Annually	MoA, TARI, Farmers, LGA's, Private sector.
	Percentage of modules incorporating local language and context	Localization of training materials to farmer realities	%	40	80	MoA- ARDS, TARI- KM	Content analysis	Annually	MoA, TARI
	Number of stakeholders engaged in co-creation of modules	Extent of participatory development involving farmers and extensionists	Number	25	100	Workshop Reports	Participant records	Annually	MoA, TARI, Farmers, LGA's, Private sector
	Percentage of farmers reporting improved knowledge from modules	Knowledge gain attributable to training materials	%	20	50	Farmer Feedback Surveys	Post-training evaluation	Annually	TARI, MoA, Farmers, LGA's private sector.
Output 5.2 Inclusive technology dissemination platforms targeting women, youth,	Number of inclusive dissemination platforms established	ICT, radio, mobile vans, or village centers targeting marginalized groups	Number	5	20	Extension Service Records	Platform registry, Field visits	Annually	TARI, MoA, Farmers, LGA's private sector, Media.
	Percentage of platform beneficiaries who	Equity in reach of dissemination efforts	%	35	50	User Logs, Beneficiary Surveys	Data disaggregation	Annually	TARI, MoA, Farmers, LGA's private

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
and remote producers established	are women or youth								sector, Media.
	Number of horticultural messages delivered through each platform	Scale of message distribution across platforms	Number	20	60	Communication Logs	Message tracking reports	Quarterly	TARI, MoA, Farmers, LGA's private sector, Media.
	Percentage of farmers accessing information via dissemination platforms	Reach of platforms across target population	%	10	40	Farmer Surveys	Phone/household interviews, Media coverage	Annually	Media, TARI, LGA's, Private sector, Farmers
Output 5.3 Adaptive research platforms linking researchers, extension agents, and farmers established	Number of adaptive research platforms established	Collaborative learning structures (innovation platforms, multi-actor forums)	Number	5	10	TARI Field Reports	Field verification	Annually	TARI, MoA, Farmers, LGA's private sector,
	Number of joint research-extension-farmer trials conducted	Adaptive trials implemented through stakeholder collaboration	Number	30	120	Trial Logs, Field Books	Site visits, Trial data review	Annually	TARI, MoA, Farmers, LGA's private sector,
	Percentage of recommendations from platforms adopted by farmers	Effectiveness of platforms in promoting technology uptake	%	20	60	TARI reports	Farmer interviews, M&E reviews	Annually	TARI, MoA, Farmers, LGA's private sector,
	Number of institutions participating in adaptive research platforms	Extent of stakeholder engagement	Number	10	30	Platform Membership Logs	Institutional mapping	Annually	TARI, MoA, Farmers, LGA's private sector,
Output 5.4 Training-of-trainers (ToT)	Number of extension officers trained through ToT programs	Technical backstopping for front-line extensionists	Number	200	800	Training Attendance Logs	Training reports	Annually	TARI, MoA, Farmers, LGA's private sector,

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
programs for horticultural extension officers implemented	Percentage of trained officers applying technologies in fieldwork	Application of skills post-training	%	50	75	Follow-up Assessments	Field observations, Self-reports	Annually	TARI, MoA, Farmers, LGA's private sector,
	Number of ToT curricula reviewed and updated	Quality control and curriculum improvement	Number	2	8	Curriculum Development Reports	Content review	Annually	TARI, MoA, Farmers, LGA's private sector,
	Percentage of LGAs implementing ToT-trained agents	Institutional integration of trained staff	%	TBD	TBD	LGA Extension Deployment Logs	HR records	Annually	TARI, MoA, LGA's
Output 5.5 Demonstration plots and FFS showcasing TARI-recommended horticultural technologies established	Number of demonstration plots and FFS established	Field-level evidence centers for farmer learning	Number	120	600	Extension Logs, TARI Reports	Field inspections	Annually	TARI, MoA, LGA's, Farmers, Private sector
	Percentage of demo sites aligned with TARI-recommended technologies	Ensuring consistency with validated innovations	%	60	95	Demo Plot Monitoring Reports	Site assessments	Annually	TARI, MoA, LGA's, Farmers, Private sector
	Number of farmers reached through FFS or demos	Training reach through participatory methods	Number	25,000	150,000	Attendance Records	Farmer lists, Event logs	Annually	TARI, MoA, LGA's, Farmers, Private sector
	Percentage of farmers applying knowledge gained from demos	Behavioral adoption of technologies post-exposure	%	TBD	TBD	Adoption Surveys	Farmer follow-up visits	Annually	TARI, MoA, LGA's, Farmers, Private sector
Outcome 6: Enhanced climate	Number of climate-smart technologies adopted	Tolerance/resistance to biotic and abiotic stresses	Number	10	30	Field Trials, Extension Logs	Farmer surveys	Annually	TARI, MoA, LGA's, Farmers, Private sector

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
resilience in horticultural production systems.	Percentage of farmers using water efficient technology	Proportional of farmers using water use efficiency systems	%	15	40	Irrigation Program Data	Farmer interviews	Annually	TARI, MoA, LGA's, Farmers, NiRC
	Number of farmers trained on climate-smart practices	Capacity-building on CSA in horticulture	Number	10,000	60,000	Training Reports	Attendance logs	Annually	TARI, MoA, LGA's, Farmers,
	Number of early warning advisories disseminated	Bulletins, SMS alerts,Media etc.	Number	10	50	TMA, MoA Bulletins	Message logs	Quarterly	TMA, TARI, MoA, Media, farmers
Output 6.1 Climate-resilient horticultural crop varieties adapted	Climate-resilient horticultural crop varieties adapted	Number of climate-resilient varieties tested and recommended	Number	4	20	TARI Variety Trial Reports	Field evaluations	Annually	TARI, TOSCI, Farmers, LGA's, Private sector
	Percentage of tested varieties performing above threshold under climate stress	Performance rate under biotic and abiotic stresses	%	20	80	Trial Data, Lab Reports	Comparative analysis	Annually	TARI Farmers, LGA's, Private sector
	Number of agro-ecological zones covered by adaptation trials	Extent of resilience testing across environments	Number	4	7	TARI Reports, GIS Data	Field tracking	Annually	TARI Farmers, LGA's, Private sector
	Number of farmers adopting climate-resilient horticultural varieties	Uptake of varieties bred for resilience	Number	10,000	80,000	Farmer Survey, Seed Sales	Usage verification	Annually	TARI Farmers, LGA's, Private sector, TOSCI
Output 6.2 Integrated pest and disease management	Integrated pest and disease management packages developed	Number of IPDM packages formulated and documented	Number	6	15	TARI crop Protection Unit, Extension Reports	Protocol review	Annually	TARI, CGIAR, TPHPA, Academic institutions.

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
packages developed	Number of farmers trained in IPDM practices	Reach training on pest/disease control	Number	8,000	50,000	Training Reports	Attendance records	Annually	TARI, CGIAR, TPHPA, Academic institutions.
	Percentage reduction in pesticide use among trained farmers	Efficiency of integrated solutions vs. chemicals	%	10	40	M&E Studies, Farmer Logs	Before-after analysis	Annually	TPHPA, TARI, Farmers
	Number of extension officers capacitated on IPDM dissemination	Institutional support for pest control efforts	Number	150	600	Extension Reports	Training reports	Annually	TPHPA, TARI, Farmers, LGA's
Output 6.3 Climate-smart horticultural technologies validated	Climate-smart horticultural technologies validated	Innovations tested for environmental suitability	Number	6	25	TARI Trials, Field Logs	Validation assessments	Annually	TARI, Farmers, LGA's, CGIAR
	Percentage of validated technologies adopted by farmers	Farmer uptake of proven climate-smart technologies	%	15	50	Adoption Surveys, Extension Reports	Farmer interviews	Annually	TARI, Farmers, LGA's, CGIAR
	Number of stakeholders involved in technology validation	Participatory trials and decision-making	Number	40	120	Stakeholder Logs	Participation tracking	Annually	TARI, Farmers, LGA's, CGIAR, Private sector, Farmers
	Number of technologies documented and promoted	Formalized and communicated climate-smart practices	Number	12	50	KM Reports, Brochures	Document analysis	Annually	TARI, Media, MoA, LGA's, private sector, farmers

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
Output 6.4 On-farm trials for climate-resilient practices across agro-ecological zones conducted	On-farm trials for climate-resilient practices across agro-ecological zones conducted	Trial activities under real-farm conditions	Number	40	150	Field Reports, Zonal Trials	On-farm monitoring	Annually	TARI, farmers, LGA's, Private sector.
	Number of zones with active on-farm climate-smart trials	Breadth of experimentation by location	Number	4	7	Zonal Extension Reports	GIS/trial maps	Annually	TARI, farmers, LGA's, Private sector.
	Percentage of trials demonstrating improved resilience outcomes	Success rate of tested technologies under stress	%	20	70	Field Monitoring Data	Performance analysis	Annually	TARI, farmers, LGA's, Private sector
	Number of farmers co-researching in on-farm trials	Engagement of farmers in trial design and feedback	Number	1,200	8,000	PVS Logs, Participation Sheets	Farmer tracking	Annually	TARI, farmers, LGA's, Private sector
Output 6.5 Knowledge on climate adaptation in horticulture disseminated	Knowledge on climate adaptation in horticulture disseminated	Number of briefs, manuals, or media materials distributed	Number	8	40	KM Platforms, Communication Logs	Dissemination records	Annually	TARI, farmers, LGA's, Private sector
	Percentage of extension agents trained in climate adaptation knowledge	Coverage of frontline service providers	%	20	70	Training Records	Attendance verification	Annually	TARI, farmers, LGA's, Private sector
	Number of farmer field schools (FFS) addressing climate risks conducted	Experiential learning centered on resilience topics	Number	100	500	FFS Reports	Activity documentation	Annually	TARI, farmers, LGA's, Private sector

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
	Percentage of farmers reporting improved awareness on climate-smart practices	Knowledge effect of dissemination efforts	%	30	70	Survey Results	Perception surveys	Annually	TARI, farmers, LGA's, Private sector
Outcome 7: Strengthened policy coherence and institutional coordination in the horticulture sector.	Number of horticulture-related policy reforms enacted	New policies or updates enacted	Number	1	4	Parliament/MoA Records	Policy review	Annually	MoA, TARI, Private sector
	Number of coordination forums held	National or regional multi-stakeholder platforms	Number	4	20	MoA Reports	Activity reports	Annually	MoA, TARI, Private sector
	Number of joint workplans developed among institutions	Cross-agency collaboration frameworks	Number	2	10	MoA, LGAs, Partners	Document review	Annually	MoA, LGA's, TARI, Private sector
	Percentage of horticulture programs aligned to national strategies	Degree of policy coherence	%	60	90	Program Reports	Strategy alignment assessment	Annually	MoA, LGA's, TARI, Private sector
Output 7.1 Horticulture-specific research policy priorities aligned with national agricultural strategies	Horticulture-specific research policy priorities aligned with national agricultural strategies	Number of horticulture policy priorities documented and harmonized with national strategies	Number	55	95	MoA, TARI	Policy document review	Annually	MoA, TARI
	Percentage of TARI research agenda items aligned with Government priorities	Degree of alignment of TARI strategic plans with broader national goals	%	65	95	Strategic Plans, Research Agenda	Agenda comparison analysis	Annually	MoA, TARI

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
	Number of policy review meetings conducted with key stakeholders	Consultative processes informing policy alignment	Number	2	8	Meeting Reports	Activity tracking	Annually	MoA, TARI, private sector
	Number of national or regional strategies referencing TARI policy inputs	Visibility of TARI in agricultural policy ecosystem	Number	1	6	Strategy Documents	Document analysis	Annually	MoA, TARI, private sector
Output 7.2 Stakeholder platforms for policy dialogue and knowledge exchange on horticulture institutionalized	Stakeholder platforms for policy dialogue and knowledge exchange on horticulture institutionalized	Number of platforms operationalized for multi-stakeholder engagement	Number	1	3	Platform Logs, MoA Coordination Reports, TARI	Institutional records	Annually	MoA, TARI, private sector
	Number of dialogue events held annually under formal platforms	Events facilitating engagement on policy and evidence	Number	4	12	Event Reports	Activity tracking	Annually	MoA, TARI, CGIAR, private sector
	Number of participants representing diverse stakeholder categories	Inclusivity in dialogue platforms (NGOs, private sector, farmers)	Number	120	500	Attendance Records	Participation logs	Annually	MoA, TARI, CGIAR, private sector,Farmers, NGOs, Donors
	Percentage of dialogue recommendations feeding into draft or final policy	Influence of dialogues on policy formulation	%	30	75	Policy Drafts, Dialogue Summaries	Content analysis	Annually	MoA, TARI,
	Institutional coordination mechanisms between	Number of coordination structures (committees,	Number	1	3	MoU Logs, Joint Taskforce Reports	Review of coordination mechanisms	Annually	MoA, TARI,

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
	research, regulatory, and extension actors established	taskforces, MoUs) functioning							
	Number of joint action plans implemented across horticulture institutions	Collaborative planning and implementation processes	Number	1	8	Joint Workplan Reports	Implementation records	Annually	MoA, TARI, LGA's, CGIAR, Private sector
	Percentage of coordination meetings resulting in actionable decisions	Effectiveness of coordination efforts	%	30	80	Meeting Minutes, Action Logs	Outcome review	Annually	MoA, TARI, LGA's, CGIAR, Private sector
	Number of institutions participating in formal coordination bodies	Institutional participation in structured coordination	Number	10	30	Coordination Membership Lists	Institutional records	Annually	MoA, TARI, LGA's, CGIAR, Private sector
Output 7.4 Capacity-building programs on policy analysis and coordination for TARI and partner institutions implemented	Capacity-building programs on policy analysis and coordination for TARI and partner institutions implemented	Number of training programs conducted	Number	1	6	Training Reports, MoA Capacity Building Logs	Training activity records	Annually	MoA, TARI, Partners institution
	Percentage of trained staff demonstrating improved policy analysis skills	Assessment of learning outcomes from training	%	25	80	Training Evaluations	Pre/post tests	Annually	TARI
	Number of policy analysts trained across institutions	Technical HR capacity in policy analytics	Number	5	25	Institutional HR Reports	Training and HR records	Annually	TARI, Partners institution

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
	Number of policy research papers or case studies produced by trained staff	Knowledge products generated post-training	Number	4	20	TARI KM Logs, MoA Reports	Publication review	Annually	MoA, TARI
Output 7.5 Policy briefs on key horticulture system constraints and reform recommendations produced	Policy briefs on key horticulture system constraints and reform recommendations produced	Number of policy briefs and backgrounders developed	Number	6	25	TARI Policy Desk, Research Units	Publication tracking	Annually	TARI, CGIAR,
	Percentage of briefs submitted to decision-makers or development partners	Utilization of policy outputs in influencing decisions	%	40	90	Submission Logs	Document dispatch verification	Annually	TARI, Partners institution
	Number of dissemination forums for policy briefs organized	Events sharing policy research and recommendations	Number	4	16	Event Reports, MoA KM Platforms	Event documentation	Annually	MoA, TARI
	Percentage of briefs referenced in national policy or donor reports	Uptake of policy recommendations	%	10	50	Citation Analysis Reports	Content analysis	Annually	MoA, TARI
Outcome 8: Increased gender equity and youth inclusion in horticultural development systems.	Percentage of youth and women in horticulture programs	Inclusiveness of interventions	%	33	50	Program M&E Data	Beneficiary records	Annually	MoA, TARI, BBT, LGA's, Farmers
	Number of gender/youth-specific innovations supported	Innovations tailored to youth/women	Number	2	10	Innovation Grants Data	Project records	Annually	MoA, TARI, BBT, LGA's, Farmers
	Number of capacity-building	Training/mentorship schemes	Number	5	20	Training Reports	Attendance logs	Annually	MoA, TARI, BBT, LGA's,

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
	programs targeting youth/women								Farmers, Private sector
	Percentage of decision-making roles held by women/youth in farmer groups	Leadership participation	%	20	50	Farmer Organization Reports	Membership registers	Annually	MoA, TARI, BBT, LGA's, TCDC, Farmers, Private sector
Output 8.1 Participation of women and youth in horticultural research and extension activities increased	Participation of women and youth in horticultural research and extension activities increased	Number of women and youth participating in R&I and extension programs	Number	1000	6000	Extension Records, Research Participation Logs	Participant tracking	Annually	MoA, TARI, BBT, LGA's, Farmers, Private sector
	Percentage of total participants in horticultural programs who are women or youth	Share of inclusivity among target beneficiaries	%	20	50	Program M&E Reports	Data disaggregation	Annually	MoA, TARI, BBT, LGA's, Farmers,
	Number of outreach campaigns targeting women and youth	Awareness efforts promoting participation	Number	3	12	Outreach Logs	Activity documentation	Annually	MoA, TARI, BBT, LGA's, Farmers, Private sector, media
	Percentage change in female/youth representation over baseline	Growth in inclusion from starting point	%	20	50	Baseline & Follow-up Surveys	Comparative analysis	Annually	MoA, TARI, BBT, LGA's, Farmers
Output 8.2 Gender-responsive and youth-inclusive research	Gender-responsive and youth-inclusive research protocols for horticultural	Number of protocols incorporating gender/youth considerations	Number	0	5	Research Protocol Records	Document review	Annually	MoA, TARI, BBT, LGA's,

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
protocols for horticultural innovation developed	innovation developed								
	Percentage of horticultural research projects applying inclusive protocols	Application rate of equity-focused methods	%	10	80	Project Reports	Protocol tracking	Annually	TARI
	Number of researchers trained on gender/youth-responsive R&I	Capacity building for inclusive innovation	Number	10	80	Training Records	Attendance logs	Annually	TARI
	Percentage of inclusive protocols validated by target beneficiaries	Stakeholder validation of appropriateness	%	0	70	Validation Workshop Reports	Surveys, Feedback forms	Annually	MoA, TARI, LGA's, Farmers
Output 8.3 Capacity-building programs targeting women and youth in horticultural entrepreneurship implemented	Capacity-building programs targeting women and youth in horticultural entrepreneurship implemented	Number of targeted training programs delivered	Number	3	15	Training Reports	Activity tracking	Annually	MoA, TARI, LGA's, BBT, Farmers
	Number of women and youth trained in business and technical skills	Individuals benefiting from targeted support	Number	500	5000	Training Logs	Attendance and certification records	Annually	MoA, TARI, LGA's, BBT, Farmers
	Percentage of trained beneficiaries initiating or expanding horticultural enterprises	Entrepreneurial outcomes of the program	%	15	45	Follow-up Assessments	Phone interviews, Field visits	Annually	MoA, TARI, LGA's, BBT, Farmers

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
	Number of mentorship and coaching sessions held for women and youth	Support structures for applied entrepreneurship	Number	20	100	Mentorship Program Logs	Mentor reports	Annually	MoA, TARI, LGA's, BBT, Farmers
Output 8.4 Partnerships with women- and youth-led producer organizations in horticulture strengthened	Partnerships with women- and youth-led producer organizations in horticulture strengthened	Number of MoUs or partnerships with inclusive producer groups	Number	5	25	MoU Logs, Partner Reports	Document review	Annually	MoA, TARI, LGA's, TCDC, BBT, Farmers
	Number of inclusive producer organizations supported with inputs or training	Material or knowledge-based support delivered	Number	30	100	Support Program Logs	Verification reports	Annually	MoA, TARI, LGA's, TCDC, BBT, Farmers
	Percentage of supported organizations with improved production/output	Organizational-level results from support	%	20	60	Monitoring Reports	Impact analysis	Annually	MoA, TARI, LGA's, TCDC, BBT, Farmers
	Number of joint ventures initiated with private sector actors	Market and value chain linkages created	Number	2	15	Private Sector Engagement Logs	MoUs, Partnership records	Annually	TARI, Private sectors
Output 8.5 Gender and youth equity indicators in horticultural R&D monitoring systems integrated	Gender and youth equity indicators in horticultural R&I monitoring systems integrated	Number of indicators disaggregated by gender and age in M&E systems	Number	1	2	M&E Frameworks, Indicator Registry	System review	Annually	MoA, TARI, BBT, LGA's, Farmers
	Percentage of routine M&E reports that include	Mainstreaming of inclusivity in reporting	%	10	60	M&E Reports	Content analysis	Annually	TARI

Results Level	Outcome Indicator	Indicator Description	Unit of Measure	Baseline (2025)	Target (2030)	Data Source	Data Collection Method	Frequency	Responsible personnel
	gender/youth analysis								
	Number of M&E officers trained on gender/youth-sensitive data collection	Institutional capacity for inclusive monitoring	Number	5	40	Training Reports	Training records	Annually	MoA, TARI, LGA's
	Number of evaluations or reviews incorporating gender/youth indicators	Extent of integration in analytical work	Number	1	7	Evaluation Reports	Review analysis	Annually	TARI