SLARI

SIERRA LEONE AGRICULTURAL RESEARCH INSTITUTE

STRATEGIC AND OPERATIONAL PLAN 2026 - 2035

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Abbreviations and Acronyms

ABC - Activity-Based Costing

ACA - African Cashew Alliance

ACIAR - Australian Centre for International Agricultural Research

AfCFTA - African Continental Free Trade Area

AFI - African Fine Coffees Association / Association Forcerop (context-dependent)

AfDB - African Development Bank

AIS - Agricultural Innovation Systems

ANCOVA - Analysis of Covariance

AP - Associated Press

ARAA - Agency for Agriculture and Food (ECOWAS)

ARIs - Advanced Research Institutes

AU - African Union

BCR - Benefit-Cost Ratio

BDS - Business Development Services

BR - Biennial Review (CAADP)

CAADP - Comprehensive Africa Agriculture Development Programme

CBI - Centre for the Promotion of Imports from Developing Countries

CBOs - Community-Based Organizations

CGIAR - Formerly the Consultative Group on International Agricultural Research (now a global partnership)

CMD - Cassava Mosaic Disease

COI - Conflict of Interest

CORAF - West and Central African Council for Agricultural Research and Development (Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles)

CPD - Continuing Professional Development

CRM - Customer Relationship Management

DAF - Delegated Authority Framework

DQA - Data Quality Assessment

DSO - Days Sales Outstanding

EC - Electrical Conductivity

ECOWAP - ECOWAS Agricultural Policy

ECOWAS - Economic Community of West African States

EGS - Early Generation Seed

EHS - Environment, Health, and Safety

ERP - Enterprise Resource Planning

EU - European Union

FAAP - Framework for African Agricultural Productivity

FAO - Food and Agriculture Organization of the United Nations

FARA - Forum for Agricultural Research in Africa

FBOs - Faith-Based Organizations

FBV - Farmer-Based Organization

FCR - Feed Conversion Ratio

FFB - Fresh Fruit Bunches (Oil Palm)

FX - Foreign Exchange

GAP - Good Agricultural Practices / Gender Action Plan (context-dependent)

GAPs - Gender Action Plans

GBV - Gender-Based Violence

GEM - Grain Quality Enabler / Generic Extension Material (context-dependent)

GoSL - Government of Sierra Leone

GPS - Global Positioning System

HACCP - Hazard Analysis and Critical Control Points

HQ - Headquarters

HQCF - High-Quality Cassava Flour

HR - Human Resources

IAR4D - Integrated Agricultural Research for Development

ICT - Information and Communication Technology

ICS - Internal Control System (for certification)

IFAD - International Fund for Agricultural Development

IITA - International Institute of Tropical Agriculture

IP - Innovation Platform / Intellectual Property (context-dependent)

IPM - Integrated Pest Management

IREF - Indicator Reference Sheet

ISO - International Organization for Standardization

ISO/IEC - International Organization for Standardization / International Electrotechnical Commission

ISTA - International Seed Testing Association

ITC - International Trade Centre

IVR - Interactive Voice Response

IVS - Inland Valley Swamps

KFTCRC - Kenema Forestry and Tree Crops Research Centre

KHCRC - Kabala Horticultural Crops Research Centre

KPI - Key Performance Indicator

LIMS - Laboratory Information Management System

MAFS - Ministry of Agriculture and Food Security

MCC - Millennium Challenge Corporation

MEL - Monitoring, Evaluation and Learning

MFIs - Microfinance Institutions

MLWERC - Magbosi Land, Water and Environment Research Centre

MoU - Memorandum of Understanding

MRL - Maximum Residue Limit

MSMEs - Micro, Small and Medium Enterprises

MTNDP - Medium-Term National Development Plan

NAIP - National Agricultural Investment Plans

NARC - Njala Agricultural Research Centre

NARS - National Agricultural Research Systems

NDA - Non-Disclosure Agreement

NGOs - Non-Governmental Organizations

NRDS - National Rice Development Strategy

NRM - Natural Resources Management

NTB - Non-Tariff Barrier

OFSP - Orange-Fleshed Sweet Potato

OLM - Outcome Logic Model

O&M - Operations and Maintenance

OP - Operational Plan

OPEX - Operating Expenditure

OHS - Occupational Health and Safety

PPE - Personal Protective Equipment

PPPs - Public-Private Partnerships

PPR - Peste des Petits Ruminants

PSEA - Protection from Sexual Exploitation and Abuse

PVC - Product Value Chain

PWDs - Persons with Disabilities

QA - Quality Assurance

QC - Quality Control

QMS - Quality Management System

QLR - Quarterly Learning Review

QR - Quick Response (Code)

R&D - Research and Development

RAIP - Regional Agricultural Investment Plans

RARC - Rokupr Agricultural Research Centre

RBF - Revolving Bridge Fund

RH - Relative Humidity

RoO - Rules of Origin

SAH - Semi-Autotrophic Hydroponics

SDGs - Sustainable Development Goals

SLA - Service-Level Agreement

SLARI - Sierra Leone Agricultural Research Institute

SLSB - Sierra Leone Standards Bureau

SMEs - Small and Medium Enterprises

SMP - Seed Multiplication Programme

SOPs - Standard Operating Procedures

SPS - Sanitary and Phytosanitary

SRO - Sub-Regional Organization

STI - Science, Technology and Innovation

TAAT - Technologies for African Agricultural Transformation

TBT - Technical Barriers to Trade

TLC - Teko Livestock Research Centre

TLRC - Teko Livestock Research Centre

ToC - Theory of Change

ToT - Training of Trainers

Tralac - Trade Law Centre

UAV - Unmanned Aerial Vehicle

UC Davis - University of California, Davis

UNECA - United Nations Economic Commission for Africa

UNIDO - United Nations Industrial Development Organization

UPS - Uninterruptible Power Supply

USAID - United States Agency for International Development

VAT - Value Added Tax

WACOMP - West Africa Competitiveness Programme

WEF - World Economic Forum

WFP - World Food Programme

WOAH - World Organisation for Animal Health

WTO - World Trade Organization

FOREWORD

Sierra Leone's food systems transformation programme, Feed Salone (2023–2028), reflects a systemic shift in how we approach agriculture. Its objective is clear: to reduce structural food import dependence, strengthen national food security, stabilise foreign exchange exposure, and build a resilient agrifood economy that creates jobs and drives growth. It recognises agriculture as part of an interconnected system in which science, markets, infrastructure, finance, and climate resilience must operate in alignment. Within this system, innovation becomes the catalyst for change and must be applied in practice, strengthening productivity at the farm level and resilience across the food system.

Higher output alone does not deliver transformation. Without strong value chains, farmers remain exposed to losses and price volatility. Feed Salone promotes aggregation, processing, storage, and reliable market linkages to retain value domestically and reduce post-harvest losses. Infrastructure is central to this effort. Public financing is being deployed to de-risk investment and crowd in private capital, particularly within dedicated rice clusters in special production areas.

Agrifood development must attract long-term investment and create employment that outlasts political cycles. Private sector growth is the clearest measure of whether transformation is taking hold.

Policy reform strengthens this foundation. The new Seed Systems Policy improves certification and access to quality varieties while enabling responsible private participation. The regulated application of biotechnology supports higher yields and climate resilience. Clear standards and predictable regulation are essential to attract investment and sustain confidence.

Within this national reform agenda, the Sierra Leone Agricultural Research Institute (SLARI) occupies a central position. SLARI is mandated to generate, adapt, validate, and disseminate agricultural knowledge and technologies across crops, livestock, fisheries, and forestry. Its responsibility extends beyond research output to practical application. Scientific innovation must strengthen productivity, improve farmer incomes, enhance climate resilience, and contribute directly to national competitiveness.

This Strategic and Operational Plan for 2026 to 2035 aligns SLARI's work with Sierra Leone's Medium-Term National Development Plan, 2024 to 2030, and with regional and continental

frameworks including ECOWAS agricultural policy, CAADP commitments, African Union Agenda 2063, the Sustainable Development Goals, and AfCFTA. It reinforces collaboration with research networks such as CORAF and FARA and adopts the Integrated Agricultural Research for Development framework, ensuring that research strengthens entire value chains and food systems rather than isolated commodities.

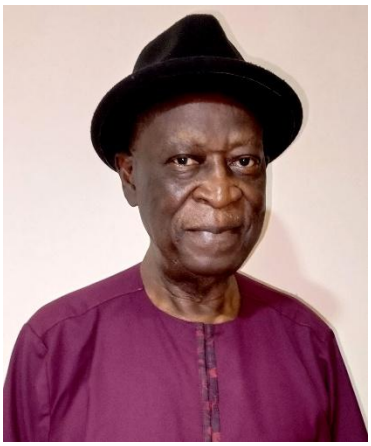
Over the coming decade, SLARI must anchor evidence-based agricultural development. Research must respond directly to constraints within production environments and to opportunities emerging from domestic and regional markets. Innovation must be scalable, commercially relevant, and capable of attracting private participation. Strong partnerships with universities, financial institutions, regional research bodies, and international collaborators will be essential.

SLARI's Vision to establish a resilient, innovation-driven agricultural research system that measurably improves productivity, incomes, and nutrition while preserving natural resources reflects the systemic ambition of Feed Salone. Its Mission to generate demand-led, climate-smart knowledge and responsibly commercialise innovation underscores the discipline required for sustained transformation.

Food systems reform requires persistence, coordination, and scientific rigour. With a strengthened research institution at its core, Sierra Leone is building a resilient and competitive agrifood economy that supports growth, stability, and long-term prosperity.

Dr. Henry Musa Kpaka
Minister of Agriculture and Food Security
Republic of Sierra Leone

PREFACE



Sierra Leone has a long and distinguished history of agricultural research spanning nearly a century. Early institutions such as the West Africa Institute for Oil Palm Research (WAIFOR), Bambawo Forestry Research Station, and the Rice Research Station at Rokupr were pioneers in West Africa. In the 1980s, the government established the National Agricultural Research Coordinating Council (NARCC) to harmonize and coordinate research activities.

Over the years, agricultural research has significantly improved productivity through the development of improved crop varieties—particularly rice, cassava, and sweet potato—along with better management practices. The long-term impacts of agricultural research are reflected in three key areas: improved productivity and resource efficiency enhanced rural livelihoods, and environmental sustainability.

An Act of Parliament established the Sierra Leone Agricultural Research Institute (SLARI) in 2007 as a semi-autonomous agency to revitalize agricultural research. A Strategic Plan (2012–2021) was developed to align with government priorities. However, implementation faced systemic challenges, including weak seed system linkages, limited adoption of technologies, inadequate laboratory and infrastructure investment, weak research-extension-private sector coordination, and emerging climate-related constraints.

In response, the SLARI Act 2023 was enacted to strengthen governance, management, innovation, commercialization, and outreach functions. This reform necessitated the revision of SLARI's Strategic and Operational Plans. The revised Strategic Plan repositions SLARI as a demand-led, climate-smart, and market-oriented institution focused on generating technologies, promoting adoption, and supporting value-chain actors.

The new strategy identifies five key result areas to drive agricultural transformation and support the Government's Feed Salone Initiative: 1. Reliable seed and planting material supply; 2. Adoption of validated, climate-smart technology packages; 3. Improved product quality and post-harvest performance; 4. Strengthened centre capability and delegated delivery; 5. Inclusive participation and youth pathways.

The Plan emphasizes strong partnerships with farmers, private sector actors, and other value-chain stakeholders to build a commercially competitive agricultural sector. It provides a ten-year framework that will guide the development of detailed five-year operational plans.

The revised Strategic Plan is the result of extensive stakeholder consultations and collaborative efforts. Appreciation is extended to the Ministry of Agriculture and Food Security, SLARI leadership, technical partners, and all stakeholders who contributed to the revision. The document aims to serve as a practical and responsive roadmap for agricultural research for development in Sierra Leone.

Chief Dr. Alfred G.O. Dixon

Chair, SLARI Council

ACKNOWLEDGEMENTS

Agricultural research has played a significant role in improving agricultural productivity and rural development in Sierra Leone. To strengthen this role, the Government established the Sierra Leone Agricultural Research Institute (SLARI) through an Act of Parliament as the national body responsible for agricultural research and technology generation for the farming, fishing, and forestry sectors. The SLARI Act reflects the Government's recognition of research, innovation, commercialization, and agribusiness development as critical drivers of the Feed Salone Initiative and national agricultural transformation.

SLARI currently operates through six functional research centres: Njala Agricultural Research Centre (**NARC**), Rokupr Agricultural Research Centre (**RARC**), Kabala Horticultural Crops Research Centre (**KHCRC**), Teko Livestock Research Centre (**TLRC**), Kenema Forestry and Tree Crops Research Centre (**KFTCRC**), and Magbosi Land, Water and Environment Research Centre (**MLWERC**). A seventh research centre, Freetown Fisheries Research Centre **(FFRC),** is yet to be fully operational.

The revised SLARI Strategic Plan is uniquely aligned with national, regional, and continental frameworks, including CORAF/WECARD, FARA, CAADP, NEPAD, the Sustainable Development Goals (SDGs), Agenda 2063, AfCFTA, ECOWAS/ECOWAP, and Sierra Leone's Feed Salone and the Medium-Term National Development Plan (MTNDP 2024–2030). This alignment reaffirms SLARI's commitment to reducing poverty, eradicating hunger, and promoting economic development through agriculture.

To deliver on its five institutional results, SLARI has adopted a programme-based approach and reorganized its research into six long-term strategic programme areas: Root, Tuber and Grain Legume Crops; Cereal Crops; Horticultural Crops; Livestock; Forestry and Tree Crops; and Land, Water and Environment. These programmes are designed to enhance innovation, strengthen value chains, empower stakeholders, and ensure research remains responsive to national priorities and farmers' needs.

Implementation of the Strategic Plan will be guided by a five-year Operational Plan (2026–2030), supported by a Theory of Change, Outcome Logic Model, and centre-specific strategies extending to 2035 and beyond. The approach emphasizes nationally coordinated, product value chain-based projects, joint planning, cross-centre collaboration, and stakeholder participation.

The revision of the Strategic Plan was highly participatory and benefited from the contributions of numerous institutions and individuals. Special appreciation is extended to the Minister of Agriculture and Food Security and senior ministry officials; the International Institute of Tropical Agriculture (IITA) and the Food Systems Resilience Programme (FSRP); SLARI Council leadership past and present; Mr. Magnus Mordu Conteh and his team for technical leadership; Rev. Dr. Prince E. Norman; SLARI management and staff; and all stakeholders who contributed to the successful completion of the Strategic Plan.

Dr. Abdul Rahman Conteh

Director General, SLARI

Chapter 1 - Introduction and Rationale

SLARI is mandated to generate, adapt and promote agricultural technologies that respond to national priorities and the real needs of farmers, processors, input suppliers and public institutions. Over 2015–2024, SLARI's centres delivered important trials and knowledge products, yet the period also revealed system-level constraints that limited scale and sustained impact. Chief among these were under-investment in Laboratories, field infrastructure and information systems; highly centralised decision-making that slowed procurement and partnerships; thin and often ad-hoc linkages among research, extension and private actors; and an incomplete connection between early-generation seed (EGS) production and certified seed supply. In addition, participation by users was frequently episodic rather than institutionalised, producing weak feedback loops and uneven adoption in some value chains.

The case for change is clear. To meet Feed Salone ambitions and wider national development goals, SLARI must shift from a project-by-project posture to a sustained, portfolio approach that is demand-led, market-aware, climate-smart and digitally enabled. That requires rebuilding core scientific and data assets; delegating appropriate authority to centres within a strong ex-post assurance framework; making SLARI's role in the seed system explicit—leading EGS (breeder/foundation) while crowding-in licensed multipliers for certified seed; and formalising structured engagement with producers, SMEs and local government through innovation platforms. These adjustments will increase the throughput, quality and relevance of research, while shortening the cycle from knowledge to adoption and enterprise growth.

Accordingly, this Strategy is designed around three mutually reinforcing anchors. First, a Participatory Framework governs the entire process: priorities are co-defined with users; protocols are peer-reviewed with partners; and results are validated in the field through community demonstrations and feedback scorecards, with inclusion standards that ensure women and youth leadership. Second, an Outcome Logic Model (OLM) provides the organising spine of the Strategic Plan and the Operational Plans: a transparent

chain from impact to outcomes, outputs and activities, with measurable indicators and indicator reference sheets to assure traceability and accountability to funders and government. Third, the IAR4D/Agricultural Innovation Systems (AIS) mindset guides implementation: multi-actor problem-solving, attention to markets and policy, and incentives that favour system performance (adoption, enterprise growth, resilience) over narrow counts of research outputs.

This combination—participatory process, logic-model discipline and systems orientation—positions SLARI to deliver credible, scalable results over the next decade. It also aligns internal governance and resourcing (delegation, performance compacts, MEL, open reporting) with external expectations for relevance, quality assurance and value for money. The result is a Strategy grounded in local reality from the first meeting, logically structured for monitoring and investment decisions, and engineered to catalyse change across the wider agricultural innovation system.

Chapter 2 – Profile of SLARI

The ***Sierra Leone Agricultural Research Institute Act, 2023*** repeals and replaces the 2007 Act and strengthens SLARI's governance, management, community outreach, innovation, business development and commercialization functions. Under the 2023 Act, SLARI is established as the national agricultural technological research body, responsible for conducting, facilitating, promoting, coordinating and regulating the national food system through a Food Systems Research Platform that convenes public and private stakeholders to identify challenges, agree solutions and support agricultural transformation.

The Act 2023 empowers SLARI to constitute committees of **Research Centres** and manage its constituent centres. SLARI currently operates a country-wide network that includes: Njala Agricultural Research Centre (NARC); Rokupr Agricultural Research Centre (RARC); Kabala Horticultural Crops Research Centre (KHCRC); Teko Livestock Research Centre (TLRC); Kenema Forestry and Tree Crops Research Centre (KFTCRC); Magbosi Land, Water and Environment Research Centre (MLWERC); and Freetown Fisheries Research Centre (FFRC).

SLARI's functions include, inter alia:

- ***Policy intelligence and advice:*** Provide information to Government and stakeholders to shape agricultural policies for poverty alleviation, food security, improved livelihoods and sustainable natural resource management; produce annual reports and medium-/long-term research plans and strategies.
- ***Research programming:*** Formulate agricultural research policies and programmes aligned with national vision and stakeholder priorities; conduct basic and applied research across the food and agriculture system, including:
    - food and cash crop production; livestock and in-land fish production; forestry and tree crops;
    - land, water and environmental management systems;
    - value addition and post-harvest technologies for food and non-food products;

- food science, nutrition and related technologies; soil, plant and animal health and biosafety;
- breeding, genetics, genetic resources and biotechnology; environmental conservation;
- digital and other emerging technologies in agriculture;
- socio-cultural, economic and policy analysis of agricultural systems; and
- commercialization, agribusiness, agripreneurship and agro-industrialisation processes.

- ***Knowledge access and utilisation:*** Facilitate equitable access to research information, resources and technologies; promote the utilisation of agricultural research and knowledge systems; disseminate modern agricultural innovations and technologies to stakeholders; and monitor and evaluate the adoption, implementation and impact of agricultural research on productivity.

- ***Extension linkages and capacity:*** Establish strong working relationships with public and private extension agencies for technology transfer; strengthen collaboration among research, extension, farmers, policy-makers and other stakeholders; and build capacity of extension staff, value-chain service providers and learning institutions.

- ***Registers, data and open science:*** Maintain registers of research scientists, projects and results; provide access to research findings and facilities in line with law and policy; and uphold standards for data stewardship and ethics.

- ***Partnerships and representation:*** Establish strong links with national, regional and international research institutions and agencies involved in science and technology development and transfer; represent Sierra Leone in regional and international fora.

- ***Finance, commercialization and resource mobilisation:*** Process and submit annual funding estimates to Government; mobilise human, financial and capital resources from donors, private sector and within the Institute; establish, maintain and operate income-generating entities to commercialize research outputs; charge fees for services where appropriate; and manage grants and partnerships consistent with national research priorities and the Institute's Strategic Plan.

- Performance and incentives: Build a performance-based system for researchers that recognises scientific publications and resources generated through grants and partnerships.

2.4 Vision, Mission, Values and Principles

Vision. A resilient, innovation-driven agricultural research system that measurably improves agricultural productivity, incomes, and nutrition while preserving the natural resource base and taking advantage of technological advancements.

Mission. To generate, adapt, validate and broker demand-led, climate-smart agricultural knowledge and technologies; commercialize responsibly under clear public-interest guardrails; provide timely evidence for agricultural policy; and build national research capacity in line with Sierra Leone's development priorities.

2.5 Guiding Core Values

Decisions and actions in SLARI are consistently based on a set of clear principles outlined here as the institutional Guiding Core Values. The institutional Core Values guide actions at all levels when choices are not clear or when there is a gap between intention and reality. The Institutional Guiding Core Values that SLARI and its stakeholders and partners hold in common and endeavour to put into practice while performing their functional obligations include the following:

(i) Scientific excellence, innovativeness and ethics: SLARI believes that the stakes in Agricultural Product Value Chain approach to research are extremely high in terms of the investments that are necessary for meaningful outcomes and is, therefore, committed to scientific excellence, innovativeness and adherent to ethics and standards so as to ensure that all research work and recommendations made to stakeholders emanate from sound evidence based on rigorous scientific findings of the highest quality possible.

(ii) Impact, performance and service orientation: SLARI will remain focused on integrated agricultural research for development by ensuring that all research activities undertaken or promoted are demand-driven. SLARI will achieve this through building and maintaining a culture that is based on outcome mapping of research for better impact orientation and effective knowledge and information management as well as quality service delivery as the hallmark of the non- research part of the institution so as to meet and exceed clients' expectations.

(iii) Partnerships for collaborative advantage and synergies: SLARI will pursue productive and beneficial partnerships and strategic alliances with clearly defined roles, responsibilities, governance and supportive mechanisms so as to ensure effective collaboration and synergies that have a direct bearing on finding innovative solutions to major agricultural sector problems. In this regard, SLARI is committed to working with broad stakeholder categories and partners.

(iv) Respect for staff, clients and stakeholders and partners diversity: SLARI recognizes that staff and stakeholders are critical resource in achieving its Mission and is, therefore, committed to respecting staff and stakeholder diversity with emphasis on mutual respect for individuals and assurance on equitable recognition of their contribution. In this regard, SLARI is committed to ensuring effective integration and teamwork across levels, disciplines, gender, timeframes and space as well as timely and quick response to all staff and stakeholders' concerns.

(v) Integrity, transparency, accountability and cost-effectiveness: SLARI is committed to upholding virtues of integrity through honesty, fairness and professionalism in all its operations while remaining committed to effective and efficient utilization of all resources entrusted to the Institute in the most transparent, accountable and cost-effective manner.

Chapter 3 - Situational Analysis

3.1 Global Policies and Plans

SLARI's contribution to the achievement of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) in Sierra Leone is an integral part of the national and global effort to eradicate poverty, protect the planet, and ensure prosperity for all. Achieving the SDGs is inherently connected to transforming Sierra Leone's agricultural sector, since it is one of the largest employers and sources of food, livelihoods and economic activity in the country. SLARI's innovation and research mandate is not just a national endeavour but is also directly connected to the global effort represented by the 2030 Agenda and the 17 SDGs.

SLARI's core areas of focus, including generating climate-resilient crop varieties, improving seed systems, and developing improved agronomic practices, aligns directly with the objectives of SDG 2 (Zero Hunger), specifically Targets 2.3 and 2.4, aimed at doubling the agricultural productivity and incomes of small-scale food producers; and ensuring sustainable food production systems.

In addition to SDG 2, SLARI's strategic outcomes have catalytic effects on many other important goals:

SDG 1 (No Poverty): Increasing the productivity of smallholder farmers and their ability to stabilize their harvests through the use of climate resilient varieties; and supporting the development of strong value chains can significantly increase the income levels of smallholder farmers, and therefore reduce extreme poverty (Target 1.1); and build resilience to environmental and economic shocks (Target 1.5).

SDG 5 (Gender Equality): The Institute's explicit inclusion framework, Center-level GAPs and targeted pathways for women in agriculture directly address SDG 5. The focus on ensuring women's access to productive resources, knowledge and leadership roles, directly addresses Target 5.a, undertaking reforms to give women equal rights to economic resources.

SDG 8 (Decent Work and Economic Growth): SLARI's commercialization efforts; and support for agri-SMEs; and the establishment of youth internships and apprenticeships in the seed, mechanization and processing sectors directly support Target 8.2 (Diversification and Innovation for Economic Growth); and Target 8.6 (Promotion of Youth Employment).

SDG 13 (Climate Action): All of the strategic orientations around "climate smart" technologies — including drought tolerant seeds; water efficient irrigation; and soil conservation practices — represent SDG 13's call for resilience and adaptive capacity to climate related hazards (Target 13.1).

SDG 15 (Life on Land): SLARI's work on sustainable land management; soil health through the MLWERC; and promoting agroforestry and conservation agriculture directly support the goal of combating desertification and restoring degraded lands (Target 15.3).

Implications for SLARI

For SLARI, the SDG framework is not only a reporting requirement but also a strategic lens through which to validate and amplify its national role. This means that SLARI should:

SDG-Aligned Targeting: SLARI's MEL System Should Explicitly Map Core Indicators to Relevant SDG Targets and Indicators. This Will Allow Sierra Leone to Credibly Report Progress On Goals Like SDG 2 and SDG 13 Using Data Generated from SLARI's Research and Adoption Studies. Partnership Mobilization: Articulating SLARI's work through the SDG framework increases SLARI's appeal to development partners and international financiers whose mandates are aligned with the 2030 Agenda. The SDG Framework Provides A Common Language for Collaboration and Resource Mobilization.

Integrated Programming: The Interconnected Nature of the SDGs Reinforces the Need for SLARI's Integrated Approach. For Example, A Project on Rice Varietal Development (SDG 2) Must Consciously Consider Its Nutritional Impact (SDG 2); Implications for Women's Labour and Income (SDG 5); and Environmental Footprint (SDG 13 & 15).

Policy Advocacy: SLARI's Role in Providing "Timely Evidence for Agricultural Policy" Should Include Analysis of How Proposed Policies and Investments Will Advance or Hinder Progress Toward Multiple SDGs; Ensuring A Coherent National Development Strategy.

By anchoring its 2026-2035 Strategy within the SDG Framework, SLARI moves beyond a narrow productivity focus to embrace its role as a cornerstone of sustainable development in Sierra Leone. SLARI's success in delivering demand-led, climate-smart research will be a significant determinant of the country's ability to meet its commitments under the 2030 Agenda; demonstrating how national agricultural innovation is a prerequisite for global sustainable development.

3.2 Regional Policies and Plans

3.2.1 Post-Malabo Agenda (Kampala Declaration 2026–2035) and the 2014–2025 Malabo Commitments

At the continental level, the African Union's agricultural policy framework continues to be anchored in the Comprehensive Africa Agriculture Development Programme (CAADP). Adopted in 2014, Malabo committed African governments to doubling productivity, ending hunger, halving poverty, tripling intra-African trade in agricultural commodities, and enhancing resilience. Progress has been assessed through the CAADP Biennial Review (BR) process, which provides a scorecard mechanism for Member States. The most recent 4th Biennial Review (covering 2015–2022, released in 2024) showed that most Member States, including those in West Africa, are not on track to achieve all Malabo commitments by 2025, particularly on investment financing, resilience, and inclusion. The AU has therefore issued a Post-Malabo roadmap to guide the transition, urging countries to use 2025 as a year of intensified delivery, lesson learning, and alignment to the next decade's priorities.

The most recent development is the adoption of the CAADP Strategy and Action Plan 2026–2035 (Kampala Declaration), which marks a deliberate shift from a narrow focus on production growth towards a more holistic agrifood systems transformation. This new horizon emphasizes climate resilience, digitalization and science, technology and innovation (STI), nutrition-sensitive interventions, and the empowerment of women and youth in agriculture. It also places stronger weight on market access and competitiveness, reflecting the new realities of regional integration through the AfCFTA and the need for African producers to compete effectively in domestic and regional value chains. For Sierra Leone, and for SLARI in particular, the Post-Malabo framework signals that agricultural research and development (R&D) must not only generate productivity-enhancing technologies but also address resilience to climate shocks, ensure the quality and reliability of seed systems, strengthen compliance with sanitary and phytosanitary (SPS) and technical barriers to trade (TBT) standards, and scale digital advisory services that connect knowledge to farmers in real time.

Implications for SLARI are threefold. First, SLARI should map its outcome targets to the pillars of the Kampala Declaration, ensuring that research and innovation pipelines directly contribute to systemic transformation outcomes such as resilience, gender/youth empowerment, and competitiveness. Second, it should continue to report against Malabo Biennial Review indicators through 2025, both to fulfill Sierra Leone's commitments and to position itself as a credible data and evidence provider for national reporting. Third, SLARI must prioritize research-to-adoption pathways, reliable seed systems, resilience traits in

breeding and management, and digital knowledge services. By doing so, SLARI will demonstrate continuity, credibility, and forward alignment in contributing to Sierra Leone's national agricultural transformation agenda within the continental framework.

3.2.2 ECOWAP (rolling), Regional Investment Priorities, and Shock/Trade Instruments

The Economic Community of West African States (ECOWAS) continues to implement the ECOWAS Agricultural Policy (ECOWAP), which serves as the regional companion to the AU's CAADP agenda. ECOWAP remains the central policy framework for guiding food and agricultural development across the subregion, with objectives to ensure food sovereignty, reduce poverty, and integrate agriculture into regional markets. Implementation occurs through rolling Regional Agricultural Investment Plans (RAIP) and National Agricultural Investment Plans (NAIP), which provide programmatic alignment between regional priorities and member states' interventions. Current operational priorities include the Rice Offensive, which seeks to close the production-consumption gap in West Africa, and the Regional Food Security Reserve, which provides a buffer mechanism for addressing food shocks and stabilizing prices across the region (ECOWAS, 2022; ARAA, 2023). For Sierra Leone, where rice is both a staple and a political crop, ECOWAP offers a key alignment framework for varietal development, seed system strengthening, and regional trade prospects in roots and tubers.

ECOWAS also recognizes that trade and standards are critical to unlocking the potential of regional agriculture under ECOWAP. While the AfCFTA provides the broader continental framework for tariff reduction and market integration, in practice, non-tariff barriers (NTBs), weak implementation of sanitary and phytosanitary (SPS) measures, and uneven development of technical barriers to trade (TBT) continue to constrain cross-border flows of seeds and food products (UNECA, 2024; WEF, 2023). ECOWAS has therefore scaled up capacity initiatives to operationalize ECOWAP, strengthen quality infrastructure, and equip member states with the tools to comply with SPS/TBT standards. These include training Laboratories on international testing protocols, promoting traceability and labeling systems, and supporting corridor-based trade facilitation for agri-food commodities (ARAA, 2023).

Implications for SLARI. For Sierra Leone to maximize benefits from ECOWAP and regional integration, SLARI should (i) align its varietal pipelines and seed certification systems with ECOWAP's investment priorities, particularly the Rice Offensive; (ii) contribute data and evidence to support Sierra Leone's participation in the Regional Food Security Reserve; and (iii) embed SPS/TBT-ready protocols into its research, Laboratory methods, and extension outputs, ensuring that new varieties and certified seed meet traceability and labeling requirements necessary to unlock ECOWAS and AfCFTA markets. In doing so, SLARI will position itself not only as a national agricultural research institute but also as a credible regional player feeding into West Africa's integrated agri-food system.

3.2.3 AfCFTA Market Expansion, NTB Resolution and Rules of Origin (RoO)

The African Continental Free Trade Area (AfCFTA), now fully in force, represents the largest free trade area in the world in terms of participating countries. As of 2025, implementation has reached a critical stage: Rules of Origin (RoO) coverage extends to more than 90 percent of tariff lines, establishing the foundation for preferential trade across the continent (Tralac, 2025). In addition, Non-Tariff Barrier (NTB) reporting and resolution mechanisms are operational, allowing governments and private sector actors to flag and

resolve obstacles to trade in real time (UNECA, 2024). Despite these advances, progress remains uneven, with tariff schedule implementation, standards harmonization, and trade facilitation measures lagging in some countries. The AU and regional economic communities, including ECOWAS, have therefore urged member states in 2025 to prioritize full operationalization of AfCFTA commitments by reducing agreed tariffs, eliminating NTBs, and aligning national policies with continental frameworks (UNECA, 2024; Tralac, 2025).

For Sierra Leone, and for SLARI, the AfCFTA offers new opportunities to expand markets for agricultural products beyond the ECOWAS region. However, access to these markets depends not just on the existence of legal trade frameworks but on the quality and compliance of agri-food products. This includes meeting stringent requirements related to varietal quality, SPS (Sanitary and Phytosanitary) measures, TBT (Technical Barriers to Trade), traceability, and labelling (Tralac, 2025). Strengthening Sierra Leone's Laboratory systems and data flows—covering seed health, soil and fertilizer analysis, pesticide residue monitoring, and food safety testing—is therefore essential. The integration of Laboratory Information Management Systems (LIMS) and digital traceability tools will directly support firms and farmer groups in meeting certification requirements, ensuring that Sierra Leone's agricultural commodities are competitive in intra-African markets. For SLARI, aligning its research outputs, seed systems, and QA protocols with AfCFTA compliance needs will be central to enabling Sierra Leonean producers to seize these emerging opportunities.

3.2.4 Forum for Agricultural Research in Africa (FARA) and West and Central Africa (CORAF)

At the continental level, the Forum for Agricultural Research in Africa (FARA) serves as the apex body for agricultural research and innovation. FARA is responsible for setting continental research priorities and for providing strategic guidance to SROs such as CORAF. Its frameworks, including the Framework for African Agricultural Productivity (FAAP) and the Science Agenda for Agriculture in Africa (S3A), remain central

reference points. FAAP emphasizes farmer-centered innovation, strengthened extension-research linkages, capacity building, and funding alignment (FARA, 2006). The S3A, adopted in 2014, articulates a long-term vision for harnessing science, technology, and innovation to drive Africa's agricultural transformation, with a strong focus on climate-smart agriculture, digital knowledge platforms, and public–private partnerships (FARA, 2014).

In West and Central Africa, the West and Central African Council for Agricultural Research and Development (CORAF) remains the key sub-regional organization (SRO) for coordinating agricultural research, technology dissemination, and capacity development under the auspices of FARA. The CORAF Strategic Plan 2018–2027 provides the framework for action and prioritizes four strategic themes: (i) sustainable agricultural productivity, (ii) agribusiness and markets, (iii) resilience, climate change and risk management, and (iv) policy, institutions and capacity strengthening (CORAF, 2018). CORAF operationalizes this agenda through programmes such as CAADP-XP4, funded under the EU DeSIRA initiative, which strengthens the capacities of National Agricultural Research Systems (NARS) to deliver climate-relevant science, foresight analysis, partnerships, and evidence uptake (CORAF, 2022). This provides Sierra Leone, through SLARI, with an opportunity to integrate into regional research networks, benefit from shared services (e.g., seed systems, lab QA, foresight tools), and attract regional co-financing.

Implications for SLARI. For Sierra Leone, this means SLARI should deepen its engagement with CORAF networks on seed systems, Laboratory quality assurance, standard operating procedures (SOPs), and climate-relevant R&D. Participation in foresight and policy dialogues will enable SLARI to anticipate emerging challenges and tailor research accordingly. At the same time, aligning SLARI's Innovation Platforms and digital knowledge products with FAAP and S3A principles will accelerate technology adoption, strengthen its regional positioning, and attract investment through continental and sub-regional mechanisms. By embedding itself firmly within CORAF and FARA frameworks, SLARI can reinforce its credibility as both a national research institute and a regional player in West Africa's agricultural transformation.

3.3 National Policies and Plans

3.3.1 Institutional Framework: SLARI Act 2023 (in force)

The Sierra Leone Agricultural Research Institute Act, 2023 repeals and replaces the original 2007 Act, providing a modernized legal framework for agricultural research and innovation (GoSL, 2023). The new Act strengthens SLARI's governance and expands its mandates beyond research to include commercialization, business development, and intellectual property management. It explicitly empowers SLARI to engage in public–private partnerships (PPPs), generate revenue from cost-recovery services, and reinvest in institutional capacity.

Key provisions of the 2023 Act emphasize accountability and innovation. SLARI is now mandated to establish performance compacts for its centres, implement quality assurance systems and standard operating procedures (SOPs), and mainstream revenue generation mechanisms to support long-term sustainability. The Act also underpins SLARI's outreach functions, encouraging closer engagement with farming communities, private actors, and development partners. This legal framework is therefore a

cornerstone of SLARI's revised strategy for 2026–2035, aligning governance structures with the demands of a modern research and innovation ecosystem.

3.3.2 Medium-Term National Development Plan (MTNDP) 2024–2030

The Medium-Term National Development Plan (MTNDP) 2024–2030 is Sierra Leone's overarching framework for national development and the successor to the MTNDP 2019–2023, which had prioritized "Education for Development." The new plan lays out the government's strategic priorities to 2030, aligning them with the Sustainable Development Goals (SDGs), the African Union's Agenda 2063, and continental and regional integration frameworks such as the AfCFTA and ECOWAP. At its core, the plan seeks to accelerate inclusive and sustainable economic growth, deepen human capital development, promote private-sector–led transformation, and strengthen resilience to climate and economic shocks (GoSL, 2024).

A central feature of the MTNDP is the identification of the government's "Big Five Game Changers", which serve as catalytic levers to unlock progress across sectors. These include: (i) Feed Salone (food security and agrifood system transformation), (ii) Human Capital Development, (iii) Youth Employment Schemes, (iv) Revitalization of the Public Service, and (v) Technology and Infrastructure Modernization. Among these, Feed Salone is particularly significant for the agricultural sector and for SLARI, as it provides the strategic entry point for food security, import substitution (especially in rice), and agrifood competitiveness.

The MTNDP also emphasizes the need for climate resilience and environmental sustainability, embedding policies for adaptation, sustainable natural resource use, and disaster risk reduction. In parallel, the plan prioritizes digital transformation and e-governance as cross-cutting enablers, aiming to modernize service delivery, improve transparency, and expand access to digital platforms for both public and private actors. These commitments reflect Sierra Leone's intention to build a diversified economy capable of withstanding external shocks and positioning itself competitively within regional and global markets (GoSL, 2024).

For SLARI, the MTNDP provides a clear mandate to align research and innovation with national development goals. Specifically, the plan reinforces the importance of research-to-adoption pipelines that ensure innovations reach farmers and SMEs, the strengthening of standards and quality infrastructure (Laboratories, accreditation, LIMS, SPS/TBT compliance), and the promotion of public–private partnerships (PPPs) in seed systems, mechanization, and processing. By embedding its strategy within the MTNDP framework, SLARI can demonstrate direct contributions to the Big Five priorities and position itself as a key enabler of Sierra Leone's transformation agenda.

3.3.3 "Feed Salone" National Agrifood Strategy (launched 2023; ongoing)

The Government of Sierra Leone launched Feed Salone in 2023 as the national flagship strategy for food security and agrifood system transformation. It is the anchor programme of the Medium-Term National Development Plan (MTNDP) 2024–2030, reflecting the government's "Big Five Game Changers." The initiative was conceived in response to the country's persistent dependence on food imports—particularly rice, which accounts for over half of household caloric intake and a large share of the import bill. Feed Salone therefore places domestic rice self-sufficiency and import substitution at its core, while also targeting productivity gains across other priority crops (such as cassava, maize, and vegetables), livestock

and fisheries. The programme is expected to reduce Sierra Leone's structural food trade deficit, increase resilience to global price shocks, and generate jobs through value-chain upgrading and private-sector participation (Government of Sierra Leone, 2023a; 2024).

The strategy sets out a broad set of priorities to transform Sierra Leone's agrifood sector. These include the reliability of seed systems, ensuring consistent flows from early generation seed (EGS) through to certified seed production, distribution, and adoption. It promotes expanded access to inputs and finance—addressing barriers that constrain smallholders, especially women and youth, from scaling productivity. Equally important is a focus on mechanization and irrigation, particularly the rehabilitation of inland valley swamps (IVS), which hold major potential for increasing rice yields. Feed Salone also emphasizes post-harvest management and processing, recognizing that large productivity gains are often lost due to poor storage, handling, and processing capacity. Enhancing market linkages and facilitating private investment across the value chain form part of the strategy's broader effort to commercialize agriculture.

Beyond farm-level interventions, Feed Salone prioritizes investments in quality infrastructure—including Laboratories, testing and certification systems, and traceability mechanisms—to meet both national food safety standards and regional/continental trade requirements under ECOWAS and AfCFTA. A parallel thrust is the scaling of digital advisory services, using ICT platforms to disseminate agronomic recommendations, market information, and weather/climate advisories to farmers in real time. This reflects the government's recognition that digitalization is central to modern agricultural service delivery and is consistent with broader MTNDP objectives on digital transformation.

For SLARI, Feed Salone provides a clear policy mandate and alignment framework. SLARI is expected to generate and validate varietal pipelines for rice and other staples, ensuring that stress-tolerant and high-yielding varieties are available and accessible. Its role extends to establishing validation networks and supporting farmer adoption through demonstration plots and participatory research. Feed Salone also places SLARI at the center of public–private partnerships (PPPs), particularly in seed production, mechanization services, and processing technologies. In addition, SLARI's Laboratory systems, QA

protocols, and digital knowledge products will be instrumental in ensuring that Sierra Leone's agrifood commodities meet both domestic and regional standards. In this way, SLARI's research outputs and institutional strengthening directly contribute to the flagship's core outcomes of food security, poverty reduction, and agrifood competitiveness.

3.3.4 Seed and Input Systems: Roadmaps and Emerging Policies

Recognizing that seed system reliability underpins national food security, the Government of Sierra Leone and its partners developed a Seed Roadmap (2023) as part of the Transforming African Agricultural Technologies (TAAT) platform. The roadmap clearly delineates institutional roles: the Ministry of Agriculture and Food Security (MAFS) provides overall policy direction; the Seed Multiplication Programme (SMP) focuses on bulk seed production; the National Federation of Farmers of Sierra Leone (NaFRA) and private multipliers expand certified seed delivery; and regulatory agencies ensure compliance and quality control. The roadmap highlights investment priorities across the chain—from breeder and foundation seed (EGS) through to certified seed—underscoring the importance of research and extension systems in ensuring timely availability and adoption (TAAT, 2023).

In parallel, work is underway to update the National Seed Policy and to strengthen the Seed Certification and Regulatory Agency, advancing a more enabling environment for private-sector participation in seed multiplication, distribution, and trade. These reforms are designed to align with both Feed Salone's seed system priorities and ECOWAP's regional integration framework, ensuring Sierra Leone's seed sector contributes to regional food security objectives. They also emphasize the need for quality assurance (QA) protocols, accredited Laboratory methods, and Laboratory Information Management Systems (LIMS) to ensure traceability and compliance with SPS/TBT standards for cross-border trade.

These efforts align with Feed Salone and ECOWAP priorities. The policy and institutional environment validates SLARI's central role in **producing breeder and foundation seed**, conducting **seed health and QA testing**, and developing **SOPs and digital traceability systems** that link Laboratory data to certification and advisory services. By anchoring its seed research in the national roadmap and policy framework, SLARI can strengthen its relevance to smallholders, private seed companies, and regional markets.

3.3.5 Knowledge, Laboratories and Standards (SPS/TBT)

Unlocking the benefits of regional and AfCFTA markets requires Sierra Leone to prioritize Sanitary and Phytosanitary (SPS) and Technical Barriers to Trade (TBT) compliance. Current policy frameworks—including the Feed Salone strategy and the MTNDP 2024–2030—highlight the need to develop robust quality infrastructure that can guarantee the safety, reliability, and traceability of agricultural products (MAFS, 2023; GoSL, 2024). This involves investment in functional Laboratories for seed health testing, soil and fertilizer analysis, pesticide residue monitoring, and food safety. Alongside this, the government has prioritized method standardization and the adoption of Laboratory Information Management Systems (LIMS) to improve data integrity, interoperability, and real-time linkage with advisory services.

Digital innovations also play a critical role. Tools such as the E-Extension Framework allow evidence-based recommendations to be scaled to farmers, bridging the gap between Laboratory results, research findings, and on-farm practices. By integrating these systems, Sierra Leone aims to create a seamless chain from

research to adoption, ensuring that farmers and agri-SMEs can meet both domestic food-safety standards and the more demanding protocols required for access to ECOWAS and AfCFTA markets. For SLARI, these instruments should not only feature in its institutional strategy but also be embedded in centre-level scorecards and performance compacts, positioning the Institute as a backbone of Sierra Leone's SPS/TBT readiness (Feed Salone Secretariat, 2024).

3.3.6 Delivery Compacts and Donor Alignment (select)

Sierra Leone is increasingly aligning its agricultural investment frameworks with delivery compacts and donor-driven platforms. Notably, the country signed onto the Food and Agriculture Delivery Compact under the Africa Food Summit (Dakar 2) process, which identifies investment pipelines for scaling food and agrifood system transformation. The Compact emphasizes irrigation expansion, logistics and storage development, energy provision for agro-processing, and private-sector participation, thereby directly complementing Feed Salone's flagship objectives (AfDB, 2023).

At the same time, major development partners are financing complementary operations. For example, the African Development Bank (AfDB) is supporting value-chain financing and agribusiness corridors, the International Fund for Agricultural Development (IFAD) is investing in rural transformation and smallholder commercialization, and the World Food Programme (WFP) is implementing resilience and school-feeding programmes with upstream demand for local production. Beyond agriculture, the Millennium Challenge Corporation (MCC) is financing energy sector reforms, which—by improving power reliability—will reduce costs for processing and cold-storage investments (Reuters, 2024).

For SLARI, these delivery compacts and donor initiatives present opportunities to position itself as a critical evidence provider. The Institute's research on varietal performance, cost-effectiveness of production packages, and climate-risk analysis can guide investment prioritization and policy decisions within these platforms. By integrating into the monitoring and learning functions of delivery compacts, SLARI can enhance its relevance and secure partnerships that support co-financing and scaling of its research outputs.

3.4 Challenges Facing the Sierra Leone Agricultural Sector

3.4.1 Structural Constraints

Agriculture in Sierra Leone is overwhelmingly **smallholder-based**, with the majority of farmers cultivating less than two hectares of land under rain-fed conditions. This structural profile contributes to low levels of capital accumulation and **chronically low labour productivity**. Irrigation is particularly underdeveloped: less than 1 percent of cropped land is irrigated, placing Sierra Leone among the lowest globally and leaving production highly vulnerable to rainfall variability. Mechanization services are sparse and concentrated in a few urban or peri-urban centers, while rural feeder roads and storage facilities are insufficient, contributing to high post-harvest losses and wide seasonal price swings. Recent flagship policies, including **Feed Salone**, have explicitly identified the absence of productivity-enhancing infrastructure—particularly **inland valley swamp (IVS) rehabilitation, mechanization services, and post-harvest storage systems**—as binding constraints to yield growth, marketable surpluses, and competitiveness (GoSL, 2023).

3.4.2. Seed Systems and Input Markets

Seed systems continue to face serious reliability challenges. The flow of early generation seed (EGS—breeder and foundation seed) into certified seed production is inconsistent, undermining the timely supply of improved varieties to farmers. Certification and regulatory capacity remain limited, while the private seed multiplication and distribution sector is still at a formative stage. Beyond seeds, input markets for fertilizers, agro-chemicals, and other inputs are constrained by currency depreciation, price volatility, and working-capital shortages, all of which restrict affordability and access. Last-mile distribution is especially problematic outside major district centers, leaving smallholders without timely access to essential inputs. These systemic weaknesses are repeatedly highlighted in government flagship frameworks and donor-supported agricultural value-chain projects, reinforcing the need for quality assurance (QA), traceability systems, and financing solutions (GoSL, 2023).

3.4.3 Extension, Knowledge Systems, and Data

The public extension system faces severe capacity constraints, with agent-to-farmer ratios far above recommended levels, and insufficient operational resources to support field visits, demonstrations, or farmer training. While Sierra Leone has begun rolling out digital advisory and e-extension platforms, coverage is uneven, and integration with research systems remains limited. A critical gap lies in the weak linkage between Laboratory results (e.g., soil tests, seed health, residue analysis) and advisory services. Without standardized data protocols and Laboratory Information Management Systems (LIMS), the translation of research findings into actionable advice for farmers is inconsistent. The Feed Salone strategy and development partners such as IFAD emphasize the importance of strengthening these lab-to-field knowledge flows and scaling interoperable digital platforms to enhance adoption and compliance with standards (IFAD, 2023).

3.4.4. Market Access, Price and Quality Risks

Sierra Leonean farmers and agribusinesses face significant market risks, ranging from volatile input and output prices to inconsistent quality standards. Weak aggregation systems and logistics further exacerbate these risks, limiting farmers' ability to negotiate favourable prices and participate in larger value chains.

The World Bank's 2024 Agricultural Sector Risk Assessment highlights these vulnerabilities, noting that risk-management instruments such as crop insurance, structured warehousing, and price-hedging mechanisms are either absent or underdeveloped. As a result, smallholders remain highly exposed to shocks, which discourages investment and innovation. Enhancing aggregation networks, developing financial instruments, and strengthening market information systems are therefore key priorities for de-risking agricultural production and trade (World Bank, 2024).

3.4.5. Trade Integration, Standards, and SPS/TBT Readiness

To benefit from regional (ECOWAS) and continental (AfCFTA) market integration, Sierra Leone's agricultural products must comply with Sanitary and Phytosanitary (SPS) measures and Technical Barriers to Trade (TBT) standards. However, the country's quality infrastructure remains underdeveloped, with gaps in accredited Laboratories, inspection capacity, and enforcement systems. According to the Feed Salone Year-1 Report, progress has been made in establishing testing capacity for contaminants such as aflatoxins, and in standardizing some methods, but broader system upgrades are still required. Without reliable traceability, labelling, and certification mechanisms, Sierra Leone's capacity to export competitive agricultural products remains limited. Strengthening SPS/TBT readiness is thus essential for realizing the gains from regional trade agreements (GoSL, 2024).

3.4.6. Climate and Environmental Risks

Agricultural performance is increasingly shaped by climate and environmental risks. Recurrent floods, erratic rainfall, and rising temperatures disrupt production cycles, damage infrastructure, and exacerbate rural poverty. Sierra Leone's high exposure to climate shocks contributes significantly to food insecurity, as households dependent on rain-fed farming have limited coping capacity. Environmental degradation—through deforestation, over-cultivation, and land-use pressures—further undermines the resilience of farming systems. Recent humanitarian assessments from 2023–2025 identify climate shocks as a leading

driver of emergency food assistance needs, reinforcing the urgency of scaling climate-smart agriculture, risk-monitoring systems, and natural resource management practices (WFP, 2024).

3.4.7. Nutrition and Food Security Pressures amid Import Dependence

Sierra Leone remains heavily dependent on rice imports, which exposes the country to global price volatility. Periodic surges in international rice prices—compounded by domestic production shortfalls, currency depreciation, and high transport costs—translate into unstable retail prices and reduced affordability for households. The result is recurrent food insecurity, with the poorest and most vulnerable groups disproportionately affected. Although the government's policy response under Feed Salone emphasizes import substitution through rice self-sufficiency, structural constraints on the supply side (low yields, weak irrigation, limited seed reliability) and persistent demand-side poverty mean that vulnerability remains high in the near term (AP News, 2024).

3.4.8. Public Finance, Project Delivery, and Coordination Constraints

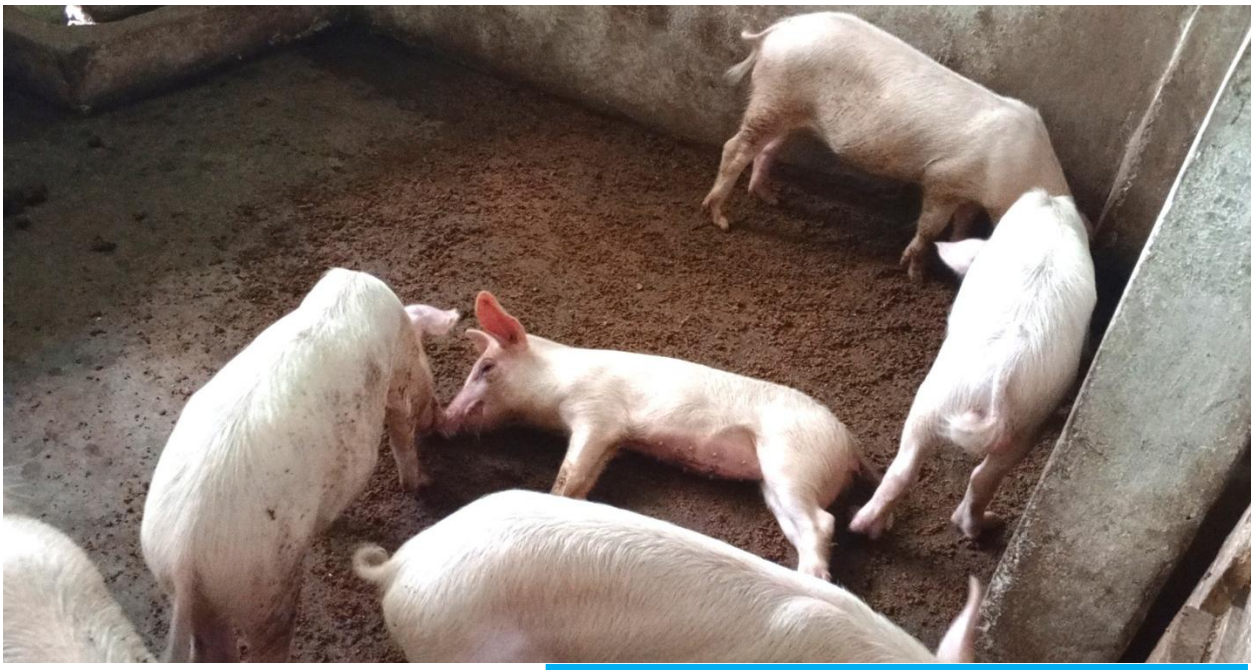
Agricultural development efforts are constrained by macroeconomic stress and limited fiscal space. Fiscal deficits, high debt-service obligations, and slow budget execution restrict the government's ability to finance agricultural operations and provide timely co-financing for donor-funded projects. Supervision reports in 2023 highlighted slippage against implementation schedules, with delays stemming from weak procurement systems, cash-flow shortages, and institutional capacity gaps. These issues are echoed in broader macroeconomic assessments, which underline the challenge of translating policy commitments into effective delivery. The consequence is under-execution of planned investments, reducing the sector's ability to scale interventions on time (IFAD, 2023).

3.4.9. Livestock Health and Veterinary Services

The livestock sub-sector faces systemic challenges that undermine diversification and resilience. Productivity is constrained by endemic animal diseases such as Peste des Petits Ruminants (PPR) in goats and sheep, and Newcastle disease in poultry. Low vaccination coverage and a shortage of trained veterinary and para-veterinary professionals exacerbate mortality rates and production losses. Weak surveillance systems and limited veterinary infrastructure reduce the sector's capacity to respond to outbreaks effectively. These constraints hinder the role of livestock in supporting household nutrition, income diversification, and resilience to crop shocks (World Bank, 2024).

3.4.10. Inclusion Constraints: Gender, Youth, and Vulnerable Groups

Women and youth, who constitute most of the agricultural labour force, continue to face structural barriers to productivity and enterprise creation. Women encounter unequal access to inputs, land tenure insecurity, and limited access to credit and labour-saving technologies, while youth face high rates of underemployment and limited entry points into profitable agricultural value chains. These constraints perpetuate poverty and migration pressures. Programmatic reviews and humanitarian assessments emphasize that without targeted measures - such as tailored finance, mechanization services, and gender-responsive extension - efforts to build resilience and inclusivity will fall short. Addressing these gaps is vital for ensuring that productivity growth is equitable and sustainable (FAO, 2023).



3.4.11. Governance and Policy Execution Risks

Although Sierra Leone has developed strong policy frameworks - such as the Medium-Term National Development Plan (2024–2030) and the Feed Salone strategy - the persistent challenge is execution capacity. Weaknesses in procurement, monitoring and evaluation, cross-ministerial coordination, and private-sector crowd-in limit the impact of otherwise well-designed strategies. In particular, the timely rollout of seed policies, certification systems, and SPS/TBT enforcement has lagged, delaying sectoral transformation. Feed Salone's Year-1 progress report emphasized the need for strengthened delivery systems, including performance scorecards, results compacts, and improved risk-financing mechanisms, to ensure that sector commitments are translated into measurable results (GoSL, 2024).

3.4.12 Implication for SLARI and Partners

The literature review shows that despite the wide range of challenges facing Sierra Leone's agricultural sector, a set of four cross-cutting constraints consistently emerge as the most critical for achieving lasting transformation. Addressing these constraints will determine whether the country's flagship programmes, particularly Feed Salone and the Medium-Term National Development Plan (MTNDP) 2024–2030 can deliver on their promises of food security, poverty reduction, and agrifood competitiveness.

First, productivity infrastructure remains a binding constraint. Agriculture continues to rely heavily on rain-fed production, with very limited irrigation capacity, especially in the inland valley swamps (IVS) that hold the greatest potential for rice intensification. Mechanization services are sparse, expensive, and often inaccessible to smallholders, limiting efficiency and raising labour costs. Storage and post-harvest infrastructure are inadequate, leading to high losses, seasonal shortages, and market volatility. Prioritized investments in irrigation, mechanization, and storage are therefore essential to unlock yield potential and stabilize food supply.

Second, seed and input reliability are central to sustained productivity gains. The pipeline from early generation seed (EGS) to certified seed remains fragile, with gaps in breeder seed production, certification systems, and last-mile distribution. Farmers frequently face shortages of quality seed and inputs, compounded by high costs and weak financing options. Strengthening quality assurance (QA) systems, introducing traceability mechanisms, and scaling private multipliers are critical steps for ensuring that improved varieties and inputs consistently reach farmers. This will also underpin broader regional trade integration, as seed quality and reliability are prerequisites for competitiveness in ECOWAS and AfCFTA markets.

Third, standards and data systems must be reinforced to improve quality and compliance. Sierra Leone's ability to access regional and international markets depends on functional Laboratories, accreditation systems, and standardized protocols. Without reliable data flows - through Laboratory Information Management Systems (LIMS) - and integration with digital extension platforms, research results cannot effectively translate into farm-level adoption. Building robust knowledge systems that connect

Laboratories, extension agents, and digital advisory tools will not only improve compliance with SPS/TBT standards but also enhance farmers' decision-making and resilience to shocks.

Finally, delivery and finance capacity determine whether strategies move from plan to impact. Budget execution delays, weak procurement systems, and limited co-financing opportunities frequently undermine the implementation of national agricultural strategies. At the same time, the sector struggles to attract private investment due to high risks, limited guarantees, and weak market institutions. Strengthening delivery systems - including performance compacts, transparent monitoring, and risk-mitigation instruments such as insurance and blended finance - will be critical for sustaining momentum. SLARI's role as an evidence provider on varietal performance, cost-effectiveness, and climate-risk management can directly support decision-making within these delivery frameworks.

Thus, prioritizing evidence-based investments in these four areas, productivity infrastructure, seed and input reliability, standards and data systems, and delivery and finance offer the highest leverage for durable sector gains. Anchoring these efforts to the Feed Salone strategy and aligning with regional trade requirements will maximize Sierra Leone's potential to achieve self-sufficiency, strengthen resilience, and position its agricultural sector within competitive, green regional value chains.

3.5 Stakeholder Analysis

Effective delivery of this Strategic Plan depends on SLARI's ability to collaborate with a wide range of stakeholders at national, regional, and international levels. These stakeholders provide opportunities for joint research, policy alignment, technology adoption, capacity building, and resource mobilization. At the same time, weak coordination, conflicting interests, or under-resourcing may constrain implementation if not addressed proactively. The Table 1 highlights the **interests, comparative advantages, and potential contributions** of SLARI's stakeholders, as well as the implications for the Institute's operationalization of its mandate.

Table 1: Stakeholder Categories and Contributions to SLARI Strategic Plan

Stakeholder Category	Potential Contributions to Implementation	Implications for SLARI
Government ministries and agencies (MAFS, Finance, Trade, Education, ICT, Local Government, Environment)	Policy guidance, extension services, budgetary support, infrastructure, regulatory standards, data systems	Must align research priorities with Feed Salone, MTNDP, and national budget cycles; embed outputs into extension and certification frameworks
Parliament	Legislation, budget approval, oversight	Continuous engagement to secure statutory support for SLARI Act 2023 and recurrent funding
Local Councils	Community mobilization, co-financing, infrastructure, market regulation	District-level demonstration networks and PPP pilots should be co-designed with councils
Universities and training institutes	Human resource development, collaborative research, mid-level extension training	Strengthen joint curricula, research fellowships, and capacity development
Professional bodies	Ethics, technical standards, best practices	Ensure compliance with professional norms and sector benchmarks
Farmer organizations and communities	Local knowledge, validation, adoption, advocacy	Integrate into participatory research and ensure gender/youth inclusion
NGOs and CBOs/FBOs	Mobilization, scaling, advocacy, inclusivity	Partnerships for outreach, safeguards, and inclusion in trials
Seed companies, agro-dealers, processors	Commercialization of seed and technologies, investment, PPP co-financing	Strengthen QA, certification, and market linkages
Financial institutions	Credit, insurance, PPP financing	Develop blended finance and adoption-linked credit schemes
ICT and media organizations	Dissemination, e-extension, awareness creation	Scale adoption tracking, digital advisory, and MEL dashboards

Regional bodies (ECOWAS, CORAF)	Policy harmonization, regional networks, technology catalogues	Accelerate varietal release, seed policy alignment, foresight
Continental bodies (FARA, AU/CAADP)	Research frameworks, advocacy, coordination	Align to Post-Malabo pillars and continental RandI commitments
AfCFTA/SPS/TBT authorities	Trade rules, quality standards, compliance frameworks	Position SLARI labs and SOPs for accreditation, traceability, and market readiness
International research and ARIs	Technical backstopping, joint research, global knowledge transfer	Secure collaboration on stress-tolerant varieties, lab standards, foresight
Development partners (AfDB, IFAD, FAO, WFP, MCC, bilateral donors)	Finance, capacity building, infrastructure support	Leverage for PPPs, lab upgrades, irrigation, and innovation platforms

3.6 Performance Review (2015–2024) and Lessons Learned

Over the 2015–2024 period, SLARI's Strategic and Operational Plans provided a shared vision for research and innovation, and the institute made tangible contributions despite headwinds. A mixed-methods review—combining desk analysis of plan documents and centre reports with interviews and focus groups across all research centres, ministries, farmer organisations, private firms and development partners shows a system that is scientifically capable, nationally relevant, yet hampered by structural and operational bottlenecks that constrained scale and sustained adoption.

3.65.1 Key Achievements

SLARI registered credible achievements in technology development and varietal release, particularly in rice and cassava, with additional work in sweet potato, groundnut, yam and complementary agronomy. Genetic resource conservation and characterisation advanced, including work that positioned Sierra Leone within international conversations on under-utilised species. Limited but promising steps were taken towards commercial orientation such as the creation of a Technology and Innovation Park and the establishment of a Commercialization directorate, signalling appetite to move research closer to enterprise and market needs. In parallel, the institute began clarifying its comparative advantage within the seed system: leading early-generation seed (EGS) production (breeder/foundation) and working through licensed multipliers for certified seed. Where resources allowed, centres supported adaptive trials and took initial measures to package technologies for users and partners.

3.6.2 Challenges

Delivery fell short of the full intent of the plans due to a set of mutually reinforcing constraints. Financial flows were delayed and unpredictable, causing missed seasonal windows, procurement slippage and

deferred operations and maintenance. Human resources eroded through attrition and ageing profiles, with thin pipelines in critical disciplines (breeding, soils, animal health, post-harvest and digital agriculture) and sporadic, unstructured professional development that weakened continuity. Infrastructure and digital

deficits including non-functional Laboratories, outdated equipment, unreliable power/connectivity and the absence of a Laboratory information management system (LIMS) undermined quality assurance, data curation and credibility for partnerships. Research–extension–market linkages were largely ad hoc:

innovation platforms remained sporadic, feedback loops from farm and firm to research were weak, and knowledge products were not consistently translated or tailored for local uptake. Highly centralised approvals slowed procurement, partnership formation and fieldwork, with centre autonomy limited and performance compacts/scorecards not systematically used. External shocks (Ebola, COVID-19, climate events) amplified these internal weaknesses, further disrupting field programmes and cash-flows. An internal implementation audit indicated that less than half of prior plan recommendations or targets were fully accomplished, reinforcing the need for sharper execution mechanisms.

3.6.3 Lessons Learned for the Next Cycle

These lessons below directly shape the architecture of the revised plan:

- Strategic alignment must be dynamic. National priorities (e.g., Feed Salone) and partner windows evolve more quickly than static plan cycles; therefore, annual portfolio reviews and the 2029 mid-term review should recalibrate centre workplans and budgets.
- Strong research outputs require equally strong dissemination and adoption mechanisms: co-creation through centre-level innovation platforms, farmer-managed demonstrations, local-language extension products, and routine adoption studies must be budgeted and scheduled, not left to opportunistic funding.

- Retention, a career-long CPD ladder, mentorship and targeted recruitment in undersupplied disciplines are necessary to protect institutional memory and raise throughput.
- Communication is a core function: proactive visibility including seasonal EGS plans, centre scorecards, lab QA status, plain-language policy and practice briefs, builds credibility, attracts partners and informs decision-makers.
- A fit-for-purpose policy suite - standard pricing, IP/licensing templates and conflict-of-interest guardrails, coupled with a reinvestment rule that returns a share of net revenues to centres and shared services - will allow responsible own-source income growth without compromising public-good science.
- Participation thresholds (e.g., women and youth in innovation platforms and community trials), disaggregated indicators and targeted youth/women adoption pathways must be designed into programmes from the outset. Seventh, delegate to deliver: a Delegated Authority Framework should set clear centre-level thresholds for procurement, partnerships and OPEX, balanced by ex-post assurance, annual performance compacts and transparent scorecards.
- Establish a small grants/commercial office to professionalise proposal development and partner management; create a revolving bridge fund to smooth cash-flow gaps around seasonal operations; and track a funding-mix scorecard (core, grants, commercial) with centre-level targets.
- Prioritise Laboratory rehabilitation, SOP/QA manuals, LIMS and connectivity, with preventive maintenance that protects investments.
- Institutionalise monitoring, evaluation and learning (MEL): indicator reference sheets, a digital dashboard, quarterly learning reviews and regular adoption/outcome studies should tie evidence to resource decisions.
- Formalise partnerships. Convert informal ties with universities, firms and NGOs into MoUs/compacts with co-funded workplans and data-sharing and open a private R&D co-validation window under standard protocols and NDAs.

Chapter 4 - Strategy Frameworks

4.1 Theory of Change (ToC)

The Sierra Leone Agricultural Research Institute (SLARI) will serve as a catalyst for transforming the country's agri-food system by delivering research that is demand-led, climate-smart, and market-responsive. The strategy assumes that if SLARI systematically designs and delivers research and extension packages in collaboration with farmers, SMEs, and local governments, the outputs will be directly relevant to user needs and production realities. These packages will integrate improved crop varieties, agronomic practices, input and finance access, and post-harvest/processing solutions. At the same time, SLARI will ensure a reliable supply of early-generation seed (EGS) and strengthen the pull-through of EGS into certified seed systems. This is critical because reliable and predictable seed systems form the backbone of productivity improvements and resilience.

The Institute will also invest in its own institutional capability by equipping research centres with delegated decision-making authority, functional Laboratories, ICT-enabled data systems, and clear service-level

agreements. These measures will reduce bottlenecks, increase service quality and speed, and enhance credibility with stakeholders. Finally, by building market-linked partnerships—with seed firms, agro-dealers, processors, financial service providers, and regional institutions - SLARI will foster private co-investment and create sustainable pathways for scale. Collectively, these actions will contribute to higher productivity and incomes for smallholders, improved dietary diversity and nutrition, stronger climate resilience, safeguarded soils and water systems, and the creation of dignified jobs for youth within the seed–input–processing–services ecosystem.

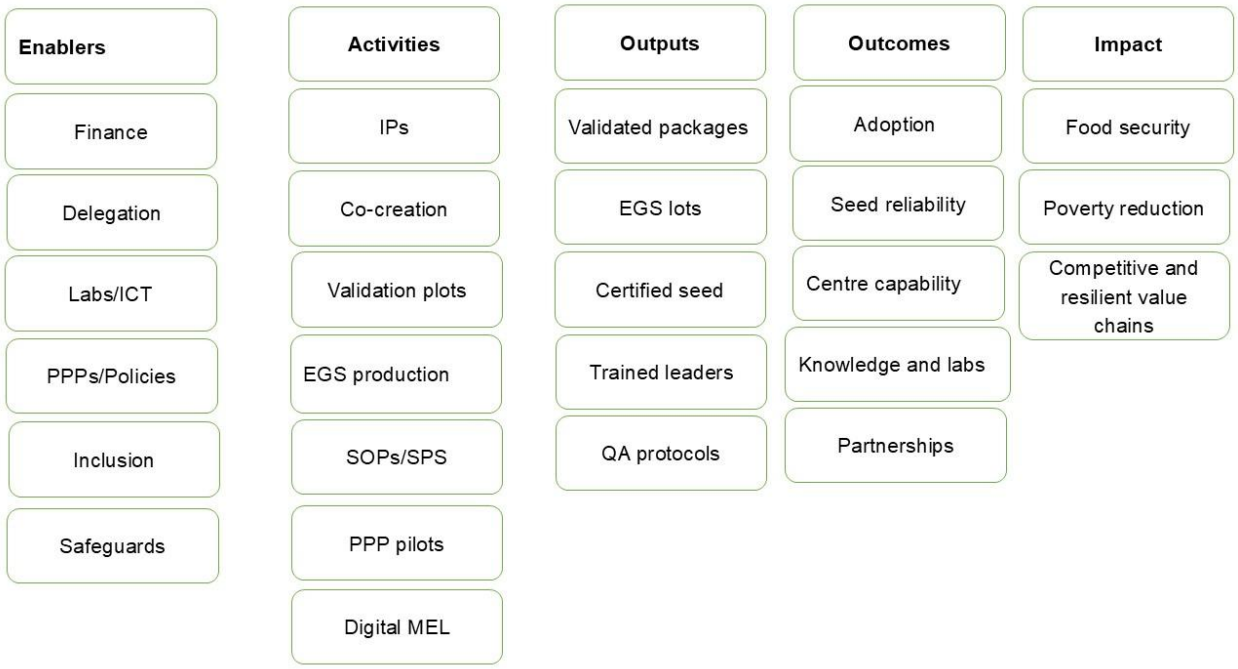


Figure 1. Components of the SLARI's Theory of change

4.1.1 Causal Pathways

- ***Demand-led R&D and co-creation***
  Through Innovation Platforms, seasonal Co-creation Clinics, and farmer-managed validation plots, SLARI will institutionalize participatory research and extension design. By ensuring that priorities originate from users and are tested in real farm conditions, the solutions generated will be practical, affordable, and responsive to farmer realities such as risk tolerance, labour constraints, and cash flow limitations. This approach is expected to lower adoption barriers, shorten the lab-to-field cycle, and build farmer trust in new technologies.

- **Seed system reliability**
  The establishment of functional breeder and foundation seed pipelines, organized by crop and agro-ecology, will reduce downstream bottlenecks in certified seed production. By ensuring that commercial seed growers and associated out-growers access reliable foundation seeds, SLARI will ensure that varietal turnover improves, stress-tolerant genetics reach farmers and certified seed

volumes increase. This pathway is expected to stabilize yields, reduce vulnerability to droughts, floods, and pests, and enhance farmer bankability with financial institutions.

- **Centre capability**
  With delegated authority for procurement, contracting, and release decisions, coupled with functional Laboratories for seed health, soil/fertilizer analysis, residue, and food safety, SLARI centres will deliver

- faster, higher-quality, and more credible services. ICT systems, including Laboratory Information Management Systems (LIMS) and mobile-based MEL tools, will enhance transparency, traceability, and efficiency. Improved service quality will strengthen SLARI's reputation, attract additional co-financing through PPP pilots and grants, and enable compliance with Sanitary and Phytosanitary (SPS) and Technical Barriers to Trade (TBT) requirements for market access.

- **Knowledge and labs**
  By rehabilitating Laboratories, standardizing diagnostic methods, and linking data systems with digital advisory services, SLARI will create a knowledge infrastructure that connects research outputs directly to farmers and SMEs. Digital advisories and open knowledge repositories will provide real-time recommendations on inputs, practices, and risk management. Accredited labs will also ensure compliance with SPS/TBT standards, unlocking regional and international markets and strengthening Sierra Leone's competitiveness.

- **Finance and partnerships**
  Structured partnerships with private firms, development partners, and regional institutions will anchor SLARI's transition to a co-financed and market-oriented model. Public–private partnerships will align incentives across the value chain - through mechanisms such as buy-back arrangements, quality premiums, and shared infrastructure - making agricultural investments more attractive and predictable. Regional collaboration with CORAF, ECOWAS, and AfCFTA institutions will allow SLARI to benefit from shared resources, harmonized seed laws, and technology transfer, accelerating scale and sustainability beyond project cycles

Assumptions and Risks

- ***Stable financing base:*** It is assumed that SLARI will continue to receive predictable core funding to maintain staff, Laboratories, and field operations. If financing becomes volatile, service delivery could be disrupted.

- ***Functional quality systems:*** Certification and regulatory systems (seed services, plant health, standards bodies) must remain functional and credible. Weak enforcement could undermine seed and input reliability.

- ***Supportive policy environment:*** Continued government and institutional support for PPPs, data-sharing, and decentralization will be critical. Policy reversals or delays in regulatory reforms could slow implementation.

- ***Manageable climate shocks:*** The strategy assumes that climate shocks - floods, droughts, heatwaves - will remain within the ranges modelled for adaptation planning. More severe or frequent shocks could overwhelm resilience measures.
- ***Sustained co-financing:*** The ToC depends on ongoing co-investment from seed firms, processors, MFIs, and donors. If private or donor financing declines, the scaling pathway may be constrained.

4.2. Outcome Logic Model (OLM)

The Outcome Logic Model (OLM) provides the operational translation of SLARI's Theory of Change (ToC), ensuring that long-term aspirations are broken down into measurable results with clear timelines. It

functions as both a planning and accountability framework, linking activities and outputs (short-term, within OP-I and OP-II) to strategic outcomes (medium-term by 2030/2035) and ultimately to impact (long-term by 2035). The OLM will guide annual work planning, budgeting, monitoring, and evaluation, ensuring that results are evidence-based and traceable from field-level interventions to system-wide change.

4.2.1 Impact (2035)

By 2035, Sierra Leone's agri-food system will be structurally stronger, resilient, and more competitive. Smallholder farmers will achieve sustained gains in productivity and incomes, supported by reliable input and output markets. Dietary diversity and nutrition outcomes will improve, particularly for vulnerable households, due to the wider adoption of improved varieties and value-added processing. Soil health, water systems, and biodiversity will be better protected through climate-smart practices and safeguards, enhancing ecosystem services. Youth employment will expand through opportunities in seed production, mechanization, agro-processing, and service provision. Finally, Sierra Leone's value chains will be positioned to compete in regional and international markets, meeting Sanitary and Phytosanitary (SPS) and Technical Barriers to Trade (TBT) standards.

4.2.2 Strategic Outcomes (by 2031 / 2035)

- **Adoption and Scale**
  By 2029, at least **25% of farmers and SMEs in pilot areas** will consistently adopt SLARI-validated technology packages, integrating improved varieties, agronomy, inputs/finance, and post-harvest solutions. Adoption will be measured not only in terms of rate but also **intensity** (share of land/production under improved practices) and **persistence** (use over multiple seasons). By 2035, adoption will reach **critical mass in targeted geographies and value chains**, embedding technologies into farming systems, with market linkages sustaining scale. Women and youth will be equitably represented through tailored extension, inclusive financing, and participation in innovation platforms.

- **Seed System Reliability**
  By 2029, SLARI will deliver predictable annual minimum quantities of Early Generation Seed (EGS) including 6–8 MT of breeder rice seed and 90–120 MT of foundation rice seed; 4.0–5.0 million cassava foundation cuttings; 1.2–1.5 million sweet potato foundation vines; 1.0–1.5 MT of breeder legumes and 20–30 MT of foundation legumes; 120–180 kg of horticultural foundation seed; and 8–12 MT of pasture and fodder foundation seed. These EGS volumes will feed certified supply chains managed by licensed multipliers, enabling certified seed availability for 40–50 percent of national demand by the end of OP-I. By 2035, varietal turnover will be aligned with **climate stress profiles (drought, floods, pests, salinity)** and **market quality standards (grain quality, nutrition, processing traits)**. Certified seed availability will cover the majority of demand, stabilizing yields, reducing risk, and enhancing resilience.

- **Centre Capability**
  By 2029, SLARI centres will consistently meet **service-level agreements (SLAs)**, supported by delegated decision-making, standardized SOPs, and robust QA mechanisms. Each centre will publish **performance scorecards** to build transparency and stakeholder trust. By 2035, the centres will be recognized as **co-financed innovation hubs**, jointly supported by government, private sector, and partners. They will convene multi-stakeholder platforms, broker partnerships, and act as credible delivery institutions within the national and regional research ecosystem.

- **Knowledge and Laboratories**
  By 2029, SLARI will rehabilitate and validate its **core Laboratories** (seed health, soil/fertilizer, residues/food safety) and operationalize a **Laboratory Information Management System (LIMS)** for traceability. Standardized protocols will improve credibility and data flows into extension. By 2035, selected labs will achieve **international accreditation**, enhancing Sierra Leone's compliance with SPS/TBT requirements for cross-border trade. Digital advisories, linked to lab-generated data, will scale evidence-based recommendations to farmers and SMEs, reaching hundreds of thousands with real-time, actionable guidance.

- **Finance and Partnerships**
  By 2029, SLARI will establish a **partnership and grant-capture window** to systematically mobilize external resources, alongside piloting structured PPPs across priority value chains. By 2035, SLARI's financing base will be **significantly diversified**, combining core public funds with bilateral and

multilateral grants, private co-investment, and cost-sharing arrangements. Regional alliances (e.g., with CORAF, ECOWAS, AfCFTA) will be formalized, and an increasing share of SLARI's portfolio will be **co-financed**, reducing dependency and improving sustainability.

4.2.3 Phasing the ToC across Operational Plans

Outputs (OP-I: Foundations, Years 1–5)

During the first operational phase, emphasis will be placed on building the foundations for scale:

- Priority varietal pipelines for key crops completed, and EGS acreage expanded.
- 3–5 PPP pilots per value chain launched to test co-investment models.
- Core labs rehabilitated and LIMS made functional, ensuring data credibility.
- District demonstration networks deployed to anchor adoption locally.
- Baseline adoption and outcome surveys conducted to establish benchmarks.

Outputs (OP-II: Markets and Quality, Years 6–10)

In the second operational phase, focus will shift to markets and quality:

- Certified seeds scaled to meet at least 60% of national demand.
- Full SPS/TBT compliance achieved, including traceability, labelling, and proficiency testing.
- Digital advisory services scaled nationwide, reaching over 250,000 farmers.
- PPPs consolidated under performance-based compacts with clear accountability.
- An independent outcome and impact evaluation conducted to assess progress and feed into the next planning cycle.

4.3 Participatory Framework

The revised Strategic Plan recognizes that agricultural transformation cannot be achieved by SLARI acting in isolation. The Institute's legitimacy and effectiveness depend on deep, structured participation from farmers, SMEs, local governments, seed companies, regulators, financiers, development partners, and regional bodies. Participation is not a symbolic add-on, but a standing operating principle embedded in every stage of the research-to-adoption cycle: from agenda setting, to field validation, to monitoring, and after-action learning.

The participatory framework is built around three guiding objectives:

- **Ground research and delivery in real-world needs.** SLARI's research will be shaped by the lived realities of farmers, SMEs, and local councils, prioritizing outcomes such as yield stability, quality assurance, risk reduction, and market access over paper-based outputs.

- **Build shared ownership and accountability.** Stakeholders are co-investors in agricultural transformation. Their roles, responsibilities, and contributions - whether land, seed, data, or finance - must be transparently defined through compacts and partnerships.
- **Institutionalize continuous feedback.** A rolling seasonal cycle of consultation, validation, dissemination, and reflection ensures that evidence and experience refine priorities and protocols, making SLARI's outputs adaptive and demand driven.

4.3.1 Mechanisms for Participation

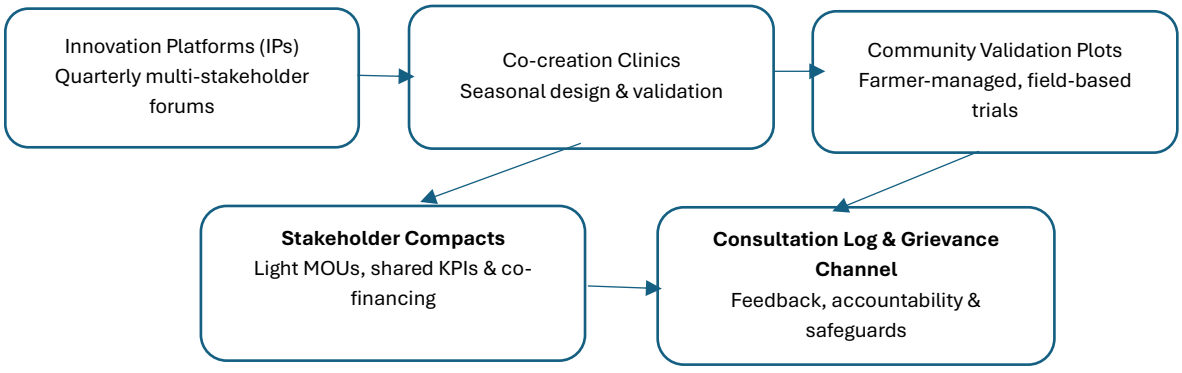
Decision points will be deliberately located as close as possible to users - districts, wards, producer organizations, processors, and local authorities. This will ensure that innovations are not only scientifically sound but also socially acceptable and economically viable. Shared ownership will be cultivated through transparent role definition, "light but binding" compacts, and joint monitoring of key performance indicators (KPIs). Feedback loops will be institutionalized through seasonal cycles of co-creation, reflection, and adjustment, supported by a public consultation log and grievance channel.

This participatory framework ensures that SLARI's research agenda remains grounded, adaptive, and inclusive. By embedding user voices in research design, co-financing in delivery, and evidence in policy, SLARI not only improves adoption rates but also builds durable accountability. Over time, these mechanisms will create a culture of joint ownership, where farmers, SMEs, local councils, private actors, and regional partners view SLARI as a trusted convener, evidence provider, and co-investor in Sierra Leone's agrifood transformation.

The Participatory Framework ensures that SLARI's strategy is not only research-driven but also farmer- and partner-cantered, with continuous feedback and accountability mechanisms. It has five interconnected mechanisms as presented in Figure 2.

Participatory Framework Flow

Figure 2. Participatory Framework of SLARI's strategy



Mechanisms 1: Innovation Platforms (IPs)

Innovation Platforms will be convened quarterly at each SLARI Centre and will bring together a wide

spectrum of stakeholders - farmers, including women and youth leaders, processors, traders, input dealers, extension services, local government officials, NGOs, financiers, academia, and regulators. These platforms will function as the primary hubs for problem identification and opportunity mapping along value chains and agro-ecologies. Their role will be to ensure that the research agenda is demand-driven and reflects the lived challenges of farming communities and market actors. The IPs will also serve as partnership brokering spaces, where resources will be mobilized and commitments clarified. Each meeting will conclude with an agreed "action log" that assigns responsibilities and deadlines, thereby transforming discussions into accountable deliverables.

Mechanisms 2: Co-Creation Clinics

Building on the priorities identified in the IPs, Co-Creation Clinics will be organized as seasonal working sessions to translate broad needs into practical, testable protocols. The Clinics will follow a structured

workflow: prioritisation of key issues, drafting of solution concepts, development of protocols, validation planning, and packaging for dissemination. At the end of each Clinic, a "decision gate" will ensure that proposals are not only technically sound but also inclusive, affordable, environmentally responsible, and socially acceptable. This mechanism will embed accountability early in the research cycle and ensure that resources are invested in solutions with the highest adoption potential.

Mechanisms 3: Community Validation Plots

Community Validation Plots will be farmer-managed demonstration sites where solutions will be tested under real-world conditions. They will allow farmers and SMEs to observe and compare innovations side by side, assess yield gains, input efficiency, quality, and labour demands, and decide on feasibility. Field days will be organized at these sites in local languages, allowing diverse participants - including women, youth, and vulnerable groups - to engage directly with the technologies. Feedback will be systematically collected through simple scorecards and mobile reporting tools, ensuring that evidence will be fed back

into the IPs and Co-Creation Clinics. This mechanism will build trust, ensure that technologies are not imposed from above, and provide clear evidence of benefits and trade-offs.

Mechanisms 4: Stakeholder Compacts (light MOUs)

Stakeholder Compacts will be concise agreements that will define roles, responsibilities, and benefit-sharing arrangements between SLARI, farmer groups, SMEs, and public agencies. These compacts will specify contributions of land, labour, seed, inputs, extension time, and financing, while also addressing issues of data sharing, reporting frequency, and intellectual property rights. By formalizing these expectations in a light but binding manner, the compacts will reduce ambiguity, promote transparency, and encourage co-investment. They will create accountability among all actors while fostering trust and collaboration.

Mechanisms 5: Consultation Log and Grievance Channel

The Consultation Log will provide a transparent record of all structured engagements, including the issues raised, decisions made, and follow-up actions taken. Alongside this, the Grievance Channel will offer farmers and stakeholders an avenue to report concerns or complaints through multiple entry points - such as phone, SMS/WhatsApp, web forms, or suggestion boxes at research centres. A Participation and Safeguards Officer will be responsible for triaging and addressing these cases within agreed service standards, typically between 14 and 30 days. Sensitive cases, such as those involving gender-based violence, corruption, or safeguarding issues, will follow strict confidentiality protocols and referral pathways. This dual mechanism will ensure that participation is not only inclusive but also backed by accountability and recourse mechanisms.

Mechanisms 6: Inclusion and Safeguards

The Participatory Framework will be underpinned by strong inclusion standards. All Innovation Platforms, Clinics, and Validation Plots will include at least 40 percent women and 30 percent youth as a non-negotiable minimum. Inclusion will be further enabled by accessible venues, appropriate scheduling, transport or meal stipends, childcare services, and the translation of materials into local languages, including sign language where necessary. Facilitators will be trained to manage power dynamics, ensure

balanced participation, and create safe spaces for women, youth, and marginalized groups to contribute substantively. Safeguards such as informed consent, data privacy, and ethical protocols will be embedded across all activities, ensuring that engagement will be meaningful, equitable, and respectful of participant rights.

4.4 Crosscutting: Gender, Youth, Inclusion and Safeguards

SLARI will ensure that science and services are equitable, safe, and accessible so that women, youth, persons with disabilities (PWDs), and low-income participants benefit meaningfully and help steer decisions. Inclusion will be treated as both a design criterion and a measurable outcome: centres will plan and budget for participation and access from the outset, monitor who benefits and who does not, and adjust delivery based on evidence. The approach will combine minimum participation thresholds, universal design and accessibility measures, targeted pathways for women and youth into leadership and jobs, and robust safeguarding and grievance mechanisms. Progress will be tracked through the MEL system using indicator reference sheets with sex-, age- and, where feasible, disability-disaggregated data.

4.4.1 Centre Gender Action Plans (GAPs)

Each centre will prepare and budget an annual Gender Action Plan (GAP) that integrates directly into its Performance Compact and seasonal workplans. The GAP will set research and delivery priorities that close identified gender gaps - such as labour-saving tools, varietal traits preferred by women, nutrition-sensitive crops, safer processing workflows, and market access constraints faced by women-led enterprises. Participation and leadership will be explicit: centres will target at least 40% women in Innovation Platforms, Co-creation Clinics, field leadership teams, and lead-farmer roles, and will institute women co-chairs for at least one Innovation Platform thematic area per centre. Workplace equity measures will include gender-balanced recruitment shortlists, fair and transparent promotion criteria, lactation and parent-friendly provisions, flexible scheduling during peak caregiving periods, and mandatory anti-harassment training linked to a clear disciplinary pathway. Budgets will earmark funds for facilitation, translation, accessibility, childcare, participant stipends, and safe transport. GAP metrics will include women's adoption rate and adoption intensity; the share of women in lead-farmer, nursery, and SME roles; and the proportion of centre staff who are women by grade, with year-on-year targets and corrective actions where results lag.

4.4.2 Youth Pathways (internships, apprenticeships, first jobs)

SLARI will create structured pathways for youth - especially young women and PWDs - into scientific, technical, and enterprise roles. Internships of six to twelve months will rotate participants through Laboratories, field operations, data/MEL, and extension, with defined learning outcomes, assigned mentors, and micro-credentials that map to SLARI's capability framework. Centres will target at least 30% youth participation across all participatory mechanisms and will reserve at least 20% of annual internships for PWDs or candidates from disadvantaged backgrounds, providing reasonable accommodation and assistive technologies as needed. Apprenticeships will place youth with nurseries, licensed seed multipliers, mechanisation providers, feed mills, pack-houses, and cold-chain MSMEs, with stipends and personal protective equipment built into agreements. A two-year early-career scientist programme will provide a clear route from graduate entry to confirmation, with fast-track options in scarce disciplines (seed science, instrumentation, data engineering). Core metrics will include numbers trained and placed, the percentage retained in agri-jobs after twelve months, and the number of youth-led enterprises supported or incubated.

4.4.3 Inclusive Participation Standards

All centres will apply minimum participation thresholds of at least 40% women and at least 30% youth for Innovation Platforms, Clinics, field days, and trials, tracking attendance by sex, age, and—where feasible—PWD status. Activities will adopt universal design principles: step-free access, accessible latrines, shaded seating, and provision of sign-language interpretation or reader support where required. Materials will be produced in local languages and in plain-language formats, with audio or visual alternatives for low-literacy users. To reduce affordability barriers, centres will budget for transport and meal stipends and, where feasible, childcare support; scheduling will avoid peak market hours and caregiving times. Facilitation standards will prevent elite domination, using rotating speaking order, small-group break-outs for women and youth where helpful, and documented action points with named owners and deadlines. Compliance with these standards will be reviewed quarterly as part of the centre scorecard and addressed through coaching or re-design where gaps persist.

4.4.4 Safeguards: Do-no-Harm, Grievance, and Referrals

Safeguards will be embedded across research and delivery. All staff and contractors will be trained annually on the code of conduct, Protection from Sexual Exploitation and Abuse (PSEA) and gender-based violence (GBV) policies, child and vulnerable-adult safeguarding, conflict sensitivity, first-aid, and field safety. A multi-channel grievance redress mechanism - phone, SMS/WhatsApp, web form, and secure suggestion boxes at centres - will acknowledge cases within seventy-two hours and aim to resolve them within fourteen to thirty days, with survivor-centred handling for GBV/SEA cases and strict confidentiality. District-

level referral pathways to medical, psychosocial, and legal services will be mapped and kept current. Field and Laboratory safety will follow documented risk assessments, PPE requirements, safe chemical and biological handling, incident logs, and corrective actions, with site-specific emergency contacts and evacuation procedures. Safeguards metrics will include the number of grievances received and the share resolved on time, the number of safeguarding incidents and resolution timeliness, the share of staff trained and certified, and safety audit pass rates, all reported through the MEL dashboard.

4.4.5 Data Protection and Ethics

All person-level and sensitive data will be protected by design. Informed-consent scripts and forms will be used for surveys, validation plots, images, and audio; participants will be able to opt out without penalty. Datasets will be de-identified before analysis or publication, and access to identifiable data in LIMS, MEL, and ERP will be governed by role-based permissions with full audit trails. Retention and deletion schedules will be specified in the Data Policy and enforced by system administrators, with secure backups and a documented incident-response playbook. Ethics approvals will be mandatory for human-subjects work and for sensitive geospatial data where reasonable re-identification risk exists; approvals and consent forms will be archived in protocol packs. MEL Quality Assurance will include privacy checks during quarterly DQAs, and publication of datasets will require compliant metadata, licensing, and disclosure review. Metrics will include numbers of datasets published with compliant metadata and licensing, counts of approved ethics protocols, and DQA privacy-conformance scores.

Chapter 5 - Governance and Implementation Arrangements

5.1 Research and Innovation Strategy

5.1.1 Portfolio Architecture

SLARI will maintain a balanced, problem-driven pipeline across five domains: breeding and adaptation, agronomy and natural resources management, post-harvest and processing, market and enterprise, and digital advisory. Breeding and adaptation will prioritise stress-tolerant, farmer-preferred varieties for priority agro-ecologies, with managed varietal turnover and rapid cycling from pre-breeding to release. Agronomy and NRM will package water-smart, nutrient-efficient and IPM practices into climate-smart, whole-farm recommendations validated under farmer management and costed for affordability. Post-harvest and processing will translate field gains into consistent quality and shelf-life through cleaner processing, food safety routines, loss reduction, and buyer-tested product specifications. Market and enterprise research will determine cost–return break-evens, viable service models such as mechanisation and storage, and incentive structures that pull adoption through value chains. Digital advisory will codify validated packages into simple, multilingual messages for radio, SMS, IVR and app channels, timed to season and location.

Portfolio governance will run through seasonal Co-creation Clinics that move candidate ideas through a clear sequence of prioritisation, protocol design, field validation and dissemination. Each project will pass stage-gates using criteria on relevance, inclusion, safeguards, feasibility, budget realism and adoption potential, with early termination of low-yield activities. Centres will operate under performance compacts that protect focus, define decision rights, and tie budgets to delivery and data quality. A light technology readiness scale and a data dictionary will standardise how teams describe maturity, evidence, and indicators.

5.1.2 Seed System Role

SLARI will lead Early Generation Seed (EGS) for breeder and foundation classes, while licensed multipliers will produce certified seed under the national certification authority. Each centre will publish a seasonal EGS plan by crop and variety, covering hectares, classes, target tonnage and timelines aligned to projected certified seed demand in target districts. Quality assurance will follow field and seed standards, with full traceability through lot identifiers, geo-tagged fields and test records captured in the LIMS. Public dashboards will report plans, delivered volumes, pass rates and lot release timelines to build market confidence. Framework contracts with multipliers will define service levels for inspection windows, germination and purity thresholds, complaint handling and performance-based renewal. Risk controls will include contingency EGS blocks, rogueing and isolation distances, emergency seed-health testing and basic phytosanitary measures. Success will be measured by EGS tonnes versus plan, inspection pass rates, turnaround time to lot release, and certified seed availability in target zones.

5.1.3 Genetic Resources

The gene bank will be managed as a strategic asset with a rolling regeneration plan that respects viability thresholds, regeneration intervals and site rotation to minimise genetic drift. Passport and characterisation data will be standardised and digitised, with persistent identifiers to enable citation and tracking. Safety

duplication will be arranged with national and regional partners, and periodic audits will confirm identity and viability. Systematic phenotyping and farmer-preferred trait characterisation will feed breeding priorities and seed roadmaps, while simple descriptors and images will support extension and SME product development. Access to materials will follow transparent terms, data-sharing norms and ethics and safeguards protocols; materials that require special handling or that are proprietary will be governed through appropriate agreements consistent with national policy and international obligations.

5.1.4 Precision and Digital

SLARI will adopt practical precision tools that reduce uncertainty for farmers and SMEs. Remote and proximal sensing, including rainfall and soil-moisture indices and handheld meters, will support site-specific recommendations and shock monitoring. UAV use will follow standard protocols for flight

planning, consent, data storage and safety, producing orthomosaics and crop-stand assessments where this information justifies the cost. On-farm internet-of-things packages such as simple rainfall, soil-moisture and temperature loggers will be piloted with lead farmers and service providers, and the resulting data will drive decision support for planting windows, fertiliser splits and pest alerts that feed directly into advisory content. All lab and field data will flow into interoperable standards and repositories, with LIMS for Laboratories, a data lake for trials and adoption studies, and role-based access and privacy controls. Digital products will be user-tested for clarity, language and bandwidth constraints, and they will be released with embedded feedback loops to continuously improve relevance.

5.1.5 Innovation Systems

Centres will operate Innovation Platforms that convene farmers, processors, input dealers, extension agents, local government, NGOs, financiers, academia and regulators to agree a short list of high-value problems each season. Farmer Field Schools and community validation plots will turn protocols into practice under typical conditions, using simple scorecards to capture user preferences, ease of use, cost–benefit signals and adoption intent. The digital advisory function will translate validated practices into ready-to-use content and dissemination calendars for radio, SMS, IVR and app channels. To crowd in solutions, SLARI will open a voluntary disclosure and co-validation window for private R&D. Firms will be able to submit technologies for transparent, time-bound testing against agreed protocols. Data use, branding and claims will be governed by light memoranda of understanding that protect farmers, avoid hype, ensure public access to core results and respect legitimate intellectual property.

5.1.6 Agro-industry Streams

Priority translation pathways will focus on cassava products such as HQCF, starch and gari, edible oils, poultry feed premixes, and packaging, standards and HACCP. Cassava research will optimise varieties for dry matter, cyanide reduction and processing yield; define moisture and granule specifications; and provide small-scale equipment operating procedures and energy- and water-efficient workflows. Edible oil work will target traits and processing conditions that raise oil yield and control free fatty acids and peroxides, with by-product use cases for feed and soap to strengthen enterprise economics. Poultry feed premix research will match local raw-material profiles, including maize or sorghum, cassava chips or peels, legumes and oilseed cakes, to balanced formulations, checking digestibility and toxin risks and delivering

practical advisory for small mills. Packaging and standards work will generate HACCP templates, sanitation SOPs and lot-coding and traceability models suitable for SMEs. During OP-II the programme will emphasise AfCFTA conformity, including a sequenced plan for SPS and TBT readiness, method validation, supplier approval programmes, labelling requirements and partnerships with conformity assessment bodies so that products meet regional rules and the expectations of buyers' audits.

5.1.7 Capability, Governance and Budgeting

Each centre will designate accountable leads for Breeding and EGS, Agronomy and NRM, Post-harvest and Quality, Markets and SME development, and Digital and MEL, with clear terms of reference, back-up deputies and succession plans. Annual workplans will be costed by domain, with ring-fenced lines for participation through Innovation Platforms and Clinics, inclusion measures, quality assurance and data and ICT. Internal peer review will check protocol quality before fielding; quarterly delivery scorecards will verify timeliness, budget execution, data integrity and partner satisfaction. Strategic partnerships with universities, CGIAR and advanced research institutes will provide mentorship, method validation, external proficiency testing and staff professional development where portfolio gaps are identified. Procurement thresholds and decision rights will be delegated in line with performance compacts, and risk registers will be maintained and reviewed at mid-season and end-season meetings so that mitigation actions are triggered promptly.

5.2 Governance and Organisation

Governance will be designed to sit close to delivery while remaining tight on assurance. Centres will have the room to act quickly, manage partnerships, and solve problems with local counterparts; headquarters (HQ) will safeguard strategy, risk, finance, and science quality. The model will rely on explicit delegation and decision rights, local advisory oversight, transparent performance compacts, fit-for-purpose people systems, and open knowledge practices. Together these elements will make decisions faster and cleaner, improve accountability, and make verification straightforward through digital audit trails.

5.2.1 Delegated Authority Framework (DAF)

A Delegated Authority Framework will define who can decide what, at which thresholds, and under what controls. Centres will receive tiered decision limits for procurement, partnerships, and operating expenditure (OPEX), calibrated by value and risk. Within these limits, Centre Managers will make requests for quotation, mini-competitions, or draw down pre-tendered framework agreements; above the limits, HQ will co-sign or run the process. Sole-source procurement will be permitted only for exceptional, documented circumstances - such as unique suppliers or emergencies - and will require prior HQ clearance and written justification. Vendor due diligence, conflict-of-interest declarations, and price-reasonableness checks will be mandatory at all tiers. Partnership instruments will also be delegated: standard MoUs and

Compacts using pre-approved templates (roles, KPIs, data and IP handling, inclusion and safeguarding clauses) will be signable at centre level up to a value or term cap, with atypical or higher-risk agreements escalated to the HQ legal and partnership's function. OPEX will run on monthly caps with cash-minimising rules, mandatory e-payments where infrastructure allows, two-signatory controls, and monthly bank and ERP reconciliations. Assurance will follow a "three lines" model: centre management will operate first-line controls; HQ finance, procurement, risk, and science QA will provide oversight; and internal audit will sample independently. ERP, LIMS, and MEL systems will provide a full digital audit trail of approvals, vendors, delivery notes, test results, and performance, while red-flag analytics (for example, repeated awards to the same vendor, split purchases, overdue deliverables, abnormal unit prices) will trigger targeted reviews and remediation plans.

5.2.2 Centre Advisory Committees

Each centre will be supported by a local advisory committee to keep research and service portfolios relevant, accountable, and market aware. These committees will balance membership across the private sector, farmer and processor organisations, local government, academia, and civil society, with standing requirements for women's and youth representation. The mandate will be to review seasonal priorities emerging from Innovation Platforms and Co-creation Clinics; check adoption and inclusion evidence; advise on PPPs and market alignment; and monitor risks and safeguards. The committees will operate with clear terms of reference, quorum and tenure rules, conflict-of-interest registers, and an annual skills matrix to ensure coverage of seed systems, labs/quality, markets, finance, and inclusion. Meetings will be held quarterly; action minutes and centre scorecards will be published on centre noticeboards and websites. The Committee Chairs will participate in an annual governance retreat with HQ to escalate systemic issues (policies, certification bottlenecks, financing, standards) and to share lessons across centres.

5.2.3 Performance Compacts and Scorecards

Every centre will sign an annual Performance Compact with HQ that sets outputs, outcomes, resources, and service-level agreements. Compacts will include targets for validated packages, EGS and planting-material reliability, lab turnaround and QA pass rates, adoption and inclusion (with minimums of at least 40% women and at least 30% youth), centre revenue and co-financing, operations and maintenance execution, and partner satisfaction. A quarterly scorecard will draw data directly from MEL, LIMS, and ERP systems against locked Indicator Reference Sheets so that definitions, disaggregation, and tolerances are consistent. Results will be reviewed in quarterly performance calls involving HQ and the Centre Advisory

Committee, with colour-coded dashboards and short "explain and act" notes. High-performing centres will receive in-year flexibility - such as annual rewards, recognition, promotion, modest budget top-ups, priority access to equipment, or additional CPD slots—while chronic under-performance will follow a support-then-escalate ladder that begins with coaching and corrective action plans and, if necessary, temporarily tightens delegation until performance recovers.

5.2.4 HR Strategy (aligned with the 2023 Act)

People systems will align with the SLARI Act 2023 and the needs of a modern research organisation. Pay and grading will aim for parity with universities where feasible, and retirement-age rules for scientific staff will be harmonised. Policies on consultancy, intellectual property, authorship, and publication will be explicit. A capability pipeline will combine formal training and on-the-job development: a structured CPD ladder for technical, quality, data, and leadership skills; micro-credentials for lab QA, LIMS, biosafety, MEL, and data engineering; secondments with CGIAR, ARIs, and industry; and an Early-Career Programme that rotates recruits across labs, field operations, data/analytics, and extension over two years under mentorship. Succession plans will be maintained for all critical posts, including EGS management, lab QA, data engineering, and mechanisation. To attract scarce skills - seed science, analytical chemistry, bioinformatics, instrumentation, and cold-chain engineering - centres will use targeted incentives such as accelerated promotion windows, reasonable research start-up packages, and field hardship top-ups where appropriate. Performance management will run on annual goal setting tied to centre compacts, 360-degree feedback for supervisors, and a clear disciplinary pathway. Codes of conduct and safeguarding policies will be mandatory, with confidential speak-up channels, protection from retaliation, and time-bound case handling.

5.2.5 Knowledge and Communications

Knowledge will be treated as a public asset by default, protected where necessary and shared where it is most useful. Version-controlled, open repositories will host standard operating procedures, protocols,

datasets, briefs, and training materials with persistent identifiers to enable citation and reuse. A data policy will specify roles, retention, access tiers, attribution, and privacy requirements, including de-identification and role-based permissions. Lab data will flow through LIMS; field, validation, and adoption data will flow through MEL; and licensing will be explicit (for example, Creative Commons for non-sensitive materials). Science-to-practice products will translate findings into action: two- to four-page briefs, local-language radio scripts, and short how-to videos sequenced to the agricultural calendar. Media partnerships with radio, community stations, and agricultural magazines will be cultivated, and regular extension days at centres will keep end-users engaged. A brand and visual identity guide will ensure consistent and credit-accurate communication, including co-branding rules for PPPs and acknowledgement standards for collaborators and funders.

5.2.6 Governance Calendar and Interfaces

Governance will run on a predictable cadence. Quarterly, each centre will hold its advisory board meeting, review the scorecard with HQ, conduct a procurement and risk scan, and complete lab QA checks and inclusion audits. Twice a year, centres and HQ will conduct structured learning reviews with partners, HR talent reviews, and internal audit sampling. Annually, centres will renegotiate and sign their Performance Compacts, participate in the governance retreat, publish a Centre Annual Report covering results, finances, risks, and lessons, and contribute to an external evaluation slice focused on methods, data quality, and user impact. Throughout the year, centres will interface with regulators and standards bodies for certification and proficiency testing, with the Ministry for policy alignment and budget coordination, and with development partners through the Partnerships Window for pipeline management, compliance, and reporting.

5.2.7 Risk, Safeguards and Compliance (operationalised across all subsections)

Enterprise risk management will be embedded in planning and delivery. Each centre will maintain a live risk register covering finance, procurement, EGS and planting-material integrity, biosafety and lab safety, environmental and social safeguards, data privacy, cyber security, and reputational risk. Safeguards will include environmental screening for field and infrastructure works, occupational health and safety protocols, biosafety levels and chemical safety routines in labs, humane animal-care standards in livestock work, and human-subjects ethics where relevant. Data protection will rely on role-based access, encryption at rest and in transit where feasible, and clear consent language for data collection. Compliance will be verified through documented checks, periodic audits, proficiency testing, and corrective action tracking, with escalation criteria and timelines defined in the DAF.

5.2.8 Partnerships Window (legal, commercial and IP support)

A central Partnerships Window will provide standard contracts, pricing guidance for services, IP and data-use clauses, due-diligence checks, and templates for public–private collaboration. Centres will originate opportunities and negotiate technical scopes, while the Window will ensure that risk, legal, and brand considerations are consistently handled. Customer-satisfaction tracking, cycle-time metrics from concept to signature, and revenue and co-financing reports will be published alongside centre scorecards to encourage disciplined, market-credible engagement.

Chapter 6. Financing and Commercialization

Financing will keep SLARI mission-first while remaining agile and investable. The model will blend predictable core subvention (to protect salaries and essential O&M), growing competitive grants (to fuel research, validation, and scale-up), and disciplined commercial services (to recover costs, strengthen labs/EGS systems, and crowd-in private co-investment). All revenue-generating activity will sit under strong assurance so that income never drives mission drift. The glide-path will be calibrated to OP-I

"foundations for scale" and OP-II "markets and quality," and every centre will commit to transparent reporting, cost attribution, and quality management so that buyers and funders trust SLARI's offers and evidence.

6.3.1 Funding Mix Strategy and Targets

Core subvention will remain the platform for continuity - payroll, essential O&M, utilities, field vehicles, basic consumables, and minimum lab upkeep. Grants will expand priority pipelines that the ToC identifies as most catalytic (EGS/seed reliability, climate-smart packages, SPS/TBT readiness, digital advisory), while commercial income will recover costs on services that are legitimately within SLARI's mandate and quality systems. As a planning guide - refined each year in OP tables and centre compacts - **OP-I** will target approximately **50–60% core**, **20–40% grants**, and **10–20% commercial**. As Laboratories, LIMS, and services mature, **OP-II** will target approximately **40–50% core**, **25–35% grants**, and **15–25% commercial**. Each centre will set annual targets against this glide-path and will operate ceilings so that paid work may not displace public-good research or adoption support. A short **diversification rule** will apply at portfolio level (for example, no single donor or client to exceed 30–35% of annual external income), and the Funding Mix Scorecard (see 9.4) will flag concentration risk early.

6.3.2 Commercialization Unit (HQ)

A small HQ Commercialization Unit will provide structure and guardrails for bid development and fee-for-service work. For the Commercial Units at the Centre level to be effective, HQ will make the initial investment. These units will be operated through partnerships and proper infrastructure management.

Proposal Office. The Unit will maintain a live pipeline calendar of calls and a disciplined bid/no-bid process; standard boilerplates will cover ToC/OLM fit, gender and inclusion plans, environmental and social safeguards, MEL frameworks, budgets, and value-for-money logic. Donor compliance matrices and reporting calendars will be tracked centrally, with data pulled from centre MEL/LIMS/ERP to avoid duplication.

Pricing, IP, and licensing. The Unit will publish standard rate cards and IP/licensing templates. As a default, public-good outputs will use non-exclusive royalty-free terms; co-developed tools may use non-exclusive royalty-bearing licenses; narrowly time-bound exclusivity will be used only where law and ethics permit and where it demonstrably increases adoption and investment. Templates will include data-sharing, attribution, safeguarding, and AfCFTA/SPS disclaimers where relevant.

Client contracts and SLAs. Master Service Agreements will be available for lab testing, diagnostics, training, and EGS supply, with quality clauses referencing QMS, proficiency testing participation, turnaround times, service credits, liability limits, confidentiality, and dispute-resolution steps. Contracts will explicitly state that SLARI does not retail certified seed and will only supply EGS/planting material to licensed multipliers and public programmes under traceability and QA rules.

Reinvestment rule. Net surpluses from commercial lines will be ring-fenced by policy - illustratively 60% to the generating centre, 25% to shared services (QA/LIMS/ICT/legal), and 15% to a strategic innovation reserve) - and may fund research equipment/O&M, CPD, inclusion measures, and method validation. They may not have fund-based salaries or unrelated overheads.

6.3.3 Revolving Bridge Fund

A Revolving Bridge Fund (RBF) will smooth cash-flow between grant signature and first disbursement or when verified receivables are slow. The RBF will operate under a Board-approved policy specifying: (i) a capped size (for example, up to 10–15% of the annual operating budget or three months of essential O&M); (ii) strict eligibility (a signed award/contract or a Board-approved MoU with a clear disbursement schedule); (iii) tenor and recovery rules (for example, repay within 90 days of receipt; a small service fee to preserve real value); (iv) use-of-funds limits (no structural payroll; no speculative purchasing; only time-bound bridging or matched funding for competitive calls); and (v) governance (a credit committee, conflict-of-interest declarations, monthly exposure reports, and full ERP audit trail). Portfolio risk caps will apply per centre to avoid over-exposure to a single pipeline.

6.3.4 Annual Funding Mix Scorecard and Incentives

Each centre compact will include a Funding Mix Scorecard, published quarterly. Metrics will include the share of core/grants/commercial; number of proposals submitted and win rate; service utilisation (lab runs, training seats, EGS lots supplied); days-sales-outstanding (DSO) and collection rate; gross margin by

service line; QA compliance (proficiency testing pass rates, turnaround times); customer satisfaction scores; and concentration risk by donor/client. Positive incentives will include priority for equipment/CPD and in-year budget flex where both delivery and data quality are green. Persistent shortfalls or compliance breaches will follow a support-then-escalate pathway (coaching, corrective plan, temporary tightening of delegation). A red-line policy will prevent centres from exceeding their commercial time cap when public-good outputs (for example, adoption targets, EGS reliability, open knowledge releases) lag.

6.3.5 Products and Services within Mandate

Commercial activity will stay strictly within SLARI's public remit and national law. Laboratory and diagnostics services will include seed health, germination, purity; soil and fertiliser recommendations; moisture and quality testing; and selected residues/contaminants only where validated and permitted. Inter-lab comparisons and method validation will expand during OP-II. Training and certification support will cover short courses in seed and lab QA, HACCP-lite, IPM, protected cultivation, cold chain, mechanisation, and operator certification where appropriate. EGS and planting material will be supplied as breeder/foundation classes to licensed multipliers and public programmes, with full traceability (lot IDs, geo-tagging, LIMS records); SLARI will not retail certified seed. Field trials and co-validation for private R&D will be available on a fee basis under the voluntary disclosure window, with transparent protocols, ethical safeguards, and public-interest data release norms. Advisory products - plain-language guides, SOPs, and digital content - will be open and free by default; bespoke analytics or enterprise onboarding may charge cost-recovery fees, where justified. During OP-II, AfCFTA conformity support will offer templates and checks for traceability, labels, grade specifications, and basic SPS/TBT documentation, with referrals to accredited bodies for certification and inspections.

6.3.6 Pricing and Cost Recovery

Prices will be set via activity-based costing (ABC) and full economic cost (direct plus allocable indirects), updated annually alongside utilisation reviews and market scans. A published rate card will define tiers (public sector/education; MSME; large private; regional) with transparent volume discounts and documented waiver rules for public programmes and low-income users. Pre-payment or milestone billing will reduce DSO; cancellation and re-test policies will be explicit. Taxes/VAT, customs rules, and biosafety/export controls will be observed, and cross-border services will respect data and sample-movement regulations. SLARI will not pursue "loss-leader" pricing that undercuts private providers or that cannot be sustained without compromising quality.

6.3.7 Guardrails, Assurance, and Ethics

Mission-drift checks will be built into quarterly reviews and centre scorecards so that paid work cannot displace mandated research, validation, or dissemination. Public-good KPIs will be expected to remain green before a centre expands paid lines. Procurement will respect segregation of duties, supplier rotation, and conflict-of-interest registers; a gifts and hospitality policy will be enforced alongside spot audits. IP and benefit-sharing rules will ensure that germplasm access follows material transfer agreements and that co-developed tools respect partner IP while preserving farmer access; no exclusivity will apply to public germplasm except where narrowly time-bound and justified by clear public benefit. Quality and liability will be managed through QMS implementation, proficiency testing participation, corrective-action SOPs,

and professional indemnity cover where needed. Data protection will rely on role-based access, de-identification, retention schedules, breach protocols, and client consent for any secondary use; client data will not be used for marketing without explicit permission. Ethical walls will separate evaluation of private R&D submissions from any related procurement decisions.

6.3.8 Business Development and Partner Segmentation

Each centre will hold a modest business-development target and a small account list, coordinated by an HQ CRM linked to ERP/MEL. Prospective partners will include donors and foundations, value-chain corporates (milling, processing, input firms), MSMEs, standards bodies, universities/ARIs, and development banks. Quarterly pipeline reviews will track leads, proposals, closure rates, client feedback, geographic and sector balance, and product mix so that income remains broad-based rather than dependent on a single buyer or donor. Where conflicts or capacity limits arise, HQ will re-balance opportunities across centres.

6.3.9 Reporting and Transparency

SLARI will publish an annual Financing and Commercialization Report disclosing centre-level funding mixes, service volumes, QA performance, rate-card updates, client satisfaction, RBF usage and recoveries, and reinvestment flows (for example, what equipment, QA, CPD, or inclusion measures were funded). Summaries will be public, while commercially sensitive terms will be redacted but available to auditors and the Board. Centre Annual Reports will cross-reference the Results Framework so that external readers can see how financing translated into outputs and outcomes.

6.3.10 Typical Risks and Mitigations

Receivables drift will be managed through deposits and milestone billing, automatic reminders, suspension of services beyond 60–90 days, and small early-payment discounts. Over-reliance on a single funder or client will be contained through diversification thresholds and pipeline management. Quality failures or disputes will be addressed through proficiency testing participation, corrective-action SOPs,

incident logs, and, where appropriate, service credits. Staff overload will be managed through commercial time caps, rota systems, and reinvestment into additional technicians once utilisation is proven. Reputational risk - particularly perceptions of elitism or mission drift - will be contained by publishing public-good outputs first, maintaining fee waivers for low-income users and public programmes, and keeping advisory content open and accessible in local languages.

CHAPTER 7 Monitoring, Evaluation and Learning (MEL)

MEL will be designed to achieve three things: verify results credibly, trigger timely course-corrections, and generate practical knowledge for farmers, SMEs, policymakers, and partners. The system will combine routine performance tracking with targeted adoption and outcome studies, embed data quality at the source (Laboratories, field operations, and finance), and institutionalise learning at centre and Institute levels. Evidence standards will be proportionate to decision needs: management decisions will rely on fast, good-enough signals, while strategic pivots and external reporting will draw on more rigorous studies and evaluations.

7.1 MEL Architecture

Indicator Reference Sheets (IREFs). Every indicator in the Results Framework will have a signed IREF that specifies the definition and formula, units, disaggregation requirements (sex, age/youth, disability where feasible, location), baseline and target logic, frequency, primary and secondary data sources, ownership and approval roles, and mandatory data-quality checks. IREFs will live in a version-controlled repository; changes will follow a simple change-control workflow with justification and time-stamped approvals. Centres will reference the relevant IREFs directly in their annual compacts and seasonal workplans.

Digital Data and Dashboards. Field and Laboratory data will be captured digitally. Enumerators will use mobile forms with built-in logic and geo-time stamps; Laboratories will record tests, calibrations, and sample custody in LIMS; finance and procurement will post transactions through ERP. The MEL dashboard will auto-pull approved data to show centre scorecards covering outputs, QA, inclusion, funding mix, and partner satisfaction, with drilldowns by value chain, season, and district. Data freshness indicators and data-quality flags will be visible so managers can distinguish “live but provisional” from “final and checked.”

Quarterly Learning Reviews (QLRs). Each quarter, centre teams and HQ will jointly interpret dashboard trends, examine red flags—such as low adoption intent among a target group, delayed lot release, or lab turnaround failures—agree corrective actions with owners and deadlines, and record stop/scale/adapt decisions. Short “explain–and–act” notes will capture the rationale and will be revisited in the next review to check whether actions worked.

Adoption and Outcome Studies. At least once per year per centre, structured studies will measure adoption (rate, intensity, and persistence), yield uplift and variance reduction, quality grades, and net margins for farmers and partner SMEs, complemented by qualitative user experience on benefits, constraints, and gendered impacts. Where feasible, remote sensing will supplement area and performance estimates, with crop masks and QA scripts documented in the repository.

Periodic Evaluations. A mid-term review in 2029 will test core ToC assumptions, delivery efficiency, and early outcomes to calibrate OP-II. An end-term evaluation in 2035 will assess achievement of outcomes and impact, cost-effectiveness, inclusion and equity, and sustainability, and will draw on independent technical oversight and external peer review of methods.

7.1.1 Core indicators (definitions and sources)

Adoption percentage will measure the share of eligible farmers using all core elements of a validated package in the current season, using adoption surveys triangulated with demonstration registers; the indicator will be disaggregated by sex, youth, and district. Adoption intensity will capture the proportion of cultivated area under the target variety or practice, using plot measurement and, where feasible, remote sensing. Yield uplift will be estimated from crop-cuts or calibrated farmer records and will include variance reduction as a resilience proxy. Income uplift or net margin will compare gross output to input, labour, and service costs against baseline values, and will include SME sales and margins where pilots target processors or service firms. Hectares under improved seed or planting material will triangulate certification and sales records with survey evidence. EGS reliability will track breeder and foundation tonnes by class and variety against plan, inspection pass rates, and lot release turnaround times. Laboratory capability will record the number of operational labs, methods validated or accredited, proficiency-testing pass rates, and turnaround time. Operations and maintenance execution will show the share of approved O&M actually spent by centre. Funding mix will display the proportions of core, grants, and commercial revenue, proposal win rates, and receivables and collections. Partnerships will count active MoUs and PPPs meeting milestones and report partner satisfaction scores. Climate and NRM proxies will include soil organic carbon where sampled, adoption of conservation agriculture, cover crops and IPM, water-use efficiency, and a pesticide-risk index. Inclusion will track the percentages of women and youth in Innovation Platforms, trials, lead-farmer

roles, and training cohorts, plus accessibility adaptations implemented and timely grievance resolution. Full IREFs will sit in Annex 6 and on the repository.

7.1.2 Measurement Quality and Safeguards

Design and Peer Review. All protocols - trials, surveys, and Laboratory methods - will undergo internal peer review. Where human subjects or sensitive data are involved, appropriate ethics approvals and informed-consent procedures will be obtained and documented.

Enumerator and Technician Standards. Enumerators and lab technicians will be certified annually on SOPs, safeguarding, informed consent, privacy, and data-capture tools. Supervisors will conduct spot checks and paired revisits on at least a tenth of records, and results will feed the dashboard's data-quality flags.

Automated Controls. Mobile forms will enforce logic and range checks; GPS and time stamps will verify presence and timing. LIMS will enforce sample custody, calibration logs, analyst sign-off, and instrument status; ERP will enforce maker–checker controls and contract performance checkpoints.

Data Quality Assessments (DQAs). Each quarter, centres and HQ will reconcile source documents to databases—for example, field sheets to dashboard records, LIMS logs to certificates, and ERP transactions to scorecards. Corrective actions will be recorded, owners assigned, and closure tracked; repeated issues will trigger coaching or method updates.

Privacy and Cyber-hygiene. Role-based access, de-identification for person-level data, secure backups, and an incident-response playbook will be standard. Participants will have grievance and opt-out options, and data retention schedules will be visible in the data policy.

7.1.3 Adoption and Outcome Study Designs

Core Design. Studies will use panels or rotating panels in target geographies with appropriate comparison groups. Analytical approaches will include difference-in-differences or ANCOVA; where randomisation is feasible - for example, in phased rollouts—stepped-wedge or clustered designs will be used. Fidelity checks will confirm that delivery matched the package specification before attributing effects.

Sampling. Power calculations will target minimum detectable effects appropriate for management decisions - illustratively eight to twelve percent yield change at 80 percent power - while ensuring stratification by sex, youth, and agro-ecology. Sampling frames, weights, and non-response handling will be pre-registered in the protocol.

Cost-effectiveness. Studies will track cost per adopter, cost per incremental tonne or percentage yield gain, and benefit–cost ratios at both package and programme levels. These metrics will inform go/no-go decisions for scale and will be reported alongside adoption and outcome results.

Bias Management. The programme will mitigate selection and social-desirability bias through independent data teams, neutral framing, and cross-checks using sales and lot data, remote sensing, and buyer grade records. Sensitivity analyses will be documented in technical annexes.

7.1.4 Learning Loops (from data to decisions)

After-Action Reviews at IP level. After each season, centres will hold structured reflections with farmers, SMEs, extension services, and local authorities to decide what to keep, stop, or adapt. Decisions and responsibilities will be logged directly into next season workplans and budget lines.

Quarterly Learning Reviews. Centre teams will use dashboard signals to test hypotheses—for example, why adoption dipped among women or youth in a specific district—and will run rapid, low-cost experiments such as alternative incentive designs, adjusted delivery channels, or revised timing. Results will be documented and, where positive, absorbed into the standard package.

Annual Research-to-Policy Dialogues. National sessions with MAFS, standards and plant-health authorities, the private sector, and development partners will translate findings into seed and certification rules, QA improvements, SPS and TBT steps, and funding priorities. Where appropriate, briefs will include suggested regulatory text and costed implementation options.

Synthesis Notes and Briefs. Short, plain-language notes will distil what worked, for whom, at what cost, and what should change next cycle. Notes will be posted in the open repository and shared via media partners and digital channels in local languages.

7.2 Roles, Responsibilities, and Calendar

Roles**.** Each centre will designate a MEL Focal Point who will own routine data capture, scorecards, QLRs, after-action reviews, and adoption studies, with methods and data-engineering support from HQ. The HQ MEL and Data Team will maintain the IREF library, dashboards, and DQAs; design or quality-assure evaluations; manage the open repository; and commission the independent mid-term and end-term

evaluations. A designated Data Protection Officer will oversee privacy compliance, consent language, and incident responses.

***Calendar*.** Quarter one will focus on baselines, procurement of measurement tools, and enumerator and technician training. Quarters two and three will focus on execution, QLRs, and rolling DQAs. Quarter four will conduct adoption and outcome studies, centre and national after-action reviews, the Annual Learning Review, and target-setting and compact renewal for the next year. In parallel, Laboratories will run proficiency testing on a defined cadence, and centres will complete inclusion audits and grievance-response summaries on a quarterly schedule.

7.3 Risk, Assumptions and Mitigation

SLARI will operate a live Enterprise Risk Register (ERR) that captures risks, named owners, early-warning indicators, thresholds, mitigations, and residual ratings. The ERR will be reviewed quarterly alongside centre scorecards and again at the annual governance retreat. Risks will be grouped into strategic, financial, operational, compliance, and reputational clusters, with an explicit risk-appetite statement: low tolerance for integrity, safety, and data-privacy breaches; moderate tolerance for managed implementation risk during innovation and scale-up. Where risks materialise, decision logs will record the trade-offs, the chosen response, and the timeline for returning to steady state.

Strategic assumptions to monitor. The ToC depends on several external conditions: predictable core financing; functioning certification and quality systems (seed services, standards, plant health); supportive PPP and data-sharing policies; climate shocks remaining within modelled ranges; and sustained partner co-financing. These assumptions will sit on the ERR with “assumption tests,” evidence sources, and contingency actions.

7.3.1 Finance and Cashflow

Risk. Core under-release or delayed disbursements, slow receivables from grants or clients, and foreign-exchange shocks may stall operations and compromise delivery.
Early Warnings. Budget execution falls below 80% by quarter three, days-sales-outstanding beyond 60 days, variance versus the approved cashflow plan exceeding 20%, or quarter-on-quarter FX movement above 10% will trigger review.
Mitigation. A Revolving Bridge Fund will smooth out gaps between award signature and first disbursement under Board-approved caps and recovery rules. Centres will phase procurement and, where possible, draw down on framework agreements to match cash inflows. A quarterly grants pipeline will enforce bid/no-bid discipline and assign match-funding allocations in advance. Client contracts will favour pre-payments or milestone billing, include modest early-payment discounts, and embed FX clauses and buffers for imported equipment. Treasury will run twelve-month rolling forecasts with scenario tests, and finance will complete monthly bank and ERP reconciliations.
Residual Controls. Monthly treasury meetings will monitor runways; non-critical lines will be paused if unrestricted cash falls below sixty days; and the Funding Mix Scorecard will flag concentration risk by donor or clients.

7.3.2 Human Resources (Capacity and Continuity)

***Risk*.** Attrition in scarce skills and burnout during peak seasons can erode service quality and slow research cycles.
Early warnings. Vacancies remaining open beyond ninety days, lapsed CPD, overtime more than twenty percent above baseline, and recurring themes in exit interviews will prompt action.
Mitigation. A structured CPD ladder, mentoring, authorship and conference opportunity, and targeted incentives for hard-to-staff roles (field hardship, start-up kits) will strengthen retention. Succession plans will be maintained for all critical posts, supported by a visiting-scientist scheme with CGIAR/ARIs/industry and an alumni short-term roster to plug gaps. Wellness and rota planning will smooth peaks, with explicit overtime caps and compensatory rest.
Residual Controls. An HR dashboard will report quarterly to the Executive Committee; recruitment SLAs will set timelines from requisition to offer; and periodic workload reviews will adjust staffing or scope.

7.3.3 Infrastructure, Laboratories and ICT

Risk. Power outages can damage equipment and break cold chains; connectivity instability, instrument downtime, or cyber incidents can delay results and jeopardise data.
Early Warnings. System uptime below ninety percent, overdue calibrations and maintenance, repeated sample backlogs, failed backup-restore tests, or phishing-test failures will trigger escalation.
Mitigation. Critical labs will be covered by right-sized backup power (solar/inverter/generator), surge protection, and UPS on instruments. Preventive maintenance and calibration schedules with critical spares and vendor service contracts will be enforced. Dual-path ISP SLAs with automatic failover and network segmentation will reduce connectivity risk. **Cyber hygiene** will include MFA, a patching cadence, role-based access, encrypted backups with quarterly restore tests, and a rehearsed incident-response playbook with tabletop drills.
Residual Controls. LIMS and ERP alerts will flag due O&M; penalty clauses in vendor SLAs will apply for missed uptime; and asset registers will record warranty and lifecycle status for replacement planning.

7.3.4 Climate and Disasters

***Risk*.** Droughts, floods, storm surges, or pest and disease outbreaks beyond modelled ranges can disrupt trials, seed production, and market access.
Early Warnings. Seasonal forecasts at extreme percentiles, consecutive shock events, unusual pest pressure, or salinity spikes at coastal sites will activate contingency mode.
Mitigation. Trials will be diversified across sites and planting will be staggered to spread exposure. Portfolios will include stress-tolerant lines; contingency EGS blocks and emergency testing will be maintained. Coastal platforms will implement bund and sluice upgrades and low-cost salinity monitoring. Integrated pest surveillance will feed rapid guidance and, where feasible, SLARI will test index-insurance pilots with partners. Business-continuity plans will define evacuation and re-location procedures, emergency communications, and minimum viable service for labs.
Residual Controls. Yield retention in shock years will be reported as a headline resilience metric; lessons will feed the next season's design.

7.3.5 Governance and Integrity

Risk. Delegation drift (threshold bypassing, split purchases), conflicts of interest, opaque partnerships, or weak documentation can undermine credibility and funding.
Early Warnings. Red-flag analytics such as repeat vendors and split purchase orders, late deliverables, board or partner complaints, and audit findings will prompt investigation.
Mitigation. Ex-post audits and random checks will validate compliance with the Delegated Authority Framework. Annual compact reviews and published scorecards will strengthen transparency. Whistle-blower channels with protections will be maintained. Conflict-of-interest registers, gifts and hospitality logs, and rotation of sensitive roles will reduce exposure. Standard MoUs and compacts will include disclosure, data/IP clauses, inclusion and safeguarding, and termination rights.
Residual Controls. Corrective-action plans will be tracked to closure; a sanctions ladder will apply for repeated non-compliance; and audit recommendations will be linked to performance reviews.

7.3.6 Delivery and Adoption

Risk. Tokenistic participation, low adoption, or misalignment with buyer requirements can stall outcomes.
Early Warnings. Low adoption intent on user scorecards, weak buyer grades, under-representation of women or youth in pilots, or poor last-mile availability of inputs will trigger redesign.
Mitigation. Strong Innovation Platforms and seasonal Co-creation Clinics will maintain user pull. Packages will include clear buyer specifications and pull incentives such as price-for-quality premiums and off-take agreements. Inclusion enablers - stipends, childcare, accessible venues, local-language content - will be budgeted. Rapid A/B tests will compare delivery channels, incentive structures, and advisory formats; weak variants will be stopped early.
Residual Controls. Stop/scale/adapt decisions will be recorded in Quarterly Learning Reviews; budget reallocation rules will shift resources to higher-yield approaches within the same season.

7.3.7 Risk Governance Mechanics

Ownership and Cadence. Each risk will have a named owner at centre level and an HQ counterpart. Centre risk logs will feed the Institute-level ERR; heatmaps will inform oversight and audit plans. The PMO will coordinate quarterly reviews; the Executive will consider high-rated items and decide on escalations.

Escalation and Thresholds. Traffic-light thresholds will trigger Executive attention and, where necessary, temporary tightening of delegated authorities. Material incidents will be reported to the Board through the Risk and Audit Committee.

Transparency. Material risks and mitigations will be summarised in the Annual Report; sensitive details will remain under audit confidentiality. Training on risk, controls, and reporting will be part of induction and annual refreshers so that risk management remains a day-to-day discipline rather than a periodic exercise.

PART II: OPERATIONAL PLAN

7.4 Infrastructure, Labs and ICT

7.4.1 Labs

A phased rehabilitation programme will prioritise the highest-leverage Laboratories (seed health, soil/fertiliser, food/produce quality; later, residues/contaminants where feasible) to restore utilities, benching, ventilation, cold storage, and instrument readiness. Each lab will operate under a light but rigorous Quality Management System with QA/SOP manuals, method files, sample chain-of-custody, logbooks, and non-conformance/corrective-action registers. Where feasible, labs will work toward method validation and stepwise accreditation readiness (e.g., ISO/IEC 17025-aligned practices), including proficiency testing and inter-lab comparisons. An equipment O&M plan will list preventive-maintenance tasks, calibration schedules, and service contracts, with minimum spare-parts inventories and up-time targets (e.g., ≥90% for core instruments). Biosafety provisions will cover PPE, chemical hygiene, fume/biological safety where applicable, waste segregation and disposal, incident reporting, and annual drills; all staff and trainees will receive routine safety induction and refresher training. Every test result will be traceable to a sample, analyst, instrument, SOP version, and calibration event through the LIMS.

7.4.2 Field Infrastructure

Field platforms will be designed for reliability and learning. Centres will deploy irrigation kits appropriate to context (low head/solar pumps, gravity/drip sets, lay flat conveyance, simple filtration) with scheduling guides that link water to phenology. At RARC, tidal/coastal works will include bunds, sluice/flap gates, and drainage/flush designs informed by tide charts and salinity monitoring (portable EC meters, sentinel piezometers), with EHS protocols to avoid mangrove loss and protect fisheries nurseries. Horticulture centres will install screenhouses/net-houses and nursery hygiene zones to support clean seedling production and IPM; post-harvest pilots will add cold rooms/pre-coolers sized for MSMEs (evaporative coolers, solar-hybrid cold rooms) with SOPs for sanitation, temperature logging, and product flow. All assets will have O&M rosters (responsible person, frequency, spares), simple visual checklists, and a fault-reporting channel that triggers timely repairs. Site selection will consider accessibility, inclusion (paths, latrines), and resilience to storms/floods; where possible, structures will use locally serviceable components.

7.4.3 Digital

A minimum digital stack will link science, finance, and delivery. Connectivity will be upgraded to each centre with primary broadband and a low-bandwidth fallback; internal LAN/Wi-Fi will segregate lab

instruments from office traffic. A Laboratory Information Management System (LIMS) will manage sample registration, test workflows, QA, instrument/calibration logs, and result authorisation; it will interface with seed/traceability and the MEL system. The MEL dashboard will visualise centre scorecards (outputs, QA, adoption/inclusion, finance mix, partner satisfaction) with drilldowns by programme and season. An open repository will host SOPs, protocols, datasets, and plain-language briefs under clear licences; data standards (metadata fields, variable dictionaries, disaggregation rules) will be enforced via templates and Indicator Reference Sheets. Cyber hygiene will include role-based access, MFA, password and patching policies, automated backups with off-site copies, endpoint protection, and an incident-response playbook with quarterly restore tests. Data protection (consent, de-identification, retention) will be embedded in all field and lab workflows.

Chapter 8 Centre Mandates and Focus

8.1 Rokupr Agricultural Research Centre (RARC)

8.1.1 Challenges and Constraints

Ecology and water control. Rice in Sierra Leone is heavily rain-fed, with very limited managed irrigation; inland valley swamps (IVS) and mangrove lowlands face seasonal flooding, salinity intrusion and drainage challenges that depress yields and raise risk (World Bank, 2024; AfricaRice, 2022). Practical constraints include weak bund/sluice design and maintenance, and limited water-level monitoring to optimize irrigation windows (Johnson et al., 2024; World Bank, 2024; Africa Rice, 2022; Johnson et al., 2024).

Seed and varietal turnover. Sierra Leone's rice seed system shows bottlenecks from breeder/foundation seed through certified supply - fragmented planning, limited field inspection capacity, and variable QA slow turnover to stress-tolerant varieties (NRDS2; FAO Seed Landscape, 2025; FAO, 2025; GoSL/NRDS2).

Post-harvest and quality. High humidity and scarce drying infrastructure lead to moisture and impurity problems; artisanal parboiling often yields variable quality and smoke exposure. Studies across West Africa

show improved parboiling (e.g., AfricaRice GEM) and low-emission dryers reduce breakage and improve grades, but adoption requires training and capital (Ndindeng et al., 2015; Mihret et al., 2024; Baidhe et al., 2024).

Market exposure. Import dependence and logistics costs transmit global price shocks to domestic markets, increasing volatility for farmers and millers; this raises the bar for competitive quality and standards compliance (World Bank, 2024).

8.1.2 Strategic Focus

RARC will operate as SLARI's rice powerhouse for lowland and upland ecologies in Sierra Leone as well as a Regional Centre of Excellence for mangrove rice across West and Central Africa, with a secondary mandate on maize sorghum and digitaria as secondary crops for coastal/lowland systems. It will anchor the EGS hub for rice, integrate coastal/tidal infrastructure R&D (bunds, sluices, salinity management), and drive post-harvest mechanisation and quality (harvesting, drying, milling, parboiling). All lines will pass through Innovation Platforms, seasonal Co-creation Clinics, and farmer-managed validation plots in surrounding chiefdoms. RARC will collaborate with MLWERC in conducting research on soil nutrient management.

8.1.3 OP-I (2026–2030)

By 2030, RARC will reliably deliver seed, quality-assured packages, and buyer-aligned post-harvest solutions in coastal/lowland ecologies as well as across West and central Africa.

Labs and field platforms. RARC will rehabilitate rice labs (seed health, moisture/impurity testing, grain quality) and deploy LIMS linking plots, seed lots, and QA records. Tidal/mangrove field platforms will be

established to test varieties and agronomy under real tidal regimes (bund/sluice designs, planting windows, salt-flushing, water-level management). SOPs will embed EHS, informed consent, and biodiversity safeguards (no-net-loss of mangrove; fish-nursery considerations).

EGS pipeline and certified seed. Each season, RARC will publish and deliver the breeder/foundation plan (classes, varieties, hectares, target tonnes, inspection calendar). Framework contracts will pre-qualify multipliers, specify traceability (lot IDs, geo-tags), and QA thresholds (germination, purity, health). EGS/QA bulletins will publish planned vs. actual volumes, pass rates, and release timelines. A contingency EGS block and rapid testing capacity will hedge climate/pest shocks.

Coastal/tidal infrastructure research. With MAFS/districts/standards and plant-health authorities, RARC will trial bund/sluice configurations, low-cost salinity monitoring, and flush schedules to keep root-zone salinity within tolerance. Packages will include layout templates, boqs, community O&M rosters, and risk notes (overtopping, sedimentation). Environmental screens will ensure nature-based stabilisation and mangrove protection.

Post-harvest mechanisation and quality. RARC will pilot harvest/thresh/dry options suited to high humidity (tarps/rack designs, moisture targets, handheld meters) and milling/parboiling options to reduce breakage and smoke exposure. A quality toolkit will define quick checks (moisture 12–14%, impurity %, whole/broken ratio) and buyer-facing specs. Parboiling will be standardised (stoves, soak/steam profiles,

water-change protocols). Fortification pilots (premix compatibility, dose control) will be explored with standards/food-safety authorities and millers.

IPs with millers, traders, financiers. Quarterly IPs will prioritise bottlenecks (seed timing, land prep, drying/storage, quality premiums), broker off-take, and cost incentives (lead-farmer commissions, price-for-quality, input credit tied to delivery). Clinics will convert decisions into seasonal protocols and scorecard-based validation.

Capability, governance, MEL. RARC will sign a Centre Performance Compact (delegated procurement, SLAs, quarterly scorecards). Staff CPD will cover seed QA, tidal agronomy, post-harvest engineering, data/ICT. The MEL dashboard will track EGS reliability, adoption, yield uplift, quality grades, and partner satisfaction; inclusion metrics will ensure ≥40% women and ≥30% youth across events and leadership roles.

Indicative OP-I KPIs:

- EGS rice produced (t) vs. plan; % lots passing QA on time.
- tidal/mangrove trials; % plots meeting salinity windows.
- Post-harvest loss reduction (%) and whole-grain yield (%).
- PPP pilots; # off-take MOUs; buyer grade conformity (%).
- Women/youth participation in demos/lead roles (%).

8.1.4 OP-II (2031–2035)

By 2035, RARC will provide regional services - multi-country validation, EGS/lab support, and training - anchored in export-ready standards and market-credible quality systems.

Positioning and services. RARC will become a multi-location validation hub with (i) harmonised protocols and joint data standards; (ii) EGS supply under cross-border agreements; (iii) lab services (seed health, grain quality, residues/contaminants where feasible) with accreditation/validated methods; and (iv) training/certification for multipliers, millers, and QA technicians.

Quality parboiled and fortified rice at scale. RARC will standardise parboiling SOPs, HACCP templates, and OHS guides; support fortification scale-up (dose control, QC logs, packaging/label integrity); and tie adoption to buyer audits and public procurement specs.

Export-ready standards and AfCFTA conformity. Protocols and labs will align to SPS/TBT (method validation, traceability, labelling). RARC will support mills to meet regional grade standards and will run ring tests/proficiency and ISO-aligned QMS, integrating digital traceability (lot code ↔ LIMS).

Services and cost recovery. Through MoUs and fee-for-service, RARC will supply EGS, host field schools, and license content. A Partnership Window will manage contracts, IP, and customer satisfaction/turnaround.

Indicative OP-II KPIs:

- regional trials completed; data releases on schedule (%).
- accredited methods; PT pass rate (%).
- % mills meeting target grades; # fortified lots compliant.
- Service revenue ($) and client satisfaction (score/5).

Key risks and mitigations (RARC): coastal flooding/salinity (elevated bunds, emergency drains, calendar shifts); EGS contamination (strict rogueing, isolation distances); quality drift (regular calibration, audits); energy constraints (efficient stoves/dryers, solar options).

8.2 Njala Agricultural Research Centre (NARC)

8.2.1 Challenges and Constraints

Clean planting material and disease risk (cassava). Cassava mosaic disease (CMD) remains a major constraint in West Africa; clean, traceable planting material supply is thin. Rapid multiplication via Semi-Autotrophic Hydroponics is a proven option to accelerate dissemination of healthy plantlets but requires basic facilities, QA and cost recovery (IITA/TAAT, 2024; Wosula et al., 2024; Saffa et al., 2025).

Processing quality and SME constraints. For HQCF, starch and gari, MSMEs face energy and water constraints, inconsistent moisture control, and limited HACCP-lite SOPs, which hinder reliable quality and buyer confidence (ITC/WACOMP; FAO/IFAD supervision) (ITC/WACOMP, 2024; IFAD, 2024).

Legume seed and food safety. Groundnut/soybean systems face seed quality gaps and aflatoxin risk without good post-harvest and testing routines; strengthening certified seed and QA is critical to marketability (FAO/Seed Landscape; regional reviews) (FAO, 2025; regional seed/QA reviews).

8.2.2 Strategic Focus

NARC will lead roots, tubers and legumes - cassava, sweet potato, yam, groundnut, cowpea, soybean—with a strong value-addition and SME orientation. It will push farmer-preferred, climate-resilient varieties and rotations (cassava–legume) while ensuring clean, traceable planting material. Value-addition will translate on-farm gains into income via HQCF/starch/gari standards, cleaner processing, and viable MSME business cases. NARC will collaborate with Njala University, Ernest Bai Koroma University, NERA and SLNet Agency (noting that SLNet Agency is mainly for climate change studies).

8.2.3 OP-I (2026–2030)

Planting material integrity. NARC will establish SAH (semi-autotrophic hydroponics) rapid multiplication for clean cassava plantlets, complemented by community nurseries under framework contracts and QA/traceability (lot IDs, mother-block maps, virus indexing, rogueing).

***Legume EGS*.** For groundnut/soy/cowpea, NARC will run EGS pipelines, pre-qualify licensed multipliers, and synchronise inspections with certification services.

Processing packages. NARC will co-create HQCF/starch/gari packages: varietal specs (dry matter, cyanide where relevant), moisture targets, energy/water-efficient workflows, HACCP-lite SOPs, and packaging/label guidance.

SME incubation and advisory. A light incubation window will help processors with line balancing, quality checks, and unit-costing. Digital advisory will convert validated practices into local-language radio/SMS/IVR timed to seasonality and market windows.

IPs and inclusion. IPs will convene farmers, processors, agro-dealers, buyers, and finance to remove bottlenecks; inclusion thresholds (≥40% women, ≥30% youth) will apply across clinics, trials, and field days.

Indicative OP-I KPIs: SAH plantlets produced and survival (%); hectares under **clean cassava**; EGS tonnes vs. plan for legumes; number of licensed multipliers; % processors meeting moisture/quality specs; SME sales/jobs (sex/age disaggregated).

8.2.4 OP-II (2031–2035): Smart Specialisation

NARC will specialise as a starch/HQCF excellence node and leader in cassava–legume rotations. A co-validation lab (with method validation where feasible) will provide a voluntary window for private R&D (varieties, enzymes, dryers, packaging). Rotation packages will be optimised for nutrient balances, soil cover, weed/pest pressure, and profitability; business models will include shared services (peelers, graters, presses, dryers) and buy-back schemes. Standards will align to regional buyer specs and AfCFTA pathways (traceability, labelling, residues), enabling SME sales beyond local markets.

Indicative OP-II KPIs: starch/HQCF yield and quality (%) by spec; rotation adoption (% area); SME contract sales ($); number of labs/partners using validated methods.

Key risks and mitigations (NARC): virus/bacterial diseases (strict mother-block QA, indexing, rogueing); mis-labelling (QR/lot IDs); SME cash-flow gaps (staged upgrades, buyer-linked finance); inclusion slippage (site/time rotation, stipends/childcare, local-language tools).

8.3 Kenema Forestry and Tree Crops Research Centre (KFTCRC)

8.3.1 Challenges and Constraints

Nursery integrity and planting material. Weak nursery QA (substrate, shading, labelling) and limited budwood/clonal garden systems undermine genetic gains and traceability for tree crops (IFAD, 2024; ITC/WACOMP).

Farm-gate quality protocols. High humidity and intermittent sunshine complicate cocoa fermentation/drying; lack of fermentation boxes, raised beds, moisture meters and proper storage drives mold/defect rates and price discounts. Coffee faces similar handling and grading issues, with limited cupping capacity and buyer linkages (ITC, 2023; Coffee Barometer, 2023).

Standards and residues/compliance. Emerging EU/market due-diligence and residue expectations raise SPS/TBT demands (traceability, MRL awareness, ICS for certification). Capacity building is underway regionally (ECOWAS/WACOMP), but domestic conformity assessment remains a bottleneck for SMEs (UNIDO/WACOMP, 2024; WTO TBT, 2024).

Cashew quality and markets. Kernel grading standards (e.g., AFI) and defect tolerances define price; operators need consistent drying, shelling and food-safety SOPs; regional cashew growth intensifies competition, making quality systems decisive (AFI; ACA/CBI).

8.3.2 Strategic Focus

KFTCRC will focus on the provision of commercial forest trees (e.g., Gmelina, teak), drive cocoa, coffee, oil palm, cashew, coconut improvement with an end-to-end view: clean planting material, GAPs, farmer-led quality protocols, and progressive steps toward certification-ready supply (traceability, residues, sensory).

Capacity building for farmers will be key to improve the productivity of crops at the farmers' field and will collaborate with MIRO Forestry, Njala University and Ernest Bai Koroma University

8.3.3 OP-I (2026–2030)

KFTCRC will rehabilitate nurseries, establish clonal gardens/budwood orchards, and standardise substrate, shade, irrigation, and hardening with QA checklists. Disease surveillance (pod rots, wilts, stem/leaf diseases; pest hotspots) will inform IPM packages and alerts. Farmer-quality protocols will be co-created: cocoa/coffee fermentation and drying profiles; oil-palm FFB handling; cashew grading; coconut selection and establishment. Seedling certification pilots will test tagging/QR codes, nursery audits, and paper trails that follow trees into early bearing. Extension kits, cupping/bean-cut demos, and local-language posters will embed quality at village level.

Indicative OP-I KPIs: Number of nurseries meeting QA; number of certified/traceable seedlings; adoption of quality protocols; moisture/defect conformity (%); number of cupping/sensory sessions; number of buyer linkages.

8.3.4 OP-II (2031–2035)

KFTCRC will run multi-location progeny/clonal trials and provide quality services: sensory (coffee cupping, cocoa flavour), residue testing (where feasible via validated or partner labs), moisture/defect grading, and certification support (traceability templates, ICS, audit readiness). The hub will train nursery operators and producer groups; MoUs with buyers/coops will link premiums to verified quality and compliance.

Indicative OP-II KPIs: Number of trials advanced; # producer groups audit-ready; % shipments meeting buyer specs; # premium contracts signed.

Key risks and mitigations (KFTCRC): pathogen outbreaks (surveillance, sanitation); nursery fraud (audits, traceability); humidity-season drying risks (solar dryers, raised beds, meters); price volatility (diversified buyers, quality premiums).

8.4 Kabala Horticultural Crops Research Centre (KHCRC)

8.4.1 Challenges and Constraints

Production risks. Open-field horticulture contends with pest pressure, variable rainfall and limited IPM inputs; protected cultivation (screenhouses, drip/fertigation) is scarce due to upfront costs and service gaps (regional horticulture evidence).

Post-harvest and cold chain gaps. Sierra Leone's cold chain is nascent; studies describe an "absence of evidence of any modern cold chain," with widespread temperature abuse, rough handling, and basic packhouse deficits - driving high losses and quality failures for domestic and regional buyers (UC Davis Postharvest Africa review, 2019).

Standards and food safety. Meeting ECOWAS/Codex-aligned MRLs and hygiene norms requires packhouse SOPs (water quality, sanitation, traceability) and access to labs; SLSB adopts Codex and ISO/AOAC methods but testing coverage and user readiness are limited (SLSB, 2023; U.S. Trade, 2024).

8.4.2 Strategic Focus

KHCRC will lead vegetables and fruits with emphasis on protected cultivation and cold chain, translating horticulture into nutrition and income for women and youth while meeting domestic - and progressively export - quality. KHCRC will support SMEs and collaborate with Njala University and Ernest Bai Koroma University.

8.4.3 OP-I (2026–2030)

KHCRC will install screen/net-houses and drip fertigation to validate pest- and water-smart packages (variety choice, nursery hygiene, biocontrols, IPM, fertigation schedules). Post-harvest pilots will include evaporative coolers, solar cold rooms, pre-cooling routines, hygienic crates, and pack-house SOPs (grading, wash-water quality, sanitation, lot coding). Nutrition-sensitive horticulture (kitchen/market gardens, leafy greens, OFSP, fruit trees) will be tailored to women/youth groups. IPs will engage traders, hotels, institutional buyers, and transporters to fix handling bottlenecks and negotiate price-for-quality incentives.

Indicative OP-I KPIs: area under protected cultivation (ha); % lots meeting defect/temperature targets; post-harvest loss reduction (%); number of MSME cold-chain pilots sustained ≥12 months; women/youth enterprise starts (number); community nutrition proxy gains.

8.4.4 OP-II (2031–2035)

KHCRC will mature into a protected-cultivation and cool-chain solutions provider: greenhouse options, fertigation/soilless modules, IPM toolkits, pack-house layout, sanitation/HACCP templates, and temperature-time protocols. Practices will align with export-grade requirements (traceability, MRL-aware IPM, defect tolerances, labelling). The centre will train service providers (cold-chain operators, pack-house managers) to support clusters of growers.

Indicative OP-II KPIs: number of SMEs certified/approved by buyers; rejection rates (%); average shelf-life gain (days); number of trained operators employed.

Key risks and mitigations (KHCRC): energy/water constraints (solar, water-saving fertigation); pest resistance (IPM rotations, scouting); food-safety lapses (SOPs, audits); affordability (leasing/service models, phased upgrades).

8.5 Teko Livestock Research Centre (TLRC)

8.5.1 Challenges and Constraints

Animal health and vaccines. Endemic diseases (Newcastle in poultry; PPR in small ruminants) constrain productivity; vaccine cold-chain gaps, limited field diagnostics and sparse private veterinary services depress coverage. Reviews emphasize the need for routine immunization with biosecurity and monitoring in smallholder systems (FAO/WOAH, 2023–25; Ouma et al., 2023).

Feeds and food safety. Feed costs and quality volatility (including mycotoxins in local ingredients) undermine margins and flock performance; basic sampling, storage and least-cost formulation capacity are recurrent constraints across West Africa (regional feed/mycotoxin reviews).

Surveillance and One Health. Animal-health surveillance capacity remains weaker than human health; integrated One Health platforms are being built but need resourcing and data flows (FAO, 2024/25; STOP Spillover, 2024).

8.5.2 Strategic Focus

TLRC will focus on poultry, piggery and ruminants with two big levers: feeds (cost-effective, safe formulations using local raw materials) and animal health (vaccination cold-chain, biosecurity, basic diagnostics). The goal will be productivity per unit cost, healthier flocks/herds, and viable MSMEs (hatcheries, feed mills, service vets).

8.5.3 OP-I (2026–2030)

TLRC will validate breed packages (dual-purpose/local-adapted poultry; small-ruminant improvement with simple selection indices) and publish feed formulations tuned to local raw-material profiles and mycotoxin risks, with SOPs for sampling, grinding, mixing, storage. Vaccination/cold-chain upgrades (fridges/freezers, temp logs, outreach calendars) and basic diagnostics (parasitology, bacteriology, necropsy) will support case management and antimicrobial stewardship. Compacts with hatcheries/feed mills will set quality specs and complaint-resolution pathways. Field schools will cover housing, biosecurity, water, and records.

Indicative OP-I KPIs: feed conversion ratio improvements; % poultry flocks vaccinated on schedule; % rations meeting nutrient specs; # hatchery/feed-mill compacts meeting QA; kid/lamb survival rates; # advisory sessions delivered.

8.5.4 OP-II (2031–2035)

TLRC will evolve into a hub for feed-efficiency genetics and forage systems, measuring FCR under controlled but practical conditions and pushing forage banks, pasture renovation, and conserved fodder (hay, silage). A One Health surveillance node will integrate animal health, residues, and environmental signals (with public labs/services). Service packages will include ration formulation clinics, hatchery QA support, and small-ruminant reproduction management.

Indicative OP-II KPIs: number of forage banks established; FCR benchmark improvements; % herds/flocks with documented biosecurity plans; # One Health alerts/investigations; # clients using ration clinics.

Key risks and mitigations (TLRC): feed price shocks (alternative ingredients, least-cost reformulation); cold-chain failures (backup power, alarms); antimicrobial misuse (protocols, training); forage adoption barriers (seed availability, water—mitigate with drought-tolerant options, water-harvesting).

8.6 Freetown Fisheries Research Centre (FFRC)

8.6.1 Challenges and Constraints

The highly mechanized industrial fishery. The fishery of Sierra Leone is broadly classified into three broad categories that include the highly mechanized industrial fishery; the low technology small-scale artisanal fishery; and the under-developed aquaculture and inland fisheries as elaborated below. This sub sector is highly capital intensive and foreign-dominated but constitutes the mainstay for revenue generation from the fishery. During the last 20 years the industrial fishing fleet has consisted mainly of demersal trawlers, shrimpers, canoe support vessels and purse seiners belonging to different nationalities. Transparency is limited, biological reporting is inconsistent, and risks of illegal, unreported and unregulated (IUU) fishing remain high. Weak collaboration between industrial operators and research institutions constrains data collection, stock assessment, and effective monitoring. The relatively large number of licensed purse seiners (for small pelagics) in the 1980s caused spectacular increase in industrial catches (SLARI Strategic Plan 2012-2021). Weak collaboration between industrial operators and research institutions constrains data collection, stock assessment, and effective monitoring.

The low technology small-scale artisanal fishery. The small-scale artisanal fishery is a significant source of employment, rural income and fish protein to vast majority of Sierra Leoneans and is characterized by

diverse fishing gears and crafts. It is a major activity in the coastal districts of Western Area, Port Loko, Kambia, Moyamba, Bonthe and Pujehun. Poor handling practices, rudimentary smoking and drying technologies, and inadequate cold-chain systems contribute to significant post-harvest losses and food-safety risks. Coastal habitats supporting artisanal fisheries, such as mangroves and estuaries, are increasingly degraded by erosion, pollution, and climate change. Hence, potential for increased fish production in this small-scale artisanal fishery exists but this requires major investment in technology, fish handling and processing.

The under-developed aquaculture and inland fisheries. Inland fishery is practiced in ecosystems such as lakes, rivers, floodplains and other water bodies with a total estimated annual production of 16,500 metric tonnes. It is mainly a capture fishery and operates at subsistence level. The use of primitive technology to harvest fish species in rivers and lakes abound. The fishing crafts used are mostly dug-out canoes, which can be about 7 m long. The propulsion is done by poling in shallow water and by paddling in deeper waters.

Surveillance and One Health. Fish-health surveillance capacity remains weaker than human health; integrated One Health platforms are being built but need resourcing and data flows (FAO, 2024/25; STOP Spillover, 2024).

Lack of Standardised Aquaculture Industry Operations in Fish Seed Programs, Smart aquaculture, and Feed Mills: A major constraint in aquaculture is the supply chain for quality seed (fingerlings) and

affordable feed. The industry suffers from a limited, genetically poor broodstock, resulting in slow-growing fingerlings and low productivity. Feed costs are high due to reliance on imports, making farm economics risky and discouraging local feed production. Knowledge gaps and financial limitations hinder adoption of improved practices. Most farmers use traditional, low-yield methods and lack trust in modern approaches due to inaccessible financing, making it too costly to invest in necessary infrastructure, quality inputs, and technology for commercial growth.

Agriculture-aquaculture Models with Rice-fish Co-culture Systems. The fundamental technical limitation is that the two parts have a conflict inherent in managing the resources. Rice farming is known to be periodically drained in the field and the usage of pesticides and herbicides, which are explicitly toxic to fish. The effective introduction of fish requires altered water management to preserve areas of refuge and a transition to integrated pest management which demands a degree of agronomic expertise and day-to-day supervision which most traditional rice farmers have not yet developed. These institutional and economic factors also limit the adoption of these integrated systems.

8.6.2 Strategic Focus

FFRC will work to improve the productivity and sustainability of the main species such as demersal and pelagic fish, shrimp, crab, tilapia, and catfish. FFRC will place strategic emphasis to the development of cost-effective and safe feed based on local materials, vigorous aquatic animal seed production and the establishment of efficient animal health systems to prevent diseases and make diagnostics. These are to enhance greatly the productivity per unit cost, healthier stocks of fish and to develop viable MSMEs in the hatchery, feed mill and veterinary services sectors. Alongside these levers, FFRC will implement a broader research and development framework that aligns with SLARI's mandate and the FEED SALONE agenda. The framework will consist of integrated programmes covering stock assessment, aquaculture innovations, post-harvest systems, and knowledge management.

8.6.3 OP-I (2026–2030)

FFRC will establish the essential infrastructure necessary for applied fisheries and aquaculture research in Sierra Leone. The initial phase emphasizes low-cost, high-impact technologies appropriate for artisanal fisheries, small-scale aquaculture, and community-driven management frameworks. FFRC will strengthen scientific capabilities in stock assessment, fish health, post-harvest handling, and aquaculture inputs, while simultaneously developing a national evidence basis to inform co-management, regulated access, and value-chain development.

Indicative OP-I KPIs: Species assessed with data-limited tools, establishment of national datasets, adoption of improved processing technologies, validated feed formulations, productivity gains in trials, and strengthened co-management sites. Monitor fish disease diagnostics, farmer adoption of best practices, support to youth and women MSMEs, and advancement toward Laboratory accreditation.

8.6.4 OP-II (2031–2035)

FFRC will transition from foundational system-building to implementing advanced fisheries and aquaculture technologies, establishing itself as a national hub for feed-efficiency genetics, ecosystem-based fisheries management, and aquatic One Health surveillance. Conduct practical feed-efficiency and genetic-improvement trials for key species, expand forage and ingredient banks, and operationalize a national hatchery certification system. Scale climate-smart aquaculture models across 20+ community clusters, advance ecosystem-based fisheries management, and integrate One Health surveillance, expand HACCP-based safety systems and develop a harmonized fishery–aquaculture data platform and annual sector report while strengthening national capacity in advanced stock assessment, socioeconomics, ecosystem science, climate-vulnerability analysis.

Indicative OP-II KPIs: Enhancing feed-efficiency and genetics, expanding forage banks, certifying hatcheries, and scaling climate-smart aquaculture clusters. Improvements will be measured via spatial stock-assessment models, EAFM zones, One Health alerts, HACCP fish-safety systems, and KPIs tracking data platform functionality, trained technical staff, and annual fisheries–aquaculture report publication.

Key risks and mitigations (FFRC): weak fisheries and aquaculture data systems, low adoption of improved technologies, inadequate Laboratories, climate vulnerabilities, and limited co-management capacity disease outbreaks, high feed costs, insufficient food-safety monitoring, challenges with digital monitoring tools, funding gaps, and shortages of skilled technical staff, diversified financing, and stronger coordination with national institutions

8.7 Magbosi Land, Water and Environment Research Centre (MLWERC)

8.7.1 Challenges and Constraints

Mechanization and service markets. Power and service bottlenecks constrain the uptake of small mechanization (2-wheel tractors, shellers); weak service ecosystems (spares, finance, operator training) raise downtime and cost per hectare (World Bank, 2024).

Irrigation and IVS. Sierra Leone's effective irrigated area is very small (about 1% of cropped land in Africa generally) and IVS rehabilitation faces design/O&M issues and climate exposure; low-cost kits and water-level management can raise water productivity but need extension and finance (World Bank, 2024).

Drying/storage and quality infrastructure. High ambient RH makes sun-drying slow and risky; improved dryers and hermetic storage cut losses and stabilize quality, but adoption depends on calibration, SOPs and affordable finance (Baidhe et al., 2024; Nath et al., 2024).

***Standards/testing*.** SPS/TBT compliance needs working labs and traceability; SLSB has adopted Codex/ISO/AOAC methods, and ECOWAS/WACOMP is supporting capacity for TBT/SPS systems, but user access and routine testing remain limited (SLSB, 2023; UNIDO/WACOMP, 2024).

8.7.2 Strategic Focus

MLWERC will underpin mechanisation, land and water management, and post-harvest/processing across SLARI - translating climate-smart agronomy into labour- and resource-efficient packages farmers and MSMEs can actually use.

8.7.3 OP-I (2026–2030)

MLWERC will co-create conservation-agriculture toolkits (minimum till, residue retention, cover crops) with small mechanisation (2-wheel tractor attachments, jab planters, shellers). Small-scale irrigation kits (low-head pumps, gravity/drip sets, water-harvesting/levelling guidance) will be validated with cost/benefit and O&M routines. Drying/storage technologies - cribs, solar dryers, low-emission batch dryers, hermetic storage - will be paired with moisture targets and quick-test routines. A soil lab and advisory service (sampling SOPs, fertility recs, lime/organic matter management) will link to LIMS and digital advisory; land-levelling templates and EHS safeguards will be standardised.

Indicative OP-I KPIs: number of service providers trained/certified; hectares under CA; water-productivity gains (%); drying time reduction and moisture/impurity compliance (%); soil-test turnaround (days); % farmers adopting hermetic storage.

8.7.4 OP-II (2031–2035)

MLWERC will become a training and services hub for mechanisation and post-harvest: operator training, service-provider business models (leasing, pay-per-use), dryer calibration, pack-line balancing, and preventive maintenance. It will support partners with method validation/QMS for moisture/grade tests and help MSMEs meet conformity for regional trade (traceability, labelling where applicable).

***Indicative OP-II KPIs*:** number of provider businesses operating 12+ months; machine uptime (%); % lots meeting grade/moisture specs; customer satisfaction (score/5); training-to-job conversion (%).

Key risks and mitigations (MLWERC): equipment downtime (spares, service contracts); affordability (leasing/shared services); water scarcity (harvesting, efficient scheduling); safety incidents (operator training, PPE, SOPs); quality drift (regular calibration, audits).

Chapter 9 - Budget

9.1 Budget Summary

Below is sample indicative budget based on rough estimations just to provide a guide for discussion and finetuning

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ANNEXES

Annex 1. OP-I (2026–2030) Costed Budget — Summary by Outcome

Outcome / Cross-cut	**5-Year Budget (USD)**	**What it Covers (headline)**
Outcome 1: Adoption and Scale	1,490,000	Demo clusters, field days, extension toolkits, digital advisory build and airtime
Outcome 2: Seed System Reliability	1,930,000	EGS rice and legumes, SAH cassava, nursery QA/traceability, seed lab starter, certification support
Outcome 3: Centre Capability	1,650,000	Centre QA/O&M ops funds; small equipment and vehicles bridge
Outcome 4: Knowledge and Laboratories	1,398,000	Priority lab rehab (seed/soil/food safety/quality), LIMS, aflatoxin screening
Outcome 5: Finance and Partnerships	1,800,000	PPP/innovation co-financing window; Commercialization Unit setup and ops
Cross-cut pilots (mech/irrigation/cold chain/storage)	590,000	2-wheel tractors, small irrigation kits, solar/hybrid dryers, hermetic bags, screen/net-houses, pilot cold rooms
MEL (incl. MTR 2029)	1,150,000	Dashboards, adoption/outcome studies, DQAs, mid-term review
OP-I total (programmatic)	**10,008,000**	

Annex 2. Outcome Detail Tables (what staff will actually buy/run): Outcome 1 — Adoption and Scale

Output / Line	**Unit Basis**	**5-Year Cost (USD)**	**Likely Funding Source**
District demo clusters (60/yr; ~4 plots/cluster)	60 × $1,900 × 5 yrs	570,000	Grants + Core
Digital advisory (content, radio/SMS/IVR)	Setup $120k + $60k/yr	360,000	Grants
Extension toolkits and ToTs	$100k/yr	500,000	Grants + Core
Subtotal Outcome 1		**1,490,000**	

Annex 3. Outcome 2 — Seed System Reliability

Output / Line	**Unit Basis**	**5-Year Cost (USD)**	**Likely Funding Source**
Rice EGS production (RARC)	120 ha/yr × ~$1,000/ha × 5 yrs	600,000	Core + Grants
Legume/groundnut/soy EGS (NARC)	80 ha/yr × ~$800/ha × 5 yrs	320,000	Grants
SAH cassava rapid multiplication (NARC)	Setup $10k + OPEX ~$25k/yr	135,000	Grants

Tree-crop nursery QA and traceability (KFTCRC)	Setup $150k + $75k/yr	450,000	Grants
Seed labs starter (ISTA-oriented)	One-off	100,000	Grants
Certification and field inspection support	$50k/yr	250,000	Core + Grants
Subtotal Outcome 2		**1,930,000**	

Annex 4. Outcome 3 — Centre Capability

Output / Line	**Unit Basis**	**5-Year Cost (USD)**	**Likely Funding Source**
Centre QA/O&M ops funds	6 centres × $50k/yr × 5 yrs	1,500,000	Core
Small equipment and vehicles bridge (Y1)	One-off	450,000	Core + Grants
Subtotal Outcome 3		**1,950,000**	

QA=quality assurance, O&M=operations and maintenance, ops=operations

Annex 5. Outcome 4 — Knowledge and Laboratories

Output / Line	**Unit Basis**	**5-Year Cost (USD)**	**Likely Funding Source**
Priority lab rehabilitation (seed/soil/quality/food safety)	Multi-centre bundle (Y1)	1,100,000	Grants
LIMS (onboarding + licenses/O&M)	$58.6k Y1 + $38.6k/yr	211,000	Grants + Commercial
Aflatoxin screening (readers + kits)	$10k Y1 + $15k/yr	87,000	Grants
Subtotal Outcome 4		**1,398,000**	

Annex 6. Outcome 5 — Finance and Partnerships

Output / Line	**Unit Basis**	**5-Year Cost (USD)**	**Likely Funding Source**

Commercialization Unit (HQ)	$150k Y1 + $100k/yr	550,000	Commercial + Core
PPP/innovation co-financing window	$250k/yr	1,250,000	Grants
Subtotal Outcome 5		**1,800,000**	

Annex 7. Cross-Cut Pilots (mechanisation, irrigation, cold chain, storage)

Output / Line	**Unit Basis**	**5-Year Cost (USD)**	**Likely Funding Source**
Two-wheel tractor packages	$60k capex Y1 + $10k/yr O&M	100,000	Grants
Small irrigation kits (gravity/drip/small pumps)	$50k Y1 + $10k/yr O&M	90,000	Grants
Solar/hybrid dryers and hermetic storage	30 dryers + 10,000 bags	120,000	Grants
Solar cold-room pilots (horticulture)	2 units + O&M	110,000	Grants
Screen/net-houses (protected cultivation)	6 units + consumables	130,000	Grants
Subtotal pilots		**590,000**	

Annex 8. MEL (Monitoring, Evaluation and Learning)

Output / Line	**Unit Basis**	**5-Year Cost (USD)**	**Likely Funding Source**
Routine MEL (dashboards, studies, DQAs)	$200k/yr	1,000,000	Grants + Core
Mid-term review (2029)	One-off	150,000	Grants
Subtotal MEL		**1,150,000**	

Annex 9. Year-1 Procurement and Cash-Flow Focus (2026)

Item (Y1)	**Amount (USD)**	**Timing (suggested)**
Priority lab rehabilitation (multi-centre bundle)	1,100,000	Q1–Q2
LIMS onboarding and integration (10 users)	58,600	Q1
SAH cassava unit + Y1 OPEX	35,000	Q1
Seed lab starter kits and moisture meters	100,000	Q1
Screen/net-houses (KHCRC/NARC)	90,000	Q2
Dryers and hermetic storage (multi-centre)	120,000	Q2
Two-wheel tractor packages	60,000	Q2
Digital advisory setup (content + airtime)	120,000	Q1–Q2
Demo clusters (60 @ $1,900)	114,000	Q2–Q3
Certification and field inspection support	50,000	Q3–Q4
Commercialization Unit setup (HQ)	150,000	Q1
PPP/innovation co-financing window	250,000	Q3
MEL routine (dashboards, studies, DQAs)	200,000	Q3–Q4
Devices and field kits (tablets, GPS, sampling)	120,000	Q1
Backup power and UPS upgrades (priority labs)	200,000	Q1–Q2
Year-1 total (programmatic)	**3,651,600**	

Notes: amounts include typical installation/consumables and modest contingency/FX buffers for import-heavy items; replace with vendor quotes at tender.

Annex 10. Centre-Level Envelope (Indicative OP-I Share)

Centre / Unit	5-Year Envelope (USD)	Share of Total
RARC (Rice)	950,000	9.5%
NARC (Roots, tubers and legumes)	850,000	8.5%
KFTCRC (Tree crops)	800,000	8.0%
KHCRC (Horticulture)	1,000,000	10.0%
TLRC (Livestock)	650,000	6.5%
FFRC (Fisheries and Aquaculture)	735,000	7.3%
MLWERC (Land, water and environment)	1,100,000	11.0%
HQ/Shared (labs/LIMS/MEL/PPP window/digital)	4,658,000	46.5%
OP-I total	**10,008,000**	**100%**

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