THE REPUBLIC OF SIERRA LEONE

SIERRA LEONE AGRICULTURAL RESEARCH INSTITUTE

STRATEGIC PLAN
2012 – 2021

NOVEMBER, 2011

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ABBREVIATIONS AND ACRONYMS

AARINENA	Association of Agricultural Research Institutes in the Near East and North Africa.
AIS	Agricultural Innovation Systems.
APVC	Agricultural Product Value Chain.
AU	African Union.
CAADP	Comprehensive African Agricultural Development Programme.
CORAF	West and Central Africa Council for Agriculture Research and Development.
ECOWAP	ECOWAS Common Agricultural Policy.
ECOWAS	Economic Community of West African States.
FAAP	Framework for African Agricultural Productivity.
FARA	Forum for Agricultural Research in Africa.
FFRC	Freetown Fisheries Research Centre.
FSA	Farming Systems Approach.
GDP	Gross Domestic Product.
GoSL	Government of Sierra Leone.
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune-deficiency Syndrome.
IAR4D	Integrated Agricultural Research for Development.
ICT	Information Communication Technology.
IP	Innovation Platform.
KFTCRC	Kenema Forestry and Tree Crops Research Centre.
KHCRC	Kabala Horticultural Crops Research Centre.
MAFFS	Ministry of Agriculture, Forestry and Food Security.
MDGs	Millennium Development Goals.
MLWRC	Magbosi Land and Water Research Centre.
NACU	National Agricultural Coordination Committee.
NARC	Njala Agricultural Research Centre.
NARCC	National Agricultural Research Coordinating Council.
NEPAD	New Partnership for Africa's Development.
NGO	Non-Governmental Organization.
NSADP	National Sustainable Agriculture Development Programme.
PRSP	Poverty Reduction Strategy Paper.
RARC	Rokupr Agricultural Research Centre.
SLARI	Sierra Leone Agricultural Research Institute.
TLRC	Teko Livestock Research Centre.
WECARD	West and Central African Council for Agricultural Research and Development.

FOREWORD

Since the current Government of Sierra Leone took office in 2007, we have strived to chart a bold new path for accelerating the advancement of our country on all fronts. Agriculture is now given number one priority in H.E. the President of Sierra Leone "Agenda for Change", because the agricultural sector plays a major role in the economic development of Sierra Leone and is the source of livelihood for a high proportion of the population actively involved in agricultural-based activities. The performance of agriculture impacts heavily on nearly all other sectors of development and is, therefore, the mainstay of the national economy by providing the basis for the development of the other sectors. By contributing raw materials to the manufacturing/ industrial sector, the agricultural sector has a definite role in Sierra Leone's progress towards becoming a food secure and newly industrialized country. For the agricultural sector to improve on its contribution to the overall goal of national economic growth, wealth creation, food security and poverty alleviation, the sector must be transformed from subsistence to a commercial and profitable business enterprise.

The country's Second Poverty Reduction Strategy Paper: "The Agenda for Change" that was developed to deliver the economic growth envisioned in the Vision 2025 presents a comprehensive medium-term development strategy that focuses on four strategic priorities that include (i) enhancing the national power supply; (ii) increasing agricultural productivity and competitiveness; (iii) significantly improving the national transportation network; and (iv) promoting sustainable human development through decentralized service delivery. These priorities are underpinned by good governance, macroeconomic stability, private sector development, financial sector reform and natural resource management. The agenda refers to agriculture as the engine for economic growth with a focus on the agricultural value chains of input supply, production, value addition/agro-processing and marketing. The agenda recognises that from a pro-poor perspective, raising the quality and value-added productivity in agriculture in general is critical to poverty reduction as majority of the population are engaged in agriculture.

In this regard, the objectives set out by the agricultural sector to achieve the Vision of the agenda for change as spelled out in the National Sustainable Agriculture Development Plan (NSADP) include (i) increasing agricultural productivity through a variety of support measures along the entire agricultural value chain; (ii) promoting commercial agriculture through private sector participation; (iii) improving agricultural research and extension delivery systems; (iv) promoting efficient and effective sector resource management systems; (v) managing and exploiting country's fishery and marine resources and accessing local and international markets; (vi) managing and exploiting country's forestry resources to mitigate against climate change; and (vii) mainstream cross-cutting issues in agriculture. Out of this Plan, the government flagship program, Smallholder Commercialization Program (SCP), was drawn for the medium term.

The vision for the NSADP and SCP of commercializing agriculture, especially through linking of farmers to markets, emphasizes the critical role agricultural research and extension is expected to play in the development of the agricultural sector. In this regard the, Sierra Leone Agricultural Research Institute (SLARI) is expected to play a major role in addressing the many challenges facing the agriculture, fishery and forestry sub sectors. As the national agricultural research institution, SLARI is expected to conduct research to generate and disseminate knowledge, information and technologies needed for sustainable development of the country's agricultural sector.

Taking cognizance of the developments taking place at the national, regional and international levels, SLARI has developed this Strategic Plan for the period 2012-2021. The Strategic Plan is tailored to strategically position SLARI to contribute significantly to the development of the agricultural sector. From the regional and global perspective, the Strategic Plan is in line with the Comprehensive African Agricultural Development Programme (CAADP); West and Central African Council for Agricultural Research and Development (WECARD); and the Millennium Development Goals (MDGs).

In order to position itself strategically as a key driver in the transformation of the agricultural sector from subsistence to a commercial and profitable business enterprise, SLARI has adopted the Agricultural Product Value Chain (APVC) approach to research for development within the framework of Integrated Agricultural Research for Development (IAR4D). The adoption of this approach to research requires SLARI to shift focus from production of commodities to differentiated agricultural products including increased value-addition to commodities within the rural areas and development and promotion of new products that fit the demands of the target market.

The adoption of the APVC approach to research for development has been necessitated by the renewed focus on agriculture and agribusiness as priority sectors for spurring economic growth in Africa with calls for development of APVCs that integrate producers and markets to make the agricultural sector more responsive to consumer demands. An important feature of the APVC approach is that it permits analysis of the whole product system leading to the identification and prioritization of opportunities and problems throughout the system which facilitates the development of more realistic and focussed research and development intervention projects.

This new Strategic Plan has been developed within the context of the on-going national institutional and policy reforms, taking into consideration the country's new political system and structure of government as well as the available and emerging opportunities. The Strategic Plan has also taken into account the achievements and lessons learnt during the implementation of the previous guiding policies and plans of the government. In aligning itself to the guiding policies and plans at the national, regional and global levels, SLARI has formulated an inspiring Vision to see "Improved and sustainable broad-based agricultural growth". The Mission statement that expresses the fundamental purpose and business of SLARI is "To enhance sustainable productivity, commercialization

and competitiveness of the agricultural sector through generation and promotion of innovative agricultural technologies and empowerment of stakeholders".

The development of this new Strategic Plan has been a consultative process involving key stakeholders within and outside SLARI. This was done so as to ensure that it incorporates all constructive views and suggestions from all key stakeholders; builds on the current SLARI achievements and strengths and contributes significantly to the development of the agricultural sector and the country while ensuring proper alignment at the national and regional levels. In this regards, I would like to thank most sincerely the Executive Director of Forum for Agricultural Research in Africa, Prof. Monty P. Jones; the Director of Kenya Agricultural Research Institute, Dr. E.A. Mukisira; and the Director General of AfricaRice Centre, Dr. Papa Abdoulaye Seck for facilitating the formation and support of the team of experts that spearheaded the preparation of this Strategic Plan. I, in particular, wish to thank Dr. Antony M. Kilewe for providing excellent leadership to the team of experts as well as providing technical guidance to the SLARI management and for putting together the final strategic plan.

Lastly but not least, I wish to thank the SLARI Director General, Dr A. Dixon; former Chairman of SLARI Council, Dr. D.S.C. Spencer and current Chairman of SLARI Council, Prof. Edward R. Rhodes; and Dr. Adewale Adekunle of FARA for providing overall guidance and coordination of the planning process. The contribution of all other individuals or groups that assisted in one way or another towards the development of this Strategic Plan is greatly acknowledged.

Joseph Sam Sesay, PhD. Development Economics & Doctorate in Public Administration
Minister of Agriculture, Forestry and Food Security

PREFACE

Sierra Leone has had a long history of agricultural research spanning almost 100 years. The West Africa Institute for Oil palm Research (WAIFOR) at Njala, the Bambawo Forestry Research Station near Kenema and the Rice Research Station at Rokupr were pioneer research centres in West Africa during the colonial era. In the mid eighties, the National Agricultural Research Coordinating Council (NARCC) was established by the government of Sierra Leone to coordinate research and harmonize activities of the two existing research institutions (Rice Research Institute and the Institute of Agricultural Research).

Agricultural research in Sierra Leone has made significant contributions towards improving productivity in the past through the development of improved crop varieties particularly rice, cassava and sweet potato coupled with key management practices. Agricultural research has played a major role in the development of these technologies and has made significant contributions to rural development in the past. The impact indicators of the long-term investments in agricultural research may be grouped into three categories that include (i) the productivity impact that focuses on the efficient use of resources; (ii) the livelihood impact which determines whether gains of increased productivity benefit the mass of society; and (iii) the environmental impact which determines whether the gains achieved by the first two impact indicators can be sustained.

The Sierra Leone Agricultural Research Institute (SLARI) was established by an Act of parliament in 2007 as a semi autonomous government agency, as part of the continuing efforts to revive agricultural research. In order to align its activities to the government focus on food security, poverty reduction, employment creation and commercialization of the agricultural sector, SLARI has developed this new Strategic Plan covering the period 2012-2021. The Strategic Plan explores a new paradigm of agriculture as a commercial business where farmers will move from subsistence to earning a decent livelihood from their farming enterprises.

Given the institutional strategic direction, SLARI has identified five result areas that are necessary and sufficient to deliver on the institute's specific objective of generating and promoting innovative agricultural technologies and empowerment stakeholders. Attainment of this specific objective will contribute significantly to the realization of the overall Institute's general objective of enhancing sustainable productivity, commercialization and competitiveness of the agricultural sector.

The five results that are designed to position SLARI strategically as the key driver for enhancing productivity, commercialization and competitiveness of the agricultural sector include (i) Appropriate agricultural product value chains technologies and innovations generated and promoted; (ii) Appropriate markets and marketing strategies for enhancing agricultural product value chains developed and promoted; (iii) Appropriate policy options for enhancing agricultural product value chains facilitated and advocated; (iv) Capacity for implementing agricultural product value chains research strengthened;

and (v) Appropriate mechanisms for managing, sharing and up scaling agricultural knowledge, information and technologies established and operationalized.

This strategic Plan emphasises the need for SLARI, as a national research organization, to work with partners, collaborators, the farming community and other players along the various agricultural product value chains so as to have a vibrant commercially-oriented and competitive agricultural sector. To be responsive to client demands, and eventually deliver development objectives, there is greater need of true partnerships among key stakeholders within the agricultural sector. This Strategic Plan, therefore, provides a framework and a roadmap for SLARI's research programmes for the next ten years. As a framework, the Strategic Plan provides the guiding principles and basis on which a detailed five year operational plan that is required to operationalize it shall be developed.

The Strategic Plan is the outcome of several months of continuous learning, communication and negotiation by the Institute and stakeholders, with the primary objective of building consensus around the Institute's strategic areas. In this regard, I wish to thank the Honourable Minister of Agriculture, Forestry and Food Security through whose initiative and effort a collaborative partnership with Kenya Agricultural Research Institute and Africa Rice Centre and Forum for Agricultural Research in Africa was established to assist SLARI in the development of this new Strategic Plan. In view of this, I would like to thank most sincerely the team of experts from the KARI, Africa Rice Centre and FARA under the leadership of Dr. Antony M. Kilewe who spearheaded the preparation of this Strategic Plan. I appreciate the efforts and hard work of the SLARI Director General, Dr A. Dixon and all the SLARI staff and stakeholders who were involved in one way or another in the preparation of this document. It is my hope that all our stakeholders will find the document pragmatic and adequately reflective of their needs from the point of view of agricultural research for development.

Prof. Edward R. Rhodes,
Chairman, SLARI Council

ACKNOWLEDGEMENT

Agricultural research in Sierra Leone has made significant contributions towards improvement of the agricultural production and rural development in the past. In order to strengthen the role of agricultural research, the Government established the Sierra Leone Agricultural Research Institute (SLARI) through an Act of Parliament as the country's agricultural research and agricultural technology generating body for the benefit of the farming, fishing and forestry sectors. The SLARI Act embodies government's recognition of the potential role of agricultural research in contributing towards national food security, poverty alleviation and the need for providing the necessary framework that will provide the enabling environment for agricultural research to contribute towards making agriculture the engine for national economic growth. When fully operational, SLARI shall be composed of seven research centres spread throughout the country. The Centres include (i) Njala Agricultural Research Centre; (ii) Rokupr Agricultural Research Centre; (iii) Kabala Horticultural Crops Research Centre; (iv) Teko Livestock Research Centre; (v) Freetown Fisheries Research Centre; (vi) Kenema Forestry and Tree Crops Research Centre; and (vii) Magbosi Land and Water Research Centre.

SLARI is mandated to implement the agricultural policies and strategies of the Government of Sierra Leone (GoSL). In addition to being one of the few national research programmes in Africa with a comprehensive Strategic Plan, a unique feature of the SLARI Strategic Plan is its alignment with those of the regional and continental agricultural research coordinating bodies, namely, the West and Central African Council for Agricultural Research and Development (CORAF/WECARD) and Forum for Agricultural Research in Africa (FARA), respectively; as well as the Comprehensive African Agricultural Development Plan (CAADP) of the African Union's (AU) New Partnership for Africa's Development (NEPAD). In view of this, the SLARI Vision and Mission statements confirm the Institute's commitment to the national, regional and global policies and priorities aimed at creating economic development through agriculture and meeting the Millennium Development Goals of reducing poverty and eradicating hunger. Despite being a young organization in its formative stage, SLARI has kept pace with the increasing demands and has been instrumental and proactive in providing scientific solutions for agricultural development. However, more than ever before, the institute is now required to go beyond research and become a vehicle for development. It is, therefore, imperative that SLARI plans diligently and carefully so that its programmes and activities respond to real, current and future needs of the government and more particularly, the farming community and other stakeholders in the agricultural sector.

In order to deliver on the five institutional level results outlined in the new Strategic Plan, SLARI has adopted a programme approach to its research planning and management. In view of this and considering the need to ensure effective delivery of the five institutional level results, research operations in SLARI have been rationalized into seven long-term strategic research programme areas of focus. The research programme areas of focus express a stronger organizational commitment to impact on the strategic

orientation and positioning of SLARI as a leader in the generation and promotion of innovative agricultural technologies and stakeholders empowerment aimed at increasing productivity, commercialization and competitiveness of the agricultural sector. The necessary and sufficient research programme areas of focus include Root, Tuber and Grain Legume Crops Programme; Cereal Crops Programme; Horticultural Crops Programme; Livestock Programme; Fisheries Programme, Forestry and Tree Crops Programme; and Land, Water and Environment Programme.

The implementation of the Strategic Plan shall be underpinned by an integrated and holistic approach based on a research framework carried out through priority thrusts and associated interventions for addressing priority product value chain problems. The implementation of the Strategic Plan will further incorporate joint planning and participation by all key stakeholders so as to ensure that multiple views, needs and concerns in resolving priority product value chains issues at different levels are taken into account and negotiated. The Strategic Plan programme areas of focus shall be addressed through nationally coordinated PVC-based projects. Cross centres and organizational synthesis, networking and sharing of lessons learned shall be used to improve the value of the research findings.

The preparation of the new SLARI Strategic Plan has been a highly participatory process involving many internal and external stakeholders with the primary objective of building consensus around the Institute's strategic areas. This document would not have been a reality without the active participation and commitment of many institutions and individuals. In this regard, I wish to express our sincere appreciation and gratitude to:

- The Honourable Minister of Agriculture, Forestry and Food Security, Dr. Joseph Sam Sesay for his continuous engagement, guidance, advice and encouragement that contributed enormously to the overall success of this SLARI planning process.
- The Executive Director of Forum for Agricultural Research in Africa, Prof. Monty Jones; the Director of Kenya Agricultural Research Institute, Dr. E.A. Mukisira; and the Director General of Africa Rice Centre, Dr Papa Abdoulaye Seck for facilitating the formation and support of the team of experts that spearheaded the preparation of this Strategic Plan.
- The former Chairman, Dr. D.S.C. Spencer, and the current Chairman of SLARI Council, Prof. Edward R. Rhodes and other council members for their continuous engagement and keen interest in the SLARI planning process.
- Dr. Antony M. Kilewe for providing excellent leadership to the team of experts as well as providing technical guidance to the SLARI management and for putting together the final strategic plan
- The members of the team of experts that spearheaded the preparation of this Strategic Plan that included Dr. Joseph G. Mureithi, Dr. Foustin P. Wandera, Dr. Lusike Wasilwa, Dr. Anthony O. Esilaba, and Ms. Violet O. Kirigua from Kenya Agricultural Research Institute; Prof. Adewale Adekunle, Dr. Solomon Bangali and Dr. Nelson Ojijo from Forum for Agricultural Research in Africa; and Dr. Moussa Sie from Africa Rice Centre.

- The SLARI senior managers, centre directors, research scientists and other key stakeholders for their dedication and commitment throughout the planning process and for making excellent arrangements and logistical support.
- All other individuals or groups that assisted in one way or another towards the success of the planning process.

Dr Alfred G.O. Dixon,
SLARI Director General

EXECUTIVE SUMMARY

1.0 Introduction

1.1 Agriculture is the engine of the Sierra Leone's economy and its performance impacts heavily on nearly all other sectors. It is the mainstay of the national economy and provides the basis for the development of the other sectors. By contributing raw materials to the manufacturing/industrial sector, the agricultural sector has a definite role in Sierra Leone's progress towards becoming a food secure and newly industrialized country. For the agricultural sector to improve on its contribution to the overall goal of national economic growth, wealth creation, food security and poverty alleviation, the agricultural sector must be transformed from subsistence to a commercial and profitable business enterprise.

1.2 Agricultural research in Sierra Leone has made significant contributions towards improvement of the agricultural production and rural development in the past. In order to strengthen the role of agricultural research, the Government established the Sierra Leone Agricultural Research Institute (SLARI) through an Act of Parliament as the country's agricultural research and agricultural technology generating body for the benefit of the farming, fishing and forestry sectors. When fully operational, SLARI shall be composed of seven research centres spread throughout the country. The Centres include (i) Njala Agricultural Research Centre; (ii) Rokupr Agricultural Research Centre; (iii) Kabala Horticultural Crops Research Centre; (iv) Teko Livestock Research Centre; (v) Freetown Fisheries Research Centre; (vi) Kenema Forestry and Tree Crops Research Centre; and (vii) Magbosi Land and Water Research Centre.

1.3 Taking cognizance of the developments taking place at the national, regional and international levels, SLARI has developed this Strategic Plan for the period 2012-2021. The Strategic Plan is tailored to strategically position SLARI to contribute significantly to the development of the agricultural sector. From the regional and global perspective, the Strategic Plan is in line with the Comprehensive African Agricultural Development Programme (CAADP); West and Central African Council for Agricultural Research and Development (CORAF/WECARD); and the Millennium Development Goals (MDGs).

2.0 Strategy for Responding to the Agricultural Sector Development Challenges

2.1 In order to position itself strategically as a key driver in the transformation of the agricultural sector from subsistence to a commercial and profitable business enterprise, SLARI has adopted the Agricultural Product Value Chain (APVC) approach to research for development within the framework of Integrated Agricultural Research for Development (IAR4D). The adoption of this approach to research requires SLARI to shift focus from production of commodities to differentiated agricultural products including increased value-addition to commodities within the rural areas and development and promotion of new products that fit the demands of the target market.

2.2 The adoption of the APVC approach to research for development has been necessitated by the renewed focus on agriculture and agribusiness as priority sectors for spurring economic growth in Africa with calls for development of APVCs that integrate producers and markets to make the agricultural sector more responsive to consumer demands. An important feature of the APVC approach is that it permits analysis of the whole product system leading to the identification and prioritization of opportunities and problems throughout the system which facilitates the development of more realistic research and development intervention projects.

2.3 In addition to this, the APVC approach to research for development implies expansion of the research portfolio to components such as post-harvest processing, marketing and internalization of consumer needs. The approach involves working with all players along the different APVCs from resources, production, processing, marketing to consumption. The APVC approach is characterized by increased vertical coordination of many actors and would be expected to demand for more integration and coordination of all different service providers around priority APVCs.

3.0 Institutional Strategic Direction

3.1 SLARI is mandated to implement the agricultural policies and strategies of the Government of Sierra Leone (GoSL). It is also supposed to spearhead the implementation of CAADP Pillar IV in Sierra Leone. In view of this, the SLARI Vision and Mission statements confirm the Institute's commitment to the national, sub regional and regional policy and priorities aimed at creating economic development through agriculture and meet the Millennium Development Goals of reducing poverty and eradicating hunger.

3.2 The SLARI guiding Vision that requires the Institute and its stakeholders and partners to stretch their future expectations, aspirations and performance is to see "**Improved and sustainable broad-based agricultural growth".** The Mission statement that expresses the fundamental purpose and business of SLARI is **"To enhance sustainable productivity, commercialization and competitiveness of the agricultural sector through generation and promotion of innovative agricultural technologies and empowerment of stakeholders"**.

3.3 Decisions and actions in SLARI are consistently based on a set of clear principles outlined as the institutional Guiding Core Values. 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 (i) Scientific excellence, innovativeness and ethics; (ii) Impact, performance and service orientation; (iii) Partnerships for collaborative advantage and synergies; (iv) Respect for staff, clients and stakeholders and partners diversity; and (v) Integrity, transparency, accountability and cost-effectiveness.

4.0 Institutional Level Results

4.1 Given the institutional strategic direction, SLARI has identified five result areas that are necessary and sufficient to deliver on the institutional specific objective of **generating and promoting innovative agricultural technologies and empowerment stakeholders**. Attainment of this Specific Objective will contribute significantly to the realization of the overall Institute's General Objective of **enhancing sustainable productivity, commercialization and competitiveness of the agricultural sector**.

4.2 The five results that are designed to position SLARI strategically as the key driver for enhancing productivity, commercialization and competitiveness of the agricultural sector are as shown in the table below.

Results	Statement
Result 1	Appropriate agricultural product value chains technologies and innovations **generated and promoted.**
Result 2	Appropriate markets and marketing strategies for enhancing agricultural product value chains **developed and promoted.**
Result 3	Appropriate policy options for enhancing agricultural product value chains **facilitated and advocated.**
Result 4	Capacity for implementing agricultural product value chains research **strengthened.**
Result 5	Appropriate mechanisms for managing, sharing and up scaling agricultural knowledge, information and technologies **established and operationalized.**

5.0 Strategic Research Areas of Focus

5.1 In order to deliver on the five institutional level results, SLARI has adopted a programme approach to its research planning and management. In view of this and considering the need to ensure effective delivery of the five institutional level results, research operations in SLARI have been rationalized into seven long-term strategic research programme areas of focus. The research programme areas of focus express a stronger organizational commitment to impact as the strategic orientation and positioning of SLARI as a leader in the generation and promotion of innovative agricultural technologies and stakeholders empowerment aimed at increasing productivity, commercialization and competitiveness of the agricultural sector.

5.2 Each of the research programme areas of focus shall be expected to contribute to the attainment of the five institutional level results. To do this in the most effective and efficient manner, each of the research programme areas of focus shall be expected to deliver on five results similar to those at the institutional level but reduced in scale and scope to the specific research programme area of interest for better outcome mapping and impact orientation.

5.3 The necessary and sufficient research programme areas of focus required to deliver the institutional level results leading to increasing productivity, commercialization and competitiveness of the agricultural sector include Root, Tuber and Grain Legume Crops Programme; Cereal Crops Programme; Horticultural Crops Programme; Livestock Programme; Fisheries Programme, Forestry and Tree Crops Programme; Land, Water and Environment Programme.

6.0 Research Support Functions

6.1 Successful implementation of the seven strategic research programme areas of focus will depend largely on the availability, effectiveness and efficiency of the institutional research support functions. In order to ensure effective upgrading and promotion of priority Agricultural Product Value Chains under each of the research programme, SLARI will need to strengthen its institutional capacities and competences. The required capacities and competences will emanate from within SLARI and her collaborating partners and shall focus on the human, financial and physical resources and the institutional arrangements that will be required to adequately address the issues highlighted under the strategic research programme areas of focus.

6.2 In order to contribute significantly to the attainment of the overall institutional purpose, the research support functions in SLARI shall be structured into six key functions. Like the research programme areas of focus, the research support functions shall be expected to contribute to the attainment of the overall institutional purpose.

To do this in the most effective and efficient manner, the research support functions areas of intervention shall be expected to deliver on five results similar to those at the institutional level but reduced in scale and scope for better outcome mapping and impact orientation. The key research support functions include the following:

(i) Human Resource Development and Management.
(ii) Financial Resource Acquisition and Management.
(iii) Physical Resource Development and Management.
(iv) Procurement and Supplies Services.
(v) Information Communication and Documentation.
(vi) Institutional Corporate Governance.

7.0 Strategic Plan Implementation Arrangements

7.1 The implementation of the Strategic Plan shall be underpinned by an integrated and holistic approach based on a research framework carried out through priority thrusts and associated interventions for addressing priority product value chain problems. The implementation of the Strategic Plan will further incorporate joint planning and participation by all key stakeholders so as to ensure that multiple views, needs and concerns in resolving priority product value chains issues at different levels are taken into account and negotiated. The Strategic Plan programme areas of focus shall be addressed through nationally coordinated PVC-based projects. Cross centres and organizational synthesis, networking and sharing of lessons learned shall be used to improve the value of the research findings.

7.2 The Sierra Leone Agricultural Research Institute recognizes the significant role of each stakeholder and industry player in Integrated Agricultural Research for Development. In view of this, SLARI will adopt a strong collaborative and partnership approach to the development and promotion of Agricultural Product Value Chains. Every step of technology development and dissemination will be undertaken in collaboration with stakeholders. Necessary structures and frameworks will be established to facilitate effective collaborative engagement with both internal and external collaborators and partners that include relevant Government Ministries and Departments, universities, international research organizations, non-governmental organizations, the private sector and development agencies for effective delivery of its services.

7.3 As a public-funded corporate entity, SLARI shall embrace performance contracting as a way of organizing and defining its results, responsibilities and tasks to ensure their systematic and purposeful accomplishment. Consequently, the broad intervention strategies described in this Strategic Plan will be broken down into specific activities which will form the basis for negotiated and agreed upon annual performance targets with the Government. Each year's targets will be expected to build upon the previous accomplishments and lead systematically to the realization of the Institute's Mission. These performance targets shall be cascaded to all management levels of the Institute and shall, in essence, form the basis of the Institute's annual staff appraisal system.

7.4 This Strategic Plan has outlined clear strategic results and research programme areas of focus as well as research support functions that can only be realized through sound implementation plans. To operationalize and finance the Strategic Plan, therefore, the Institute shall develop two detailed Operational and Investment Plans covering the periods 2012-2016 and 2017-2021. In developing the Operational and Investment Plan, the Institute shall engage its staff in formulating intervention strategies that are necessary and sufficient for delivering the institutional strategic results, Mission and Vision. The first Operational and Investment Plan shall put emphasis in the reconstruction to resurrect SLARI by putting in place the required human resources, infrastructure and equipment and related facilities require for the conduct of research.

7.5 The Operational and Investment Plan shall, in turn, be operationalized and financed through Rolling Annual Work Plans in which the necessary and sufficient activities and their respective milestones required to deliver each yearly target shall be specified. The rolling annual work plans will be linked to the annual Performance Contract (PC) targets. The adoption of the rolling annual work plans shall be expected to facilitate the review of the research agenda in close consultation with the relevant key stakeholders and their adjustment in the context of emerging priorities and funding opportunities.

7.6 Monitoring and evaluation (M&E) is an integral part of performance management. The purpose of M&E is to evaluate the progress of planned activities with a view to ensuring that their implementation is proceeding according to plan and the set targets are being met. In order to institutionalize the monitoring and evaluation process, SLARI shall develop and operationalize a suitable monitoring and evaluation system/ mechanisms capable of tracking the implementation of the approved Product Value Chain based projects and activities. The monitoring and evaluation system shall include the use of logical frameworks, work plans, field visits, quarterly and annual reports, mid-term internal evaluation, biannual conferences and end of term external evaluation.

1.0 BACKGROUND

1.1 Introduction

Agriculture is the mainstay of Sierra Leone's economy, contributing about 46% of the Gross Domestic Product (GDP) and providing employment for about 75% of the population with women as the predominant labour force. The sector sustains about two-thirds of the population who are mainly subsistence farmers. Besides agriculture, the other important sector is mining. The important sectors have, however, been declining over the last two decades. Crop production the main sub-sector, contributes about three-quarters of agricultural value added, with rice holding the dominant position. Agriculture also accounts for over 90% of the domestic energy for heating and cooking through the supply of fuel wood.

Since independence, the economy of Sierra Leone has gone through bouts of positive and negative growth rates. Many factors have contributed to this performance but the most significant is the war that ravaged the economy in the 1990s that led to a contraction in the growth rate to 4% per annum. During this period, per capita income plummeted by 47%, leading to exacerbation of poverty, especially in the rural areas. However, in 2001 after the cessation of hostilities, there has been tremendous growth in the economy. The GDP rose from 5.4% in 2001 to 7.5% in 2007, and currently stands at 6.5% per annum.

1.2 Role and Evolution of Agricultural Research in Sierra Leone

1.2.1 Role of Research in Agricultural Development

Agricultural research in Sierra Leone has made significant contributions to rural development in the past. The impact indicators of the long-term investments in agricultural research may be grouped into three categories that include (i) the productivity impact that focuses on the efficient use of resources; (ii) the livelihood impact which determines whether gains of increased productivity benefit the mass of society; and (iii) the environmental impact which determines whether the gains achieved by the first two impact indicators can be sustained.

Agricultural research in Sierra Leone has made significant contributions towards improving productivity in the past through the development of improved crop varieties particularly rice, cassava and sweet potato coupled with key management practices. There is currently a growing drive towards increased investments in agriculture and improving agricultural production through intensification of production by means of irrigation. Food diversification and the holistic value chain approach is a key strategy aimed at opening realistic avenues for employment particularly to the youth and improving the food situation and welfare of all Sierra Leoneans.

1.2.2 Evolution of Agricultural Research

Sierra Leone has had a long history of agricultural research, spanning almost 100 years. Agronomic research was done at the Njala Experiment Station, Southern Province, which was opened in 1910. The Rice Research Station which was established at Rokupr, Northern Province in 1934 was devoted to research on mangrove and swamp rice and in 1953 was transformed into the West African Rice Research Institute. A veterinary station was set up at Teko, Makeni in 1942, and a livestock station at Musaia, Kabala in 1943, both in Northern Province. In 1953, the oil palm research programme at Njala became the West African Institute for Oil Palm Research. From 1953, forestry research was carried out at the Forestry Research Station at Bambawo in Eastern Province, and high yielding Amazonian cocoa planting materials were propagated and distributed from Kpuwabu. From 1953, fisheries research was conducted at the West African Fisheries Research Institute at Kissy near Freetown.

In 1985, the National Agricultural Research Coordinating Council (NARCC) was established to coordinate research and harmonize research activities. The mission of NARCC was to support the promotion of pro-poor sustainable growth for food security and job creation as part of Sierra Leone's Poverty Reduction Strategy Paper. Its mandate was confined to annual crops. The two constituent institutes of NARCC were the Rice Research Institute dealing with rice, millet, sorghum, banana, plantain and vegetables, and the Institute of Agricultural Research dealing with cassava, sweet potato, yam, maize, cowpea, groundnut, soybean and sesame. The earlier research institutes became defunct. In addition to the research institutes, Njala University and the University of Sierra Leone also carry out agricultural research. The devastation of research infrastructure during the war and the departure of well-trained scientists during this period brought agricultural research to a halt. Since 2001, many of the scientists have returned and there is goodwill from the Government and partners to resuscitate the research establishment.

1.3 Sierra Leone Agricultural Research Institute

After a period of coordination of agricultural research under NARCC, the Government of Sierra Leone (GoSL) established the Sierra Leone Agricultural Research Institute (SLARI) through the SLARI Act of Parliament of 2007. SLARI is now the agricultural research and agricultural technology generating body for the benefit of the farming, fishing and forestry sectors and to provide for other related matters. When fully

operational, SLARI will be expected to have the following seven research centres whose locations are shown in Annex 5:

- Njala Agricultural Research Centre (NARC).
- Rokupr Agricultural Research Centre (RARC).
- Kabala Horticultural Crops Research Centre (KHCRC).
- Teko Livestock Research Centre (TLRC).
- Freetown Fisheries Research Centre (FFRC).
- Kenema Forestry and Tree Crops Research Centre (KFTCRC).
- Magbosi Land and Water Research Centre (MLWRC).

1.3.1 SLARI's Mandate and Core Functions

SLARI has a major role to play in addressing the many challenges facing the agriculture, fishery and forestry sub sectors in the country. As the national agricultural research institution, it is expected to conduct research to obtain knowledge, information and technologies needed for sustainable development of the country's agricultural sector. The core functions of SLARI are defined in the SLARI Act of 2007. These provide SLARI and its research centres with a clear framework for delivering on its mandate. The core functions include:

(a) Provide information that will assist the Government and other stakeholders in the development of agricultural policies for poverty alleviation, food security and improved livelihoods of the citizens of Sierra Leone.

(b) Formulate agricultural research policies and programmes taking into account the vision, mission, goals and objectives of the agricultural sector, in line with government policy, and views of stakeholders, especially those which relate to sustainable food security, and conservation of renewable resources of Sierra Leone.

(c) Conduct food and cash crops production, livestock production and health, fish production, land and water management, forestry production and conservation, food and nutrition, technology and socioeconomics of post-harvest activities, emerging technologies in agricultural science biosafety and environmental conservation.

(d) Establishment of strong working relationship with extension agents in the public and private sectors in the transfer of technology.

(e) Maintain a register of research scientists, research projects and research results.

(f) Facilitate and provide the relevant training and manpower development to serve the agricultural needs of the country.

(g) Produce annual reports highlighting management, scientific training and financial aspects of the Institute.

(h) Establish strong links with national, regional and international agricultural research institutions or agencies involved in science and technology development and transfer.

(i) Representing the country in regional and international fora.

(j) Enhance public awareness on importance of scientific research to agricultural and economic development.

(k) Disseminate knowledge on improved technologies to stakeholders.

(l) Monitor and evaluate adoption and impact of agricultural research on agricultural productivity.

(m) Process and forward to government annual estimates for funding.

(n) Mobilize human, financial and capital resources from donors, private sector and from within the Institute for the benefit of SLARI.

1.4 The Need for a New Strategic Plan

SLARI is a young organization in its formative stage and has, therefore, a very weak capacity for fulfilling its research mandate. The current level of human, physical and financial resources available to the institution is inadequate for cutting-edge research. Despite these limitations, the Institute recognizes that technology and information must play a vital role in the revitalization of the agricultural sector if Sierra Leone is to attain self-sufficiency in food and raw materials production and become competitive in the region.

SLARI formulated its first Strategic Plan covering the period 2008-2017 in 2008. The Vision for this first Strategic Plan was "Increasing food security and wealth by contributing to sustainable agricultural growth and an effective agricultural research system" while the Mission was "Supporting agricultural growth through increasing productivity by the generation and promotion of innovative technology and the empowerment of stakeholders". The Strategic Plan expected to deliver on five results that included (i) Appropriate technologies/innovations generated and promoted; (ii) Appropriate policy recommendations developed and promoted; (iii) National capacity for research and technology development strengthened; (iv) Collaboration and coordination between stakeholders strengthened; and (v) Knowledge/information management systems established and operationalized.

Although the period for this Strategic Plan was not yet over, major changes have occurred in the operating and policy environments nationally, regionally and globally as well as advances in science and technology that have necessitated the revision of the first Strategic Plan so as to ensure proper alignment. One of the key changes is the development and launch of the National Sustainable Agriculture Development Plan/

Comprehensive Africa Agriculture Development Programme (NSADP/CAADP) which provides the broad framework for putting the objectives of the Government's Agenda for Change outlined in the Second Poverty Reduction Strategy Paper (PRSP-II) into action. The Vision for NSADP/CAADP is to commercialize agriculture, especially through linking of farmers to markets and also emphasizes the critical role agricultural research and extension plays in the development of the agricultural sector.

In addition to this, various new developments have taken place in the regional and global arena in the last few years. Several of SLARI's current and potential collaborating partners have revised their strategies and development plans, indicating areas of future collaboration. Further to this, other development programmes in the country have gained a higher profile for national and development partner assistance.

At the regional and sub regional levels, organizations and programmes, such as the African Union (AU); the New Partnerships for Africa's Development (NEPAD), the Comprehensive African Agricultural Development Programme (CAADP), the Economic Community of West African States (ECOWAS); and Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles/West and Central African Council for Agricultural Research and Development (CORAF/WECARD) have grown in capacity and offer SLARI excellent opportunities for collaboration in the areas of agriculture, environment and natural resource management for sustainable development. Existing and emerging regional and national institutions and programmes also provide a platform for SLARI to work with more partners.

From the global perspective, the Strategic Plan is in line with the Millennium Development Goals (MDGs), in which Sierra Leone, in its capacity as a member of the United Nations, has pledged to reduce extreme hunger and poverty (MDG 1); ensure child and maternal health and combating major diseases (MDGs 4, 5 and 6); promote environmental sustainability (MDG 7); and enhance global partnerships for development (MDG 8) and SLARI has a role to contribute to this efforts. SLARI will, therefore, need to proactively act jointly with UN agencies and international research organizations to address issues related to environment, agriculture and food security.

Taking cognizance of the developments taking place at the national, regional and international levels, SLARI has developed this Strategic Plan for the period 2012-2021. The new Strategic Plan has been developed within the context of the on-going national institutional and policy reforms, taking into consideration the country's new political system and structure of Government as well as the available and emerging opportunities. The Strategic Plan is tailored to strategically position SLARI to contribute significantly to the development of the agricultural sector. The Strategic Plan has also taken into account the achievements and lessons learnt during the last few years of the previous Strategic Plan as well as the challenges and constraints experienced during implementation of the other national and sector guiding policies and plans of the Government.

The development of this new Strategic Plan has been a consultative process involving key stakeholders within and outside SLARI. This was done so as to ensure that it incorporates all constructive views and suggestions from all key stakeholders; builds on the current SLARI achievements and strengths and contributes significantly to the development of the agricultural sector and the country while ensuring proper alignment at the national and regional levels for better outcome mapping and impact orientation.

2.0 SITUATIONAL ANALYSIS

2.1 Introduction

Sierra Leone is located in the lowland humid tropics of West Africa with the capital Freetown on the coastal belt along the Atlantic Ocean. Administratively, the country is divided into three provinces and a total of 12 districts as shown in Annex 6. The country has a land area of 7.3 million hectares of which 5.4 million hectares is potentially arable. Over 80% of the total land area is upland and the rest is lowland with potential for high rice yields. The potentially cultivable lowland area comprises 630,000 ha of inland valley swamps; 120,000 ha of bolilands; 110,000 ha of riverine grasslands; and 200,000 ha of mangrove swamps.

The climate in Sierra is the monsoon-type humid tropic with two distinct seasons. The annual rainfall averages about 3,000 mm, ranging from a low of 2,000 mm in the North to a high of 4,000 mm in the coastal areas. Average monthly temperature range from 23 to 29^{o}C, with a maximum of 36^{o}C in the lowlands towards the end of the dry season to a minimum of 15^{o}C in the highlands at the beginning of the dry season. The soils are generally highly weathered, leached, and acidic. There are abundant water resources, with nine major rivers with catchment areas varying from 720 km^2 (Peninsular) to 14,140 km^2 (Sewa) with high river discharges. Annex 7 shows the main agro-ecological zones of Sierra Leone.

The economy of Sierra Leone is predominantly agrarian and the agricultural sector contributed about 51.9% to the Gross Domestic Product (GDP) in 2002 while industry and service sectors share in GDP was 31.1% and 17.0% respectively. The agricultural sector employs about 70% of the working population. Poverty and food insecurity are major issues of concern in Sierra Leone. The 1995 poverty profile estimated about 75% of the population lived in poverty and more than 66% of the poor lived in conditions of extreme poverty (PRSP, 2004). Poverty is, generally, a rural phenomenon and incidence of poverty is highest among farmers. Chronic malnutrition prevails in situations of low productivity due to poor policies and strategies, poor feeding and care practices and inadequate water and sanitation facilities. There is high levels of dependency on subsistence farming and the absence of agricultural support institutions has also

contribute to the persistence of high levels of vulnerability in some areas. Currently, the total population is 5.5 million and is expected to increase by 5% in 2010 to 5.7 million and by 15% to 6.3 million by 2014.

2.2 Regional Policies and Plans that Influence Sierra Leone's Development

2.2.1 New Partnership for Africa's Development

Africa has lagged behind other continents of the world in terms of agricultural growth due to low levels of productivity. However, there has been a marked increase in the agricultural sector growth in Africa in the past few years ranging from 2.7% in 2002 to 5.0% in 2004. Despite this growth in production, the net per capita agricultural production index fell from 1961 to 2004 owing to high population growth in the continent. As a result of this, the number of the undernourished in Africa has been increasing and reached 211.4 million in 2002/2004.

Realising that Africa region can only take its proper place in the international community if it gains economic strength, African Heads of States and Governments set an ambitious target of 7% annual growth rate in GDP over the next 20 years to eradicate poverty, achieve food security and build the foundations for sustainable economic development on the continent. The African Vision by the African Union/New Partnership for Africa's Development (AU/NEPAD) of attaining 6% increase in agricultural growth through to 2015 is of particular interest given that one of the avenues identified to achieve this target is stimulation and promotion of a culture across Africa of sustainable utilization of the natural resource base. The AU/NEPAD seeks to complement other African initiatives and to use existing frameworks for action, concentrates on priorities organized under two broad thematic areas of peace, security, democracy and political governance and economic and corporate governance. Specific themes include peace, security; democracy and political governance; infrastructure; human resource; health; agriculture; access to markets; environment; culture; science and technology. For all these, NEPAD intends to mobilize domestic and external resources and to establish new forms of partnership with the domestic and international organizations creating opportunities for regional and sub regional institutions such as SLARI.

At continental level, NEPAD hopes to eradicate poverty in Africa and to place its countries on a path of sustainable growth for the next 15 years. It is a commitment of African countries, both individually and collectively, to the MDGs. NEPAD believes that improvement of the performance of the agricultural sector is a prerequisite in meeting its set targets for economic development. It further recognizes that improving the productivity of agriculture rests on dealing effectively with a number of critical constraints such as climatic variability, poor rural infrastructure, unsupportive policies, and weak institutional and regulatory frameworks. Regional and sub regional and national institutions are expected to play a lead role in spearheading science and technology in food systems to address food insecurity, environmental degradation and sustainable natural resources management.

2.2.2 Comprehensive African Agriculture Development Programme

The Comprehensive African Agriculture Development Programme (CAADP) was established by the AU/NEPAD in July, 2003 as the highest policy level framework for the coordinated development of agriculture in Africa. The overall goal of CAADP is to "Help African countries reach a higher path of economic growth through agriculture-led development which eliminates hunger, reduces poverty and ensures food insecurity, and enables expansion of exports." The CAADP is a growth-oriented agriculture development agenda aimed at increasing agricultural growth rates to 6% per year to create the wealth needed for rural communities and households in Africa to prosper. To achieve this goal, CAADP focuses its interventions in four key pillars to achieve measurable outcomes. The four pillars include Expansion of the irrigation sub sector and promoting sustainable land management (Pillar I); Strengthening trade capacity, improving physical market infrastructure and market support areas (Pillar II); Promoting food and nutrition security and dealing with the challenges of the vulnerable and food insecure populations (Pillar III); and Strengthening research institutions and supporting dissemination and farmer adoption of productivity enhancing technologies (Pillar IV).

Pillar IV is mandated to members of the Forum for Agricultural Research in Africa (FARA) and its sub regional organizations. Pillar IV which aims at achieving accelerated gains in productivity requires:

(a) An enhanced rate of adoption by farmers of the most promising available technologies to support the expansion of African production through more efficient linking of research and extension systems to producers.

(b) Active technology delivery and agro-businesses, particularly through the appropriate use of new information and communication technologies.

(c) Renewing the ability of agricultural research systems to effectively generate and adapt new knowledge and technologies while conserving the environment.

(d) Mechanisms that reduce the costs and risks of adopting technologies.

The Framework for African Agricultural Productivity (FAAP) developed by FARA and approved by African governments provides guidelines for implementing Pillar IV of CAADP. FAAP intends to strengthen Africa's capacity for agricultural innovation. This will be done by providing a framework for improved institutional arrangements, especially in respect of capacity building, empowering farmers and strengthening farmers' support services; as well as by promoting resource alignment and increased funding. FAAP embraces the Integrated Agricultural Research for Development (IAR4D) paradigm which places farmers and users at the centre of innovative practices and encourages learning through the interchange of ideas, successes and failures between stakeholders in the agricultural value chains.

2.2.3 Economic Community of West African States

The Economic Community of West African States (ECOWAS) was established on 28 May, 1975 to promote cooperation and integration among West African countries. The Vision of ECOWAS is to create a sub region without frontiers, where the people have access to the enormous resources and utilize them, by creating opportunities of sustainable production and jobs, in the framework of equitable distribution systems; a space within which people ply their business and live in peace in the rule of law, good governance and a healthy environment setting; a zone that is an integral part of the African continental space, in the context of a global village where all human beings live in dignity and benefit from fair trade and mutual solidarity, and guided by shared principles. The Mission for ECOWAS is to promote co-operation and development in all spheres of economic activity through the removal of all forms of trade barriers and obstacles for the free movement of persons, goods and services, as well as the harmonizing of regional sector policies. Its main objective is to establish a large West African common market and create a monetary union.

ECOWAS is the most populous regional economic community in Africa and about 60% of the GDP was derived from economic activities of the region namely, agriculture in the primary sector (24.2%), mines and quarries in the secondary sector (19.3%) and trade in the tertiary sector (15.7%). With respect to the primary sector, agriculture accounts for 79%. Some of the cash crops cultivated in the region such as coffee; cocoa and cotton earn substantial foreign exchange to member states. Within the framework of the ECOWAS Common Agriculture Policy (ECOWAP), there are opportunities for Sierra Leone for joint action in identification of strategic options and sources for poverty reduction and growth, and creation of forums for knowledge support systems that can enhance peer review, dialogue, experience and information sharing, and evidence-based planning as well as joint implementation of agricultural sector polices. The current NSADP/CAADP Compact hopefully will significantly input into the formulation of an ECOWAS sub regional and an African continental compact. This presents opportunities for regional trade in commodities such as milled rice, goats, dairy and poultry products, fruit juices and bio-fuels leading to economic development for the countries in the ECOWAS region

2.2.4 West and Central Africa Council for Agricultural Research and Development

The West and Central Africa Council for Agricultural Research and Development (CORAF/WECARD) is a regional association of the national agricultural research institutes of 21 countries in West and Central Africa that include Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Côte d'Ivoire, Democratic Republic of Congo, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo. CORAF/WECARD aims to improve the efficiency and effectiveness of agricultural research in the region by supporting, consolidating and strengthening the capacities of the National Agricultural Research Systems (NARS) in the member countries. Specifically, it aims at enhancing

co-operation between the NARS, development partners, regional and internal bodies, private sectors, Non-Governmental Organizations (NGOs) and users of research results.

CORAF/WECARD is entrusted with the task of implementing and organizing a lasting and efficient framework for agricultural research co-operation and coordination in West and Central Africa. The platform offers an opportunity for mutual and innovative exploitation of comparative advantage of the partners leading to synergies among research collaborators. The current framework for action focuses on development of appropriate technologies, improved policy and advocacy, increased capacity among stakeholders, stronger and better coordination among the NARS and dissemination of information and knowledge. At the regional level CORAF/WECARD has been mandated by ECOWAS to take lead in coordinating implementation of CAADP Pillar IV in West and Central Africa. This involves enhancing capacities of the National Agricultural Research Systems (NARS) within the region for development of technologies and innovations and appropriate mechanisms for wide-scale dissemination and adoption as well as implementation of sustainable and supportive policies within the member countries.

2.3 National Policies and Plans Guiding Sierra Leone's Development Agenda

2.3.1 Interim Poverty Reduction Strategy Paper and National Recovery Strategy

The road to economic growth and poverty reduction for Sierra Leone started with the development an Interim Poverty Reduction Strategy Paper (IPRSP) in 2001 (GoSL, 2001). The strategy emphasized the continued implementation of sound economic policies to re-launch the economy within an overall framework of good governance. The IPRSP described the country's macroeconomic, structural, social policies and programmes aimed at promoting economic growth and reducing poverty. The IPRSP was constructed around three Pillars that included (i) Good Governance, Peace and Security; (ii) Food Security and Job Creation; and (iii) Growth and Human Development. These Pillars incorporated the United Nations Millennium Development Goals (MDGs) targets as part of the goals of its development policy and therefore considered a number of short to medium-term challenges and proposed actions that not only impacted immediately on the living conditions of the people but also laid a solid base from which to address the long-term causes of conflict and poverty.

The major challenges identified in the IPRSP in the promotion of food security and job creation included (i) achieving high and sustained broad-based economic growth, particularly in rural areas where agricultural development and increased food production were central; (ii) providing essential social and economic services and infrastructure to the poor; and (iii) improving governance. Consolidation of peace and security was essential if the country was to attract the investment necessary to break the cycle of poverty. In addition to these aims, the IPRSP also considered the following short-term challenges that needed to be met immediately:

- The impact of the spread of Human Immunodeficiency Virus/Acquired Immune-deficiency Syndrome (HIV/AIDS) and other diseases such as malaria, typhoid and wide-ranging communicable diseases.
- The need to ensure affordable shelter for those households that are still deprived of it.
- The process of re-integration.
- The need for labour-intensive approaches to sector programmes, especially public works, mining and agriculture.
- Programmes to support the tertiary sector, including tourism.

The IPRSP also recognized the links between poverty and the environment and mainstreamed multi-sectoral environmental measures into the Pillar strategies. In 2002, the IPRSP was complemented by the development of the National Recovery Strategy (NRS) based on district and local recovery plans that emphasized the consolidation of state authority, peace-building, promotion of reconciliation, enforcement of human rights, resettlement, reintegration and the rebuilding of communities.

2.3.2 Sierra Leone Vision 2025

The successful implementation of the IPRSP and NRS resulted in economic recovery between 2001 and 2004. With international support, progress was made in consolidating security, in rebuilding social sectors and economic capital, and supporting the vulnerable. As part of this new beginning set by the IPRSP and NRS, Sierra Leone developed the Vision 2025 in 2005, as the country's national vision or long-term development plan. Vision 2025 gives a strategic diagnosis of the country's past and its present situation, presents alternative possible national futures, and sets out the future that the people have agreed to build. The aim of the Vision is to create a prosperous society that cares about people and the environment, and was based on the desire to create a better future for Sierra Leone. A future characterised by the virtuous circle of peace, stability and wealth creation in place of vicious circle of poverty and development. Vision 2025 has now been adopted as the strategic and comprehensive development approach embracing all segments of society. The strategic areas of focus identified and which must become the focus of all plans, policies and programmes for Sierra Leone include:

- A competitive private sector-led economy with effective indigenous participation.
- Creating a high quality of life for all Sierra Leoneans.
- Building a well-educated and enlightened society.
- Creating a tolerant, stable, secure and well-managed society based on democratic values.
- Ensuring sustainable exploitation and effective utilization of natural resources, while maintaining a healthy environment.
- Becoming a science and technology driven nation.

The Vision 2025, therefore, provides a road map to the development of a better future for the country, and emphasizes that this will require the active participation and commitment of both the public and private sectors and all the people of Sierra Leone.

2.3.3 Second Poverty Reduction Strategy Paper: The Agenda for Change

Following the development of the country's Vision 2025, it became necessary that a comprehensive poverty reduction strategy supporting the Vision 2025 and pursuing economic, social and political rebuilding in the country should be developed to deliver the economic growth envisioned in the Vision. In this regard, the Second Poverty Reduction Strategy Paper (PRSP-II): "The agenda for Change" was developed covering the period 2008-2014 (GoSL, 2004).

The PRSP-II presents a comprehensive medium-term development strategy that focuses on four strategic priorities that include (i) enhancing the national power supply; (ii) increasing agricultural productivity and competitiveness; (iii) significantly improving the national transportation network; and (iv) promoting sustainable human development through decentralized service delivery. These priorities are underpinned by good governance, macroeconomic stability, private sector development, financial sector reform, and natural resource management. The Agenda refers to agriculture as the engine for economic growth with a focus on the agricultural value chains of input supply, production, value addition (agro-processing) and marketing. The Agenda recognizes that from a pro-poor perspective, raising the quality and value-added productivity in agriculture in general is critical to poverty reduction as most of the population is engaged in agriculture. Specifically, the strategy emphasizes:

- Increasing agricultural productivity; in particular among the rural poor smallholders, who constitute the poorest segment of society, through a variety of support measures along the entire agricultural value chain, from pre-planting to marketing.
- Promoting diversified commercial agriculture through the private sector.
- Improving agricultural research and extension service delivery.
- Promoting efficient and effective resource management systems.
- Improving agricultural output through value addition, post-harvest loss reduction, agro-processing, packaging and building rural market infrastructure.
- Managing and exploiting Sierra Leone's fishery and marine resources.

2.3.4 National Sustainable Agricultural Development Plan

The National Sustainable Agriculture Development Plan (NSADP) follows from the Vision 2025 and the Second Poverty Reduction Strategy Paper: the Agenda for Change. It provides the broad framework for putting the objectives of the Government's Agenda for Change into action. The Objectives set out by the Sector to achieve the Vision of the Agenda for Change include the following:

- Increasing agricultural productivity (intensification and diversification), in particular among the rural poor smallholders, who constitute the poorest segment of society, through a variety of support measures along the entire agricultural value chain.

- Promoting commercial agriculture through private sector participation: Commercial agriculture will be promoted by creating an enabling environment that is attractive for private sector investment.
- Improving agricultural research and extension delivery systems: National Agricultural Research and Extension policies, strategies and programmes are to be formulated.
- Promoting efficient and effective sector resource management systems, including the establishment of a database for agricultural statistics as well as creating a sector coordination mechanism, in order to strengthen sector policy formulation, planning, monitoring and evaluation, and resource management.
- Mainstream cross-cutting issues in agriculture in order to educate farmers about important issues such as self-sufficiency, gender, youth employment, farmer health including HIV/AIDS and environmental sustainability.
- Managing and exploiting Sierra Leone's fishery and marine resources and accessing local and international markets and forestry resources to mitigate against climate change.

The NSADP provides the roadmap for moving agriculture, forestry and fisheries forward to both address Sierra Leone's growing needs due to population growth and to create additional income to the national economy. The overall goal is to increase the agricultural sector growth from its current 4.2% to a target of 6% per annum to enhance incomes of the agricultural product value chain player. As a Government initiative and in order to attract and coordinate investments in the sector and in tandem with the AU/NEPAD Comprehensive Africa Agricultural Development Programme compact process, NSADP has been formulated to provide guidance for short-, medium- and long-term investment programmes for the agricultural sector. The NSADP/CAADP serves to assist the country and development partners to share a common vision for development of Sierra Leone.

The NSADP/CAADP has the Vision to commercialize, agriculture especially through linking of farmers to markets. It also emphasizes the critical role agricultural research and extension plays in the development of the agricultural sector. The document emphasizes Government's support as critical in the development of the private sector, including organization of small-holder to strengthen their position both domestically and globally through prioritized efforts to promote comparative advantage in each district. The four major sub-programmes of NSADP include:

(a) Commercialization of key commodities through (i) Small-holder Commercialization Scheme; and (ii) Medium and Large-scale Farmers Promotion Scheme.

(b) Agricultural infrastructure with focus on (i) Rehabilitation, development and up-grading of feeder roads; (ii) Development of irrigable swamps; (iii) Rehabilitation and modernization of post-harvest technology such as processing facilities; and (iv) Rehabilitation and construction of research centres and Ministry of Agriculture, Forestry and Food Security (MAFFS)/Ministry of Fisheries and Marine Resources (MFMR) facilities.

(c) Private sector promotion through formulation of policies and legislations that will encourage sustainable domestic and international investments in the agricultural sector.

(d) Efficient and effective management that will ensure, among others, coordination, transparency and mutual accountability.

2.4 Challenges Facing the Sierra Leone Agricultural Sector

Sierra Leone is naturally endowed with land, water, human resource, and favourable climatic conditions capable of sustaining a highly productive agricultural sector. However, the contribution of the country's agricultural sector to growth, attainment of food security and increased prosperity for the people is still lagging behind expectations and recognized potential. The country has been slow in developing most commercial crops despite huge potential for export and diversifying sources of food for human consumption.

From the situational analysis of the agricultural sector, the challenges and constraints facing the sector vary with respect to commodities and regions of the country. The effects of some of the challenges and constraints have been accelerated by the past worldwide food price crisis and its underlying drivers. Like in most other countries emerging out of civil conflicts, the main challenges and constraints limiting the growth of the agricultural sector in Sierra Leone, as indicated in many national policies and plans, occur in the strategic areas of (a) Production and processing; (b) Policies, institutions and regulatory functions; (c) Natural resources and infrastructure (d) Public expenditure; and (e) Macroeconomic factors and the external environment. The major challenges facing the country's agricultural sector under each of the strategic areas are as indicated below:

(a) Production and processing

(i) ***Reduced effectiveness of extension services*****:** The effectiveness of extension services has declined over the years due to inappropriateness of extension models pursued, delayed adoption of alternative appropriate models and sharp reduction in the operational budgets.

(ii) ***Limited demand-driven research and low absorption of modern technologies:*** Use of modern science and technology in production is still very limited. While lack of affordable credit has partly contributed to this situation. Equally important is the inadequate research-extension-farmer linkages and lack of demand-driven research.

(iii) ***High cost and increased adulteration of key inputs*****:** The cost of key inputs such as seed and fertilizers has remained too high and cases of adulteration and other forms of dishonesty have increased. For this reason, farmers have substantially reduced use of quality inputs such as seed, fertilizer and pesticides.

(iv) ***Pests and diseases*****:** There have been high levels of waste due to pre- and post-harvest losses occasioned by pests and diseases and lack of proper handling and

storage facilities. Smallholder farmers and pastoralists are unable to cope with pests and diseases mainly due to lack of finances, and in many cases, lack of information, reflecting weaknesses in the extension services system.

(v) ***Low and declining soil fertility*:** The rising population density has contributed to the subdivision of land to uneconomically small units, the reduction of the fallow periods and continuous cultivation, leading to the rapid depletion of soil nutrients, declining yields and environmental degradation.

(b) Policies, institutions and regulatory functions

(i) ***Inappropriate legal and regulatory framework*:** The existent of outdated legal and regulatory frameworks have continued to constrain agricultural development, trade and effective competition.

(ii) ***Multiple taxes:*** Farmers have been subjected to multiple taxes as they transport or market their farm produce. This has contributed to the reduction of net farm incomes and created distortions in marketing structures.

(iii) ***Poor governance and corruption:*** Cooperatives and farmers' organizations are vital for good performance of the agricultural sector by giving farmers advantages of economies of scale in dealing with credit and marketing of inputs and outputs. Poor governance and corruption in key institutions supporting agriculture has led to the collapse most of these institutions or has weakened them in terms of finances and manpower.

(iv) ***Weak surveillance on offshore fishing*:** Lack of capacity to effectively monitor and enforce compliance and regulations governing the exploitation of offshore territorial waters has limited the country's ability to fully exploit the offshore fishing potential.

(v) ***Lack of coherent land policy*:** There is no comprehensive land policy covering use and administration, tenure and security, and delivery systems of land. This has resulted in low investment in the development of land leading to environmental degradation.

(vi) ***Incomplete liberalization*:** The Government has undertaken significant reforms especially in the last few years. The liberalization process for some of the cash crops is, however, yet to be completed leading to their poor performance in the global market.

(vii) ***Inadequate disaster preparedness and response:*** There is low preparedness and response capacity with respect to disasters caused by drought, floods, fires, diseases and pests. Early warning and response systems need to be strengthened and widened. Also, the offer of mechanisms to cope with damages caused by disasters such as reconstruction and re-stocking funds needs to be increased.

(c) Natural Resources and Infrastructure

(i) Poor infrastructure: Underdeveloped rural roads and other key physical infrastructure have led to high transport costs for farm inputs and agricultural products to markets. This has continued to reduce the ability of farmers to compete adequately alongside others in the sub region. In addition, electricity in rural areas is expensive and often not available leading to reduced investment especially in cold storage facilities, irrigation and processing of farm produce.

***(ii) Inadequate markets and marketing infrastructure*:** Agricultural marketing information and infrastructure are poorly organized and institutionalized in the country. The domestic market is small, fragmented and lacks an effective marketing information system and infrastructure. The dependence on a few external market outlets makes agricultural exports very vulnerable to changes in the demand for agricultural products and unexpected imposition of non-trade barriers by foreign markets.

***(iii) Inadequate quality control, storage and processing infrastructure*:** The export of local products has faced entry restrictions due to poor packaging, damage during transportation, poor handling and infections. There is lack of a Code of Conduct for exporters, quality control and cold storage infrastructure. Lack of storage and processing facilities has also constrained marketability of perishable goods such as fish, dairy products and vegetables.

(iv) Information technology and communication development: The benefits of information communication technology are not fully utilized in Sierra Leone and are often out of reach of the poor and in rural areas due to inadequate infrastructure and human capacity.

***(v) Insufficient water storage infrastructure*:** The high variability of weather events in forms of floods and droughts is likely to remain high or even increase in light of global climate change. Water harvesting and storage infrastructure needs to be expanded to store water run-off for livestock watering points and irrigated agriculture and fish farming.

(vi) Degradation and subsequent loss of biodiversity: The country's biodiversity is under high degree of threat due to various forces, man-made and natural factors such as natural habitat degradation, rapid deforestation, social and political unrest, invasion by alien species and inadequate recognition of the value of indigenous and/or traditional knowledge systems.

(vii) Increasing population and demand for food: Population growth rate in Sierra Leone is high ranging from 2 to 3%. This high population growth rate increases the demand for food and natural resources. The increased demand for food and natural resources is expected to lead to scarcity and consequently triggers conflicts over access and environmental degradation due to excessive use.

(viii) ***Poor resource management:*** Poor resource management continues to be a major development constraint in Sierra Leone. This situation has negatively affected national development including sustainable land use, environmental degradation, land tenure, insecurity, encroachment, unplanned settlements and loss of revenue among others. Natural resource degradation, low level agricultural productivity, declining share from the global trade and limited success of industrial development have weakened the country's position to fulfil the basic needs of its people.

(ix) ***Climate change:*** Climate change and global warming are global phenomena that transcend national boundaries. In the recent years, human development activities have significantly contributed to atmospheric greenhouse gas emissions and hence global warming, with serious consequences for mankind and other life forms. These phenomena have affected performance of the agricultural sector and food security; increased the prevalence of human, crop and livestock pests and diseases, and impeded road transport and the delivery of goods and services at times of need and trade.

(d) Budgetary allocation and credit availability

(i) ***Insufficient Budgetary allocation:*** In 2003, Sierra Leone and other African countries committed under the Maputo Declaration, to allocate 10% of their Government's budget to agriculture but the country has not yet achieved this. Insufficient budgetary allocation to the sector is a key constraint and has reduced human resources and service delivery by Government institutions.

(ii) ***Inefficiency and skewed patterns of public expenditure:*** The bulk of Government spending in sector ministries is used on salaries and other emoluments for staff leaving little for operations, maintenance and delivery of programmes. The Medium Term Expenditure Framework (MTEF) budgeting system has been a challenge to ministries given that the high wage bill crowds out other priority expenditures.

(iii) ***Limited capital and access to affordable credit*****:** The main factor which farmers, particularly small- scale farmers, point out as causing low productivity in agriculture is inadequate credit to finance inputs and capital investment. The currently operating micro-finance institutions reach only few smallholder farmers provide very short-term credit and their effective lending rates are very high. The formal banking system is yet to develop credit facilities that particularly suit small-scale farming business.

(e) Macroeconomic factors and external environment

(i) ***Unfavourable macroeconomic environment*****:** A stable macroeconomic environment is vital for sustained growth and investment. Although in the recent past the Government has made considerable progress in stabilizing

the macroeconomic environment, persistent large public sector borrowing requirements, high lending interest rate, and volatile exchange rates have discouraged investment in the agricultural sector.

(ii) ***Unfavourable external environment*:** Deterioration in terms of trade due to a decline in world commodity prices has particularly impacted negatively on incomes from cash crops such as cocoa, coffee and oil palm farming. Tariffs and non-tariff barriers imposed by developed countries have made it difficult for developing countries such as Sierra Leone to access their markets.

(iii) ***High poverty levels:*** Poverty continues to afflict a large number of Sierra Leoneans with agricultural producers being the single largest group among the poor. Poverty constrains their ability to invest in modern and productive agriculture. This is part of a vicious cycle that keeps them in poverty.

(vi) ***Increasing incidence of diseases and drug abuse*:** The increasing incidence of HIV/AIDS, malaria and waterborne diseases as well as drug and substance abuse and the corresponding deaths have resulted in the loss of productive agricultural personnel and manual labour force for sustained farming knowledge and diversion of investible resources to the treatment of the diseases.

2.5 Internal and External Environment Analysis

SLARI is mandated to play the critical role of providing knowledge, information and technologies needed to spur growth and development of the agricultural sector. In order to identify the Institute's capability in fulfilling this set mandate, the Institute's internal and external environment analysis was carried out.

The internal environment analysis was aimed at identifying the Institute's strengths and weaknesses in relation to its set mandate. Through this analysis, the Institute aimed at identifying its requirements with the view of assessing its current capacity to deliver on its mandate. Since SLARI is a knowledge and information producing institute, the most relevant aspects that were analyzed were those related to availability, utilization and management of inputs (human, financial and physical/infrastructural resources), the processes carried out to transform the available inputs into outputs and products (knowledge, information and technology).

With respect to SLARI's external environment, a situational analysis was carried out to:

- Study the relationships between the Institute and its relevant external environment in terms of current and emerging opportunities and threats.
- Provide the Institute's management with the capacity to respond to critical questions from the external environment.
- Explore future scenarios of the external environment so as to include them in the decision-making process.
- Identify and prioritize emerging opportunities and threats to effectively devise strategies to address them.

- Build a vision for the Institute based on indications given by the emerging realities in the external environment.
- Understand market dynamics in order to develop need-driven customer-oriented services and products.

The analysis of the opportunities and threats was guided by the principal dimensions of the Institute's general and operational external environments that include Political, Economic, Socio-cultural, Technological, Institutional, Legal and Environment (PESTILE) dimensions.

2.5.1 Existing Strengths

The existing strengths that allow SLARI to take advantage of the available opportunities and those that protect it from external threats include the following:

(i) ***Human capacity:*** Over the last few years, SLARI has taken serious steps to re-establish and develop a critical mass of skilled and experienced technical and support staff with the capacity and capability to carry out research in at least two of its centres. This strength is enhanced by collaboration mechanisms that allow the Institute Centres to partner and collaborate with other reputable organizations as well as retaining a pool of highly qualified consultants.

(ii) ***Financial support:*** SLARI has access to basic financial resources from the Government to support personnel salaries and carry out some research while rehabilitating the infrastructure and building of capacity.

(iii) ***Physical and infrastructural capacity:*** SLARI has basic physical and infrastructural capacity for carrying out research in at least two of its Centres while the other centres have sites for development.

(iv) ***Donor support and confidence:*** Within the short time of its existence, SLARI has developed a culture of accountability, transparency and impact orientation leading to building of confidence and credibility among development partners.

(v) ***Regional and international reputation:*** As a research institution in a country that is emerging out of civil conflict, SLARI is building a regional and international reputation of excellence in agricultural research for sustainable development.

(vi) ***Partnerships and collaboration:*** SLARI is making excellent progress in establishing strategic partnerships and collaboration with other reputable institutions within and outside the region in agricultural research for sustainable development.

(vii) ***Institutional capacity:*** The spread of its currently functional and proposed research centres around the country and steps taken by the Government to introduce public and private partnership in carrying out research is beginning to strengthen SLARI as a versatile network capable of dealing with the diversity found in the agricultural sector.

(viii) ***Political goodwill:*** Currently, SLARI enjoys good political will that is enabling it to transact business as a recognized public institution.

(ix) ***Existence of strong community support***: As a recognized public institution, SLARI is gaining strong community support that provides a good base of enhanced focus on community needs. These needs are expected to be more demanding as the organization increasingly takes a more marketing orientation.

2.5.2 Current Weaknesses

The current weaknesses that may prevent SLARI from taking advantage of the available opportunities and those that do not protect it from external threats include the following:

(i) ***Lack of clear human resource management and development policies and strategies*:** Weak staff development and management policies, unclear terms and conditions of service, non-competitive remuneration and incentive schemes to reward outstanding performance has led to low motivation and may affect the recruitment of skilled staff.

(ii) ***Inadequate human resource capacity:*** Currently, only two of SLARI centres have the basic staff and, therefore, the Institute is operating below the optimum staff level in terms of numbers, skills and disciplinary mix required to enable it realize its mandate.

(iii) ***Poor resource flow****:* Untimely availability and inadequacy of research operating funds, field and laboratory equipment continue to constrain implementation of activities.

(iv) ***Inadequate market and policy expertise:*** The manpower available in the currently functional centres is heavily biased towards biological specialization with very limited capacity to deal with non-production aspects of the product value chain or social and policy research.

(v) ***Inappropriate research outputs and lack of market focus:*** Many research outputs coming out of the currently functional research centres are either not available in a form that is usable and accessible to clients, or do not adequately address the challenges experienced by the stakeholders leading to very low adoption and use of the available technologies.

(vi) ***Weak research planning, implementation and management:*** Being a newly established institute, its overall research planning and management is weak leading to erratic research direction and lack of impact.

(vii) ***Inadequate attention to modern technologies:*** SLARI has not taken full advantage of modern technologies such as tissue-culture, biotechnology, participatory plant breeding and modern communication and information technologies.

(viii) ***Lack of institutional intellectual property rights policy****:* Currently the Institute lacks an Intellectual Property Right policy to spell out issues of ownership rights, disclosure and management mechanisms, distribution of royalties, commercialization strategies and other pertinent issues that would make it possible to apportion benefit to deserving recipients.

(ix) ***Weak national coordination:*** Being a newly established institute, there is inadequate coordination of the different research centres, programmes and projects which is seriously affecting efficiency and productivity of the system.

(x) ***Over-reliance on donor funding:*** A big proportion of research operational funds comes from external donors and this has often resulted in research planning and management cycles that are responsive to donor agenda rather than national priorities as well as challenging its financial sustainability.

(xi) ***Limited ability to access modern technologies:*** The Institute has not taken full advantage of the available modern technologies to enhance its efficiency and effectiveness in research and development of products and services.

(xii) ***Lack of strategic links with development partners:*** The institute has not yet developed elaborate strategies and mechanisms to reach out to development partners to assist in funding some of its research programmes and development of infrastructure and research facilities.

2.5.3 Available and Emerging Opportunities

The following are the available and emerging opportunities and prospects that are likely to have a significant impact on agricultural research over the next five to ten years.

(i) ***Potential for development partners funding****:* Development Partners funding to SLARI's research programmes and projects is an area that remains largely untapped and is expected to be increasingly explored as the number and capacity of the Institute's scientific staff, centre infrastructure and other research facilities are improved over the next few years.

(ii) ***Potential for use of Information and Communication Technology:*** Advancement in ICT paves way for SLARI to benefit from achievements by other organizations worldwide, while sharing its own achievements with them.

(iii) ***Supportive government policies:*** The prevailing policy frameworks being put in place by the Government are increasingly recognizing the role of research in the development of the agricultural sector and the overall national economic growth thereby widening the potential for increased reliance on the Institute's products and services.

(iv) ***Potential to benefit from emerging biotechnology techniques****:* Biotechnology has opened opportunities to satisfy human demands in terms of food, shelter and other needs. SLARI can make use of biotechnology to speed up breeding projects through such techniques as molecular markers, gene transfer and tissue-culture for multiplication of high quality seed.

(v) ***Supporting policy framework for modernization and commercialization:*** The currently on-going review of policy frameworks supporting increased investment in agricultural modernization offers opportunity for investment in research.

(vi) ***Decentralization of services:*** The national effort to decentralize services to the district level provides an opportunity for building rural constituency, capacity and increased involvement in research complemented with intensive human resource development programme to improve management and coordination skills.

(vii) ***Emerging regional markets****:* The markets made possible by regional integration and the opportunities to develop service hubs in the areas of processing, quality

control and export provides an excellent opportunity as this has not been exploited effectively.

(viii) ***Expanding domestic market opportunities****:* The expanding domestic market for crops, livestock, fish and forestry products with a high income elasticity of demand provides excellent trading opportunities. This should encourage farmers and other stakeholders to demand for appropriate technologies in order to compete in the wider regional and international markets.

(ix) ***Availability of natural resources:*** The unexploited natural resource base, abundant sources of surface and underground water and existence of several agro-ecological zones presents an unlimited opportunity for expansion and diversification in crops, livestock, fish and forestry production.

(x) ***Farming as part of the national culture:*** Farming, livestock keeping and fishing are a way of life amongst most of Sierra Leoneans and is likely to get better if agriculture is made increasingly profitable.

(xi) ***Growth of agribusiness:*** The development of private agribusiness and large-scale farming enterprises is likely to create potential opportunities for strategic partnerships between them and the smallholder farmers leading to sharing of knowledge and information.

(xii) ***Existence of technological gaps****:* Globally, there are technological advances that can be tapped and adopted to improve productivity. There are several indigenous technical knowledge (ITK) that can be modernized and packaged.

(xiii) ***Emerging partnerships and collaboration:*** There are growing number of potential partners and collaborators including other research institutes, NGOs, the agro-industry and commercially-oriented farmers that SLARI can establish beneficial partnerships and collaborations with.

(xiv) ***The environment and climate change:*** The environmental degradation and climate change provide the Institute with opportunities to engage in the development of appropriate mitigation measure to reverse/arrest these situations.

2.5.4 Current and Emerging Threats

The following are the current and emerging threats that are likely to have a significant negative impact on agricultural research over the next five to ten years:

(i) ***Economic liberalization:*** The global trend of market liberalization has both positive and negative effects on the country's agricultural sector. Some of the negative effects include dumping of cheap crops, livestock, fish, and forestry commodities and products from other countries which could suppress local production.

(ii) ***Weak policy coordination:*** Inadequate policy coordination among different agricultural sector ministries and other service providers can undermine research efforts and adoption of technologies.

(iii) ***Regional integration:*** The current move towards regional economic integration could undermine the gains made in local entrepreneurship leading to low demand of agricultural technologies.

(iv) ***High cost of farm inputs:*** High input prices relative to output prices could discourage the uptake of new technologies.

(v) ***Climate change:*** New biophysical constraints will emerge as a consequence of changes in the global climate thus posing new challenges such as droughts, floods and new crops, livestock, fish and forestry pests and diseases**.**

(vi) ***Brain drain due to competition:*** Some other institutions are able to provide better incentives which could lead to SLARI scientists leaving or make it difficult for the Institute to attract and retain qualified staff.

(vii) ***HIV/AIDS pandemic, high incidences of malaria, drugs and substance abuse:*** These have continued to severely affect rural household labour and skilled manpower in various fields and disciplines, impacting negatively on sustainable management of environment and natural resources in the region.

2.6 Stakeholder Analysis

In carrying out its functional obligations, SLARI interacts with a number of internal and external stakeholders. These stakeholders can either provide opportunities for the Institution to enhance its efficiency and effectiveness or present threats that are likely to have a significant negative impact on the implementation of the Strategic Plan.

In preparing this Strategic Plan, a stakeholder analysis was conducted to identify the interests, roles/responsibilities, comparative advantages and contribution of the various stakeholders in its development and implementation. This exercise involved carrying out an analysis of the broad stakeholder categories that have a complementary role or synergy to SLARI's effort in the development and implementation of the Strategic Plan, taking into considerations the various ways they may influence the implementation of the Strategic Plan. The result of this analysis is shown in Table 2.1.

Table 2.1: Broad stakeholder categories and their expected contribution in the development and implementation of the SLARI Strategic Plan

Stakeholder Category	Potential contribution to the implementation of the Strategic Plan
1. Agricultural Sector and other related ministries	Collaboration in programme development, implementation, coordination and provision of quality and efficient extension services, policy guidelines, synergies and capacity building, market information and access. Formulation of collective action policies, community mobilization for collective action, agricultural products input and output markets, access to credit and other financial arrangements.

2.	Private sector	Partnership in research and resource mobilization, entrepreneurship development, investment in facilities development, establishment and management of appropriate research endowment fund.
3.	Agricultural sector research institutions and universities	Provision of expertise, professionalism, capacity building and promotion of science, technology and innovations and collaboration/partnerships in the development and implementation of research programmes.
4.	SLARI Council	Overall supervision and coordination of the Institute's administration and research functions.
5.	City, Municipal and County Councils	Management and regulation of markets, levies, provision and maintenance/management of infrastructure and sanitation, co-financing of critical research areas.
6.	Infrastructure development and other related ministries	Provision of power, roads, telecommunications and early warning systems. Setting health standards and collaborative work to minimize health hazard from agricultural related activities.
7.	Regional and international research and development organizations	Cooperation in the areas affecting agricultural research, implementation of agreements and treaties, capacity building, resource mobilization, international lobbying and technical support.
8.	Local and international Non-governmental organizations	Mobilization of resources, communities and up-scaling technologies. Collaboration and partnership in the development and implementation of research programmes and projects.
9.	Community-based organizations, Faith-based institutions and Farmer organizations	Community empowerment, awareness creation, capacity building, resource mobilization, advocacy networking, linkages and technology/information dissemination, lobbying and assistance in farmer production and marketing groups.
10.	Agri-business including processors, input dealers, seed companies, merchants	Provision of quality agricultural inputs, credit facilities, capacity building, dissemination of current technologies; awareness creation; and provision of additional research funding.
11.	Farming communities	Local knowledge, resource ownership, good will, technology development, adaptation and uptake.
12.	Regulatory bodies	Provision of quality advisory and regulatory services and setting of standards.

13. Parliament	Enactment of agricultural policies and legislations and approval of budgets and bills.
14. Development partners	Provision of technical support, finance assistance, capacity development and consultancy.
15. Electronic and print media and ICT organizations	Dissemination of information through their wide coverage and communication networks and awareness creation. Development and maintenance of relevant databases, innovative packaging and dissemination of information.
16. Agricultural training institutes	Capacity building for mid-level extension and research personnel.
17. Professional bodies	Assurance of professionalism and best practises in agricultural research, provision of technical expertise, ethics and standards.
18. Financial institutions	Provision of financial facilities, saving and credits, investment and capacity building.

3.0 THE SLARI INSTITUTIONAL STRATEGIC DIRECTION

3.1 Critical Strategic Issues

Following critical analysis of the SLARI operating environment outlined/presented in Chapter two, the broad Critical Strategic Issues that need to be addressed in order to solve the major challenges facing the Institute's mandate area and take advantage of the available and emerging opportunities and prospects were identified. Addressing these broad Critical Strategic Issues is also expected to enable the Institute improve its efficiency and effectiveness in the generation and promotion of innovative agricultural technologies and empowerment of stakeholders. This shall, in turn, enable the institute to position itself strategically to contribute significantly to the development of the agricultural sector and the overall national economic growth leading to the improvement of livelihoods, income generation and food security. The identified broad Critical Strategic Issues include the following:

(i) ***Strengthening of research planning, implementation and management:*** Development and operationalization of appropriate mechanisms for streamlining research planning, implementation and management for better outcome mapping and impact orientation.

(ii) ***Improvement of access and utilization of modern technologies:*** Development of appropriate mechanisms for catalyzing the access and utilization of modern technologies such as tissue-culture, biotechnology, participatory plant breeding and modern communication and information technologies.

(iii) ***Development of institutional Intellectual Property Rights policy****:* Development and operationalization of appropriate institutional Intellectual Property Right policy.

(iv) ***Improvement of national research coordination:*** Development and operationalization of appropriate mechanisms for effective and efficient national research coordination.

(v) ***Supporting formulation of policy framework for modernization and commercialisation:*** Continuous lobbying and advocacy for formulation of appropriate policy frameworks supporting increased investment in agricultural modernization offers opportunity for investment in research.

(vi) ***Development of strategic links with development partners:*** Development and operationalization of effective and efficient strategic links with development partners for assistance in funding research programmes and development of infrastructure and research facilities.

(vii) ***Establishment of partnerships and collaboration:*** Establishment and operationalization of effective and beneficial partnerships and collaboration with other relevant research institutes and organizations

(viii) ***Improvement of the institutional financial sustainability*****:** Increasing the sources of sustainable funding and finance mechanisms coupled with an efficient management of funds within the framework of Agricultural Product Value Chain (APVC) in SLARI and the wider National Agricultural Research System (NARS).

(*ix)* ***Establishment of effective National Agricultural Research System:*** Spearheading the process of identifying suitable framework and arrangements that will facilitate the establishment and functioning of effective (NARS).

(x) ***Planning, development and management of human resources:*** Establishment and operationalization of appropriate institutional arrangement and mechanisms for effective and efficient planning, staffing, development and management of human resources so as to attract and retain qualified staff.

(xi) ***Development and management of physical resources:*** Establishment and operationalization of appropriate institutional arrangement and mechanisms for effective and efficient development and management of physical resources and research facilities.

(xii) ***Performance orientation:*** Development and operationalization of appropriate mechanisms for transforming the culture and attitude within SLARI to be more performance oriented.

(xiii) ***Conservation and sustainable use of biodiversity:*** Creation of public awareness and positive attitude on the need to conserve and sustainable use of biodiversity.

(xiv) ***Market-responsive and client-orientation:*** Development and implementation of market-responsive and client-oriented agricultural research programmes and projects that generate and disseminate demand-driven, problem-solving, profitable and environmentally sound technologies and innovations on a sustainable basis.

(xv) ***Improvement of the linkage between stakeholders:*** Improvement of linkages between research, extension, farmers/stakeholders in the identification of challenges and constraints facing the agricultural sector/agricultural product value chains, finding the resources to generate appropriate technical solutions and making stakeholders aware of the solutions.

(xvi) ***Establishment of beneficial linkages, partnerships and collaboration:*** Promotion of linkages, partnerships and collaboration among various categories of service providers in the conduct and financing of agricultural research.

(xvii) ***Strengthening organizational marketing:*** Development and operationalization of aggressive institutional marketing strategies to advocate for SLARI's role and contribution to the current and future development of the agricultural sector and national economic growth.

(xviii) ***Realignment of the SLARI mandate and core functions:*** Review and realignment of the SLARI mandate, core functions, structure, staff competence and culture aimed at improving institutional effectiveness and efficiency so as to play a key role in agricultural research nationally, regionally and globally.

(xix) ***Formulation of enabling policies and legal frameworks****:* Continuous lobbying and advocacy for formulation and implementation of appropriate policies and legal frameworks to create an enabling environment aimed at improving the conduct and financing of agricultural research.

(xx) ***Promotion of uptake and utilization of research outputs:*** Development of appropriate mechanisms for catalyzing uptake and utilization of knowledge, information and innovations.

(xxi) ***Improvement on the use of information and communication technology:*** Development and operationalization of appropriate strategies to promote the of information and communication technology.

(xxii) ***Mainstreaming of crosscutting issues:*** Development of strategies to respond to different challenges brought about by crosscutting issues such as ICT, HIV/AIDS, gender and drug and substance abuse in all SLARI programmes and projects.

3.2 Research Guiding Principles for Sustainable Growth in the Agricultural Sector

SLARI was established by an Act of Parliament 2007 as the sole Government agricultural research and agricultural technology generating body for the benefits of the farming, fishing and forestry sectors and provide for other related matters. In view of this, SLARI is implementing the Government agricultural policies and supporting the implementation of CAADP Pillar IV. The Institute expects to carry out this mandate through research programme areas of focus to be coordinated and implemented by its research centres spread throughout the country. The Institute expects to do this in accordance with the following Framework for Africa's Agricultural Productivity (FAAP) guiding principles for growth in agricultural production:

- Empowerment of end-users to ensure their meaningful participation in setting priorities and work programmes for research, extension, and training to ensure their relevance.
- Planned subsidiarity to give responsibility and control over resources for agricultural research, extension and training activities at the lowest appropriate level of aggregation (local, national and regional).
- Pluralism in the delivery of agricultural research, extension and training services so that the diverse skills and strengths of a broad range of service providers such as universities, non-governmental organizations (NGOs), public and the private sectors can contribute to publicly supported agricultural productivity operations.
- Evidence-based approaches with emphasis on data analysis, including economic factors and market orientation in policy development, priority setting and strategic planning for agricultural research, extension and training.

- Integration of agricultural research with extension services, the private sector, training, capacity building, and education programmes to respond in a holistic manner to the needs and opportunities for innovation in the sector.
- Explicit incorporation of sustainability criteria in evaluation of public investments in agricultural productivity and innovation programmes (fiscal, economic, social and environmental).
- Systematic utilization of improved management information systems, in particular for planning, financial management, reporting, and monitoring and evaluation.
- Introduction of cost-sharing with end-users, according to their capacity to pay, to increase their stake in the efficiency of service provision and to improve financial sustainability.
- Integration of gender considerations at all levels, including farmers and farmers' organisations, the private sector, public institutions, researchers and extension staff.

3.3 Agricultural Research Approaches and Methods

It is a widely held view that science and innovations are critical in agricultural development. Comparisons of the research system of the developed and developing countries indicate limited capacity in the developing countries for demand-led research institutions with adequate linkage to non-scientific agents of change. It has become clear that nations with strong scientific capacity, well-developed small and medium enterprises and infrastructure have been able to achieve rapid agricultural and economic development.

Sierra Leone has huge agricultural potential and could command a substantial share of the sub regional, regional and global markets if this potential is exploited well. Exploitation of this potential is, however, dependent greatly on the capacity of its agricultural research to innovate and generate knowledge and technologies which can be turned into goods and services able to compete effectively in the sub regional, regional and global markets.

3.3.1 Traditional and Farming Systems Approach

The traditional approach to agricultural research was mainly supply-driven. Researchers set the research agenda without consulting clients and other stakeholders. Up to the 1960s, most research efforts tended to be largely commodity and factor oriented. The underlying paradigm is that understanding of the whole comes from understanding of the parts and their interactions. This paradigm works well especially where interactions among the parts are not important, that is, where the whole is essentially the sum of the parts. However, work done with farmers in many parts of the world has shown that they operate complex farming systems and they have to make difficult decisions about adoption of technologies. Because if this complexity of the farming systems, the traditional approach, often referred to as the top-down approach, to agricultural research and development was not having an impact on small-scale agriculture.

Analysis of complex farming systems under which farmers operate led to the conclusion that appropriate technology could only be developed if it was based on full knowledge of the existing farming system, and that technologies should be evaluated not only in terms of their technical performance in specific environments, but also in terms of their conformity with the objectives, capabilities and socioeconomic conditions of clients. As a result, research and development practitioners looked for alternative approaches to agricultural research and development. The outcome was an approach which came to be known as Farming Systems Approach (FSA) defined as "a multi- (inter- and intra-) disciplinary approach to generation and diffusion of knowledge and technologies for specific target groups of clients with their participation focusing on identified priority problems, constraints and opportunities of the production system under consideration under different biophysical and socioeconomic conditions, with emphasis on improving the productivity of the existing system".

From the definition, FSA is holistic and participatory, multi- and -interdisciplinary, demand-driven and problem-solving. It promotes partnerships and linkages, as well as synergies and cost-effectiveness in research and development. While FSA transformed the way research was conducted, its participatory nature was limited to incorporation of farmers and did not permeate research institutions that continued to operate singly. The FSA emphasis also remained at the farm level addressing production oriented issues with little attention directed at research on the other aspects such as processing and marketing.

3.3.2 Agricultural Innovation Systems Approach

This emerged at the end of the 1990s and draws on the concept of a "national system of innovation". The framework was developed after the realisation that the objective of agricultural technology innovation must shift from increasing outputs and yields to transforming agriculture into a more responsive, dynamic and competitive sector. This shift was triggered by the emergence of major structural changes in the global food and agricultural systems including the integration of agriculture into global markets, the emergence of consumers as key drivers of technological change, the growth of private investment in new agricultural technologies, and the revolution in information and communication technologies combined with the growing recognition that agricultural innovation is far more complex and less linear than once believed.

In Agricultural Innovation Systems (AIS), heterogeneous actors interact in the generation, exchange and use of information and knowledge; individuals and organizations in the system learn and change; and social and economic institutions condition these interactions and processes. The concept embraces not only the science suppliers but the totality and interaction of actors involved in innovation. It includes the farmer as part of a complex network of heterogeneous actors engaged in innovation processes, along with the formal and informal institutions and policy environments that influence these processes.

In effect, this framework represents a move away from a more linear interpretation of innovation as a sequence of research, development and dissemination, to an interpretation that recognizes innovation as a complex web of related individuals and organizations, notably private industry and collective action organizations, all of whom contribute something to the application of new or existing information and knowledge.

The concept of agricultural innovation systems can be summarized by at least ten basic principles that include Focus on innovation rather than production; Interaction and learning; Linkages for accessing knowledge and learning; Broad spectrum of actors with new actors and new roles in the innovations process; Attitudes, practices and interaction of behavioural patterns that determine the propensity to innovate; The importance of policies in innovations; The inclusion of stakeholders and the demand side in the innovations process; Experiential learning and capacity building; Changing to cope with change; and Coping with "sticky" information that is local and specific to owners and not easily available to others.

3.3.3 Integrated Agricultural Research for Development Approach

A growing awareness amongst rural development practitioners of a need for "new and alternative ways of doing business" has created an increased demand for capacity development in how teams and partnerships are formed, plan, operate and are managed. This search for an alternative integrated innovation process has lead to the development of Integrated Agricultural Research for Development (IAR4D) approach. The IAR4D approach emerged after it was realised that the advances in research through the integrated pest management (IPM), integrated soil fertility management (ISFM) and integrated natural resource management (INRM) approaches offered an alternative approach for integrated research, although they fell short of integrating policies and markets, among others, into the research process. The IAR4D approach sets out a process and progressive procedures and accompanying tools for planning the resolution of complex problems and implementing rural development activities that respond to the needs of beneficiaries and involved stakeholders, contribute to broad development objectives and that use multi-dimensional participatory and systems approaches.

The IAR4D is a process-oriented approach that recognizes the need for collective action by involving a broad range of stakeholders and multiple knowledge sources including indigenous knowledge and technology that can be used to address complex development challenges. The IAR4D approach also recognizes both spatial and temporal scales and interdependencies; multiple effects and trade-offs of different options; and the need to involve a wide range of stakeholders often with conflicting interests in collective action. Equally important is the inclusion of the social component including negotiation between differing perspectives, policy formulation, institutional change and development, land use and planning, and conflict and information management.

The need to break away from unidisciplinary and conventional research approaches and instead focus more holistically on the context (social, ecological, economical and

institutional) which determines success and failure in achieving impact required a range of actions, the most important of which include (i) Facilitating more engagement of farmers and other participants in production to consumption chain; (ii) Enabling farmers to access efficiently functioning agricultural output and input markets; and (iii) Providing support to smallholders and pastoralists to engage in knowledge intensive integrated management of their natural resources and achieve sustainable improved livelihood. In order to achieve the desired results, these services are to be achieved in an integrated manner with closer interactions and more wide ranging partnerships between and within research institutions, other public, private and civil society organizations.

An Innovation Platform (IP) forms the core of the IAR4D structure. The IP is an informal coalition, collaboration, partnership and alliance of agricultural research for development actors, that is, public and private scientists, extension workers, representatives of farmers, farmers' associations, private firms and NGOs, and government policy makers who communicate, cooperate and interact to set priorities, develop concepts and plans to promote agricultural productivity and profitability. The core competencies brought to bear by IP are greater than the sum of IP's constituents acting independently.

The implementation of IAR4D hinges on four interactive process oriented support pillars namely (i) bringing about organizational and institutional change, capacity building for project teams and institutions; (ii) knowledge management and information sharing; (iii) monitoring, evaluation, impact assessment and lesson learning; and (iv) change and integration of markets, policies, NRM and productivity into innovation processes.

The impact pathway for IAR4D begins with the establishment of IP where priorities that would determine the objectives of the research are agreed upon, a concept and plan of action developed and roles of each actor or groups of actors on the platform are clearly defined. The research process would then involve the use of inputs which is further broken into three phases as follows:

(i) Identification of a common challenge through the IP and using inputs through an action research process to generate outputs in accordance with the project's priorities and objectives.

(ii) Innovation stage which involves development of processes to deliver the outputs to beneficiaries (putting research into use, sometimes referred to as the innovation process). This involves putting into use the outputs generated by the research process. This process is facilitated by the IP and leads to incremental changes in relationships and behaviour of stakeholders, in particular the users of the research outputs.

(iii) Out-scaling by using agricultural development processes leading to improved food security, income, livelihood assets, the natural resource base and resilience to shocks; that is, impact. The mandate of IP actors ordinarily stretches beyond the IAR4D site. Accordingly, these actors serve as agents for out-scaling the research approach and its outputs beyond the initial site.

3.4 Strategy for Responding to the Agricultural Sector Development Challenges

Agriculture has remained as the engine of the national economy whose performance impacts heavily on nearly all other sectors. It is the mainstay of the national economy and provides the basis for the development of the other sectors. By contributing raw materials to the manufacturing/industrial sector, the agricultural sector has a definite role in Sierra Leone's progress towards becoming a food secure and newly industrialized country. For the agricultural sector to improve on its contribution to the overall goal of national economic growth, wealth creation, food security and poverty alleviation, the agricultural sector must be transformed from subsistence to a commercial and profitable business enterprise.

In order to position itself strategically as a key driver in the transformation of the agricultural sector from subsistence to a commercial and profitable business enterprise, SLARI has adopted the Agricultural Product Value Chain (APVC) approach to research for development within the framework of Integrated Agricultural Research for Development and the Agricultural Innovation Systems approaches. The adoption of this approach to research requires SLARI to shift focus from production of commodities to differentiated agricultural products including increased value-addition to commodities within the rural areas and development and promotion of new products that fit the demands of the target market.

The adoption of the APVC approach to research for development has been necessitated by the renewed focus on agriculture and agribusiness as priority sectors for spurring economic growth in Africa with calls for development of APVCs that integrate producers and markets to make the agricultural sector more responsive to consumer demands. An important feature of the APVC approach is that it permits analysis of the whole product system leading to the identification and prioritization of opportunities and problems throughout the system which facilitates the development of more realistic research and development intervention projects. The APVC approach achieves this by bringing many concepts, instruments and techniques together in one process and presents them as an integrated whole.

In addition to this, the APVC approach to research for development implies expansion of the research portfolio to components such as post-harvest processing, marketing and internalization of consumer needs. The approach involves working with all players along the different APVCs from resources, production, processing, marketing to consumption. The APVC approach is characterized by increased vertical coordination of many actors and would be expected to demand for more integration and coordination of all different service providers around priority APVCs. The APVC approach gives new insights into globalization and has implications on improved agricultural productivity and poverty reduction. Building on market opportunities, the approach targets the growth potential directly and provides a framework for analyzing institutional, technical and social constraints with a view to deriving strategies for commercialization and to foster pro-poor growth.

In an agricultural value chain, agricultural research and development institutions contribute to knowledge, technologies, practices and services required along the value chain to produce and deliver a product or service. Community associations, clients' organizations and trade associations have a role in improving coordination among actors in a value chain and in communicating the needs of the industry to government. The associations and organizations can help organize production, negotiate contracts, improve market information systems, promote products, coordinate research, and enforce quality standards and pool risks. A major opportunity is that the poor can participate in these arrangements and capture the benefits from new markets.

3.5 Institutional Strategic Focus

SLARI is mandated to implement the agricultural policies and strategies of the Government of Sierra Leone (GoSL). It is also supposed to spearhead the implementation of CAADP Pillar IV in Sierra Leone. In view of this, the SLARI Vision and Mission statements confirm the Institute's commitment to the national, sub regional and regional policy and priorities aimed at creating economic development through agriculture and meet the Millennium Development Goals of reducing poverty and eradicating hunger.

3.5.1 The Strategic Vision

The SLARI guiding Vision that requires the Institute and its stakeholders and partners to stretch their future expectations, aspirations and performance is to see "**Improved and sustainable broad-based agricultural growth".**

3.5.2 The Mission Statement

The Mission statement that expresses the fundamental purpose and business of SLARI is **"To enhance sustainable productivity, commercialization and competitiveness of the agricultural sector through generation and promotion of innovative agricultural technologies and empowerment of stakeholders"**.

3.5.3 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.

3.5.4 Objective Statements

(a) General Objective

The SLARI General Objective is **"To enhance sustainable productivity, commercialization and competitiveness of the agricultural sector**". This General Objective indicates that SLARI is committed to making significant contribution to the CAADP goal of agricultural growth. The General Objective is also coherent with sub regional and regional strategies and is broad-based to ensure that all priority areas are included and that no potential stakeholder groups shall be excluded.

(b) Specific Objective

The Specific Objective which SLARI is expected to achieve is **"Generation and promotion of innovative agricultural technologies and empowerment stakeholders"** This Specific Objective is derived from the business part of its Mission statement and is coherent with the CAADP and the Strategic Plans/directions of Conseil Ouest et Centre

Africain pour la Recherche et le Développement Agricoles/West and Central African Council for Agricultural Research and Development (CORAF/WECARD) and the Forum for Agricultural Research in Africa (FARA). The Specific Objective has been developed in a manner that facilitates cascading to the lower levels but reduced in scale and scope at each level so as to ensure better outcome mapping and impact orientation as shown in Figure 3.1.

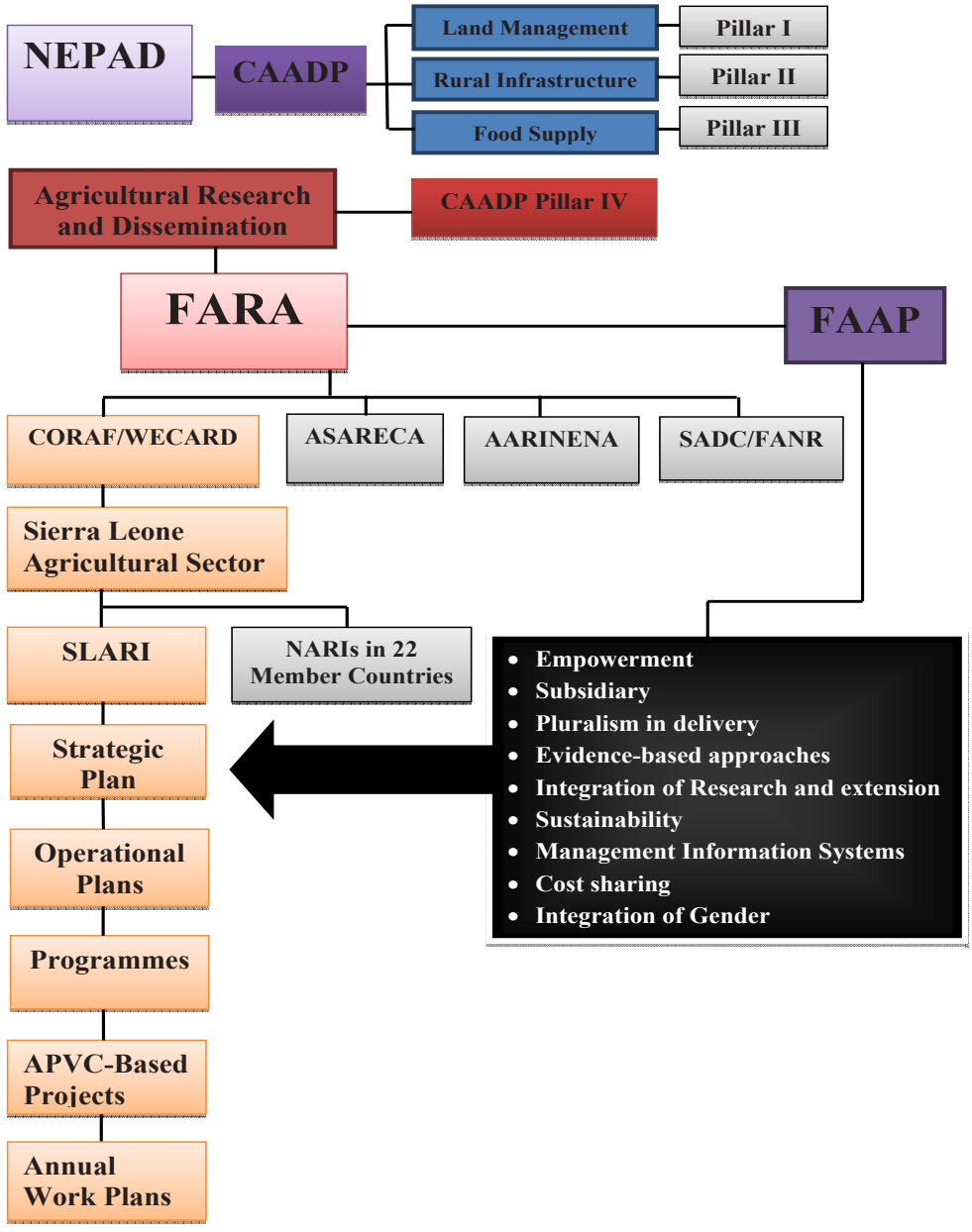

Figure 3.1: Relationship between CAADP, FARA, FAAP, CORAF/WECARD and SLARI planning process and plans

3.6 Institutional Level Results

Given the institutional strategic focus, SLARI has identified five result areas that are necessary and sufficient to deliver on the institutional Specific Objective. Attainment of this Specific Objective will contribute significantly to the realization of the overall Institute's General Objective. The results are designed to position SLARI strategically as the key driver for enhancing productivity, commercialization and competitiveness of the agricultural sector. The five necessary and sufficient results are as shown in Table 3.1.

Table 3.1: SLARI institutional level results

Results	Statement
Result 1	Appropriate agricultural product value chains technologies and innovations **generated and promoted.**
Result 2	Appropriate markets and marketing strategies for enhancing agricultural product value chains **developed and promoted.**
Result 3	Appropriate policy options for enhancing agricultural product value chains **facilitated and advocated.**
Result 4	Capacity for implementing agricultural product value chains research **strengthened.**
Result 5	Appropriate mechanisms for managing, sharing and up scaling agricultural knowledge, information and technologies **established and operationalized.**

3.7 Strategic Research Areas of Focus

SLARI has recognized the limitations of organizing research according to disciplines that tend to result into programmes that are too academic. Following this realization, SLARI has adopted a programme approach to its research planning and management. In view of this and considering the need to ensure effective delivery of the five institutional level results, research operations in SLARI have been rationalized into seven long-term strategic research programme areas of focus. Administratively, the research programme areas of focus corresponds to the seven research centres that constitute SLARI. The research programme areas of focus express a stronger organizational commitment to impact as the strategic orientation and positioning of SLARI as a leader in the generation and promotion of innovative agricultural technologies and stakeholders empowerment aimed at increasing productivity, commercialization and competitiveness of the agricultural sector.

Although the research programme areas of focus shall be carried out at different research Centres, they are considered as integrally linked rather than as isolated areas of research. In operational terms, there will be overlaps and this is desired since Integrated Agricultural Research for Development seeks to deal with issues in a holistic manner. In other words, product value chains in crops and livestock will not be tackled without also considering the institutional and natural resource management aspects and their interactions. There is, therefore, no order of priority in the research programme areas of focus.

Each of the research programme areas of focus shall be expected to contribute to the attainment of the five institutional level results. To do this in the most effective and efficient manner, each of the research programme areas of focus shall be expected to deliver on five results similar to those at the institutional level but reduced in scale and scope to the specific research programme area of interest for better outcome mapping and impact orientation. The necessary and sufficient research programme areas of focus required to deliver the institutional level results leading to increasing productivity, commercialization and competitiveness of the agricultural sector and their respective coordinating and implementing research centres are as shown in Table 3.2.

Table 3.2: SLARI research programme areas of focus and their respective coordinating and implementing research centres

Research Programme Area of Focus		Coordinating and Implementing Research Centre
1.0	Root, Tuber and Grain Legume Crops Programme	Njala Agricultural Research Centre (NARC)
2.0	Cereal Crops Programme	Rokupr Agricultural Research Centre (RARC)
3.0	Horticultural Crops Programme	Kabala Horticultural Crops Research Centre (KHCRC)
4.0	Livestock Programme	Teko Livestock Research Centre (TLRC)
5.0	Fisheries Programme	Freetown Fisheries Research Centre (FFRC)
6.0	Forestry and Tree Crops Programme	Kenema Forestry and Tree Crops Research Centre (KFTCRC)
7.0	Land, Water and Environment Programme	Magbosi Land and Water Research Centre (MLWRC

3.8 Selection and Prioritization of Agricultural Product Value Chains

In SLARI, priority setting shall be a pre-requisite to the formulation of sound proposals. The setting of the research priorities shall be guided by the country's development goals as outlined in the national policies and plans and the resources available to undertake activities within a specified timeframe. The priority setting in SLARI shall, therefore, be the process of choosing the best options among a set of potential research alternatives. The primary objective of the rigorous priority setting process shall be to make the most effective use of the resources available for research. The priority setting process shall also be expected increase the credibility of the final outcome to stakeholders and to the outside world. This shall, in turn, improve the Institute's position in negotiations with the country treasury, development partners and research partners.

Currently, SLARI has very limited human, financial and physical resources and, therefore, only few product value chains under each research programme area of focus can be developed and promoted. In view of this, SLARI research managers together with the relevant agricultural sector stakeholders will have to make a choice on those product value chains that have the greatest potential contribution to the national economic growth and agricultural sector development. To do this, SLARI shall need to identify an appropriate priority setting methodology for use in the identification and selection of the most important product value chains for development and promotion under each research programme area of focus. The result of this priority setting process shall be expected to form the basis for allocation of resources for research. The use of this formal priority setting process in the identification and selection of product value chains for development and promotion shall be expected to:

- Bring the key actors that have a stake in the decision together thereby reducing the chance of personal bias.
- Build decisions on actual evidence rather than on subjective assumptions.
- Ensure clear and concrete thinking on what really matters.
- Build consensus on objectives as differences of opinions are clarified.
- Provide clarity and transparency to planners and other stakeholders.
- Improve the quality of thinking and of the decisions made.

4.0 RESEARCH PROGRAMME AREAS OF FOCUS

4.1 Introduction

Research programming is the process by which policy, priorities and thrusts in research are translated into programmes of research of short-, medium- and long-term durations. Research programming, therefore, moves the concept of what research could do from the levels of the general (concepts, directions and emphasis) to the specific (problems, experiments and studies) as are appropriate in addressing the constraints to agricultural productivity and production. Although programming is supposed to be specific and mainly a bottom-up approach, it takes account of and involves the continuum in both directions from the national policy level to institutional level and from institutional level to the national policy level.

Research programming is, therefore, such a critical element in the planning and implementation of national research and development priorities that unless it is properly and competently undertaken, an apparently well-organized system with adequate resources may be less productive and ineffective in terms of the generation and dissemination of improved materials and technologies for the benefit of clients of the research system. Many studies have identified many deficiencies in research programming in many research institutions in developing countries which make them less effective in the generation and promotion of demand-driven knowledge, information and technologies required by different agricultural sector clients.

In order to streamline and refocus the research programming process, research and development in SLARI has been rationalized into seven research programme areas of focus that include (i) Root, Tuber and Grain Legume Crops programme; (ii) Cereal Crops Programme; (iii) Livestock Programme; (iv) Forestry and Tree Crops Programme; (v) Horticultural Crops Programme; (vi) Fisheries Programme; and (vii) Land, Water and Environment Programme. This chapter goes further to elaborate on each research programme area of focus in terms of its rationale and justification; the challenges and constraints facing each research programme area of focus; and the strategic focus to be followed in order to address the identified challenges. Attainment of the purpose for each research programme area of focus shall be expected to lead to enhanced productivity,

commercialization and competitiveness of each research programme product value chains. This shall in turn be expected to contribute significantly to the improvement of livelihoods, income generation and food security leading to sustainable agricultural sector development and national economic growth.

4.2 Root, Tuber and Grain Legume Crops Programme

4.2.1 Rationale and Justification

Root, tuber and grain legume crops play a major role in poverty alleviation and improved livelihood for millions of Sierra Leoneans complimenting rice as the major staple food crop. They are widely grown and well-adapted into the farming system. The agricultural sector in Sierra Leone employs more than 70% of the rural population and contributes 50% of the country's Gross Domestic Product (GDP). Crops within this sector, especially cassava, have been identified as important with the potential of contributing to the achievement of the millennium development goal of poverty reduction as well as meeting requirement of the Pillar II in the poverty reduction strategy paper in Sierra Leone. Root, tuber and grain legume crops fit in well with the recently launched small-scale commercialization programme by the Government of Sierra Leone and focus on value addition, product development and marketing. This provides an opportunity for import substitution and savings in foreign exchange. This is in line with the Mission of SLARI of enhancing sustainable productivity, commercialization and competitiveness of the agricultural sector through generation and promotion of innovative agricultural technologies and empowerment of stakeholders. However, poor soils, weeds and pests and diseases greatly reduce the potential of these crops in quality and quantity.

Despite the long history of agricultural research in Sierra Leone, crop yields still remain low and have failed to improve the livelihoods of millions of resource poor farmers who constitute 70% of the working population. Due to low productivity owing to poor policies and strategies, poor feeding and care practices, poor generation, dissemination of technologies and preservation of Indigenous Technical Knowledge (ITK) chronic malnutrition prevails. Therefore an efficient and productive national research system

that will conduct research for development in roots, tubers and grain legumes within the IAR4D framework remains the most viable option in meeting the country's development objectives and the MDGs in reducing poverty by half by 2015

4.2.2 Challenges and Constraints

Despite increases in crop production following cessation of hostilities in Sierra Leone, farmers continue to experience low yields in crop yields due to declining soil fertility and low adoption of research technologies. Farming in Sierra Leone is rain fed and cultivation in the dry season remains a challenge due to unavailability of irrigation systems despite the presence of nine major rivers. Malnutrition, especially among children under five years, and lactating mothers is prevalent among the farming community. Lack of appropriate policies, standards for food products, marketing opportunities, limited stakeholder involvement in the cassava value chain poses serious challenges to agricultural development in Sierra Leone. Pests and diseases, limited infrastructure, inadequate research capacity, limited access to current and relevant scientific literature, inadequate support services and logistics are also constraints in increasing the productivity of the root tuber and grain legume sub sectors.

Promotion of root and tuber crops and grain legumes such as cowpea, pigeon pea and soybean as food supplements and beta carotene derived from yellow rooted cassava and orange-fleshed sweet potato are also vital in improving the health status of the farming community. The programme aims at developing, validating and releasing technologies to the value chain players. Strategies that will be adopted include breeding of superior varieties through the use of biotechnology and molecular marker-assisted selection, a faster means of providing farmers with high yielding varieties of crops with the desired agronomic traits, value adding at pre- and post- harvest levels and identifying alternative uses which integrate crop and livestock farming thus reducing the cost of production. Increased productivity will be achieved through modernizing agricultural production and marketing systems by promoting tractorization, enhancing use of agro-chemicals and high quality seeds/planting materials and farmer organization to achieve volumes and economies of scale and linkage to markets. The programme will contribute to the development of appropriate policies to promote, production, processing and consumption of agricultural products in the bakery and confectionary industry as well as in food diversification. Participatory approaches in Innovation Platforms to Technology Adoption (IPTA) and an appropriate agricultural information system (AIS) and ICT systems will be vital in addressing issues of increased productivity, food security and wealth creation.

Policy constraints to the development of the root and tuber crops and grain legumes sub sectors have slowed down the growth of this sub sector. Therefore, conducting studies on such constraints and any opportunities will provide information that will form the basis for advocacy for policy reform. Analysis of the influence of constraints, such as the lack of protocols for release of new varieties and seed regulations of root and tuber crops, will offer sufficient data to address the current restrictions.

4.2.3 Strategic Focus

The Root, Tuber and Grain Legume Crops Programme is coordinated and implemented by the Njala Agricultural Research Centre (NARC). The Programme is expected to **enhance sustainable productivity, commercialization and competitiveness of the root, tuber and grain legume crops**. In order to do this, the Programme is expected to contribute to the delivery of the overall institutional purpose through the attainment of its purpose of **Generating and promoting innovative root, tuber and grain legume crops technologies and empowerment of stakeholders.** The Programme shall deliver this purpose through the attainment of the following five strategic results:

(i) Appropriate root, tuber and grain legume crops product value chains technologies and innovations **generated and promoted.**

(ii) Appropriate markets and marketing strategies for enhancing root, tuber and grain legume crops product value chains **developed and promoted.**

(iii) Appropriate policy options for enhancing root, tuber and grain legume crops product value chains **facilitated and advocated.**

(iv) Capacity for implementing root, tuber and grain legume crops product value chains research **strengthened.**

(v) Appropriate mechanisms for managing, sharing and up scaling root, tuber and grain legume crops knowledge, information and technologies **established and operationalized.**

In order to contribute significantly to the attainment of the overall institutional purpose, the Root, Tuber and Grain Legume Crops Programme shall focus on nine product value chains outlined below. The importance of each product value chain in contributing to the national economic growth and agricultural sector development as well as improvement of livelihoods, income generation and food security shall be determined through prioritization process discussed in chapter three. The allocation of resources for research shall then be based on the results of the priority setting process. Each of the intervention strategies to be carried out under each product value chain shall be expected to contribute to the attainment of the five Programme strategic results.

(i) Development and promotion of Cassava product value chain.

(ii) Development and promotion of Yam product value chain.

(iii) Development and promotion of Sweet Potato product value chain.

(iv) Development and promotion of Irish Potato product value chain.

(v) Development and promotion of Cocoyam product value chain.

(vi) Development and promotion of Cowpea product value chain.

(vii) Development and promotion of Soybean product value chain.

(viii) Development and promotion of Pigeon Pea product value chain.

(ix) Development and promotion of Groundnut product value chain.

4.3 Cereal Crops Programme

4.3.1 Rationale and Justification

Cereals are among the main source of energy and account for more than 50% of agricultural production in Sierra Leone. More than 70% of the farming population is engaged in cereal production of which rice is the major staple food crop. While cereals form an important component of the nutrition of Sierra Leoneans, production levels are currently low. Rice is the most important cereal in Sierra Leone. The area under production in 2007 was 659,487 ha which produced 637,983 metric tonnes of paddy at the average yield of one tonne per hectare. The other cereals of importance in the country include maize, sorghum, millet and *Digitaria* (Fundi). Most of these cereals are grown as rain fed or dry season crops after rice, and fit into the low input farming systems of resource limited farmers because of their ability to withstand drought and tolerate poor and marginal soils. Approximately 17,000 ha of land are currently under maize production and 23-35,000 ha under sorghum. Increasingly there is a growing demand for these crops especially sorghum and *Digitaria* for industrial processing apart from being food for the rural populations.

The production of rice and other cereals remain insufficient to meet the total consumption requirements at the national level. The country continues to import large quantities of these crops to address the national requirements. Addressing this deficit requires improving production of these crops through development and adoption of improved technologies including varieties. Of importance are the various initiatives by the Government to increase production of cereal crops. Key among them is the West Africa Agricultural Productivity Programme that focuses on various food crops and specifically which aims at increasing rice production from the current levels of 637,983 to 3,100,000 metric tonnes by 2018. In light of the growing urban and rural populations and the associated demands for food and industrial raw material, there is need to enhance productivity of the cereal sector thereby contributing positively to improved livelihoods, food-self-sufficiency and food security.

4.3.2 Challenges and Constraints

Enhancing productivity of cereal crops in Sierra Leone is a challenge. The low productivity is attributed to among others, the poor quality and high cost of inputs and inappropriate policies on cereal investment. In addition, inappropriate production practices by farmers due lack of awareness or low adoption of improved technologies and lack of access to credit, has further hampered the growth of this sub sector. Lack of suitable varieties with desirable traits and established seed systems to service the industries have been a major bottleneck. Apart from rice, there has been limited research in the development of appropriate technologies and crop varieties. Disease incidence and pest infestation, and soil infertility have further exacerbated production. Poor infrastructure and markets; limited value addition and a result a narrow product range; and inadequate marketing strategies have acted as disincentives for investment in cereal sub sector.

To enhance production, the research thrust will focus on the development of appropriate varieties that are high yielding and tolerant to pests. Appropriate integrated pest management strategies will be developed and disseminated to farmers, and efforts will also focus on the development of post-harvest practices, creating opportunities for processing and value addition to improve access to markets. In addition, collaboration with other stakeholders shall enhance the development of effective extension messages and participation in dissemination of relevant information. Improvements in the human resource and physical infrastructure will be necessary to enhance capacity for research and development of technologies.

4.3.3 Strategic Focus

The Cereal Crops Programme is coordinated and implemented by the Rokupr Agricultural Research Centre (RARC). The Programme is expected to **enhance sustainable productivity, commercialization and competitiveness of the cereal crops.** In order to do this, the Programme is expected to contribute to the delivery of the overall institutional purpose through the attainment of its purpose of **Generating and promoting innovative cereal crops technologies and empowerment of stakeholders.** The Programme shall deliver this purpose through the attainment of the following five strategic results:

(i) Appropriate cereal crops product value chains technologies and innovations **generated and promoted.**

(ii) Appropriate markets and marketing strategies for enhancing cereal crops product value chains **developed and promoted.**

(iii) Appropriate policy options for enhancing cereal crops product value chains **facilitated and advocated**

(iv) Capacity for implementing cereal crops product value chains research **strengthened.**

(v) Appropriate mechanisms for managing, sharing and up scaling cereal crops knowledge, information and technologies **established and operationalized.**

In order to contribute significantly to the attainment of the overall institutional purpose, the Cereal Crops Programme shall focus on six product value chains outlined below. The importance of each product value chain in contributing to the national economic growth and agricultural sector development as well as improvement of livelihoods, income generation and food security shall be determined through prioritization process discussed in chapter three. The allocation of resources for research shall then be based on the results of the priority setting process. Each of the intervention strategies to be carried out under each product value chain shall be expected to contribute to the attainment of the five Programme strategic results.

(i) Development and promotion of Upland Rice product value chain.
(ii) Development and promotion of Lowland Rice product value chain.
(iii) Development and promotion of Maize product value chain.
(iv) Development and promotion of Sorghum product value chain.
(v) Development and promotion of Pearl millet product value chain.
(vi) Development and promotion of Digitaria product value chain.

4.4 Horticultural Crops Programme

4.4.1 Rationale and Justification

The horticulture sub sector comprises vegetables (80%), fruits (18%) and flowers (2%) that are consumed locally. Horticultural crops play an important role in contributing to nutrition needs and income generation for the urban and peri-urban producers and the rural farmers in the Western Area and Northern Province. Commercial producers grow up to three cycles all year round. These crops are important commodities for poor households because they are relatively easy to produce and are inexpensive compared to other foods. Apart from meeting the household food needs, horticultural crops including citrus can be processed into diverse products such as juice, jam, jelly and desiccated fruit which are important products for urban centres. Among the horticultural crops, ginger, plantain and chilli pepper have a large potential for export and have therefore been prioritized for promotion in various districts as per their competitive advantage. Currently, the only horticultural crop exported is ginger.

The demand for horticultural crops, especially fruits and vegetables, in Sierra Leone is on the rise. There is an unsatisfied demand for these crops especially in urban areas due to increasing urbanization by the local people and foreigners who are demanding for a greater assortment of horticultural products from the markets. This, therefore, presents opportunities for enhancing productivity of horticultural crops to be able to meet the market demands.

4.4.2 Challenges and Constraints

The horticulture industry in Sierra Leone is still in its infancy, therefore production is very low. Production of horticultural crops is constrained by the limited research to support this industry; unavailability of quality planting material which is a prerequisite to production of high quality products; poor quality and high costs of agricultural inputs; and poor agronomic practices and pests and diseases. Insufficient awareness on production technologies and lack of entrepreneurial skills among small-scale growers has contributed to low productivity. Land tenure remains a challenge that needs to be addressed speedily especially in the urban, peri-urban and rural areas due to the lengthy bureaucratic processes. The need to commercialize the production of horticultural crops, therefore, requires the development and or introduction of superior varieties and technologies that are adaptable to various environmental conditions of the farmers' fields.

The development of vibrant agro-industries based on exotic and indigenous horticultural crops has not received due attention, with most products sold fresh, thereby fetching low incomes for farmers/clients in the horticulture value chains. The poor infrastructure limits product development and diversification. In addition, the food safety and processing and product standards are not available nationally for most horticultural crops. There is need for the development and institutionalization of these standards in order to promote trade in the region and internationally. Ineffective standard bureau in dealing with horticultural crops is also a major challenge

4.4.3 Strategic Focus

The Horticultural Crops Programme is coordinated and implemented by the Kabala Horticultural Crops Research Centre (KHCRC). The Programme is expected to **enhance sustainable productivity, commercialization and competitiveness of the horticultural crops.** In order to do this, the Programme is expected to contribute to the delivery of the overall institutional purpose through the attainment of its purpose of **Generating and promoting innovative horticultural crops technologies and empowerment of stakeholders.** The Programme shall deliver this purpose through the attainment of the following five strategic results:

(i) Appropriate horticultural crops product value chains technologies and innovations **generated and promoted.**

(ii) Appropriate markets and marketing strategies for enhancing horticultural crops product value chains **developed and promoted.**

(iii) Appropriate policy options for enhancing horticultural crops product value chains **facilitated and advocated.**

(iv) Capacity for implementing horticultural crops product value chains research **strengthened.**

(v) Appropriate mechanisms for managing, sharing and up scaling horticultural crops knowledge, information and technologies **established and operationalized.**

In order to contribute significantly to the attainment of the overall institutional purpose, the Horticultural Crops Programme shall focus on seven product value chains outlined below. The importance of each product value chain in contributing to the national economic growth and agricultural sector development as well as improvement of livelihoods, income generation and food security shall be determined through prioritization process discussed in chapter three. The allocation of resources for research shall then be based on the results of the priority setting process. Each of the intervention strategies to be carried out under each product value chain shall be expected to contribute to the attainment of the five Programme strategic results.

(i) Development and promotion of Indigenous Vegetables product value chains.
(ii) Development and promotion of Exotic Vegetables product value chains.
(iii) Development and promotion of Herbs and Spices product value chains.
(iv) Development and promotion of Tropical Fruits product value chains.
(v) Development and promotion of Temperate Fruits product value chains.
(vi) Development and promotion of Indigenous Fruits product value chains.
(vii) Development and promotion of Ornamental and Medicinal Plants product value chains.

4.5 Livestock Programme

4.5.1 Rationale and Justification

Sierra Leone has an estimated livestock population of 2,049,364 comprising of 517,000 cattle, 682,000 sheep, 803,000 goats, and 47,364 heads of pigs; while poultry population is estimated at 9,460,000 against a human population of 5,000,000 people (GoSL, 2010). Apart from the conventional livestock, other livestock species that include rabbits, cane rats, snails and guinea hens play an important role in provision of food.
The Livestock sub sector has the lowest share in the agricultural GDP contributing only about 3% compared to crops (62%), fisheries (23%) and forestry (10%). The current modest contribution of the sub sector to agricultural GDP is due to the depletion of livestock during the ten-year-long war, which resulted in the destruction of more than 70% of the national herd. This is further exacerbated by the long generation interval typical of certain classes of livestock especially cattle. However the potential for livestock in Sierra Leone is enormous. Nationally, about 80% of households own some form of livestock, which have potential to contribute to the provision of food and nutrition security, income, employment creation, traction and nutrient cycling. The low protein intake of 44 g stated in Vision 2025 can be improved through increased production of livestock. Livestock also plays an important role socio-culturally in bonding communities in form of dowry and in ceremonies and can also act as a bank.

Currently, the livestock industry is dominated by meat production mainly from indigenous breeds of cattle, sheep, goats and poultry. The predominant breed of cattle is N'Dama, which weighs 250-350 kg at 5-6 years of age. Milk production is also from the same indigenous N'Dama breed with production levels of not more than 5 litres per cow per day. The West African Dwarf goats and Djallonke sheep breed, which also exhibit low mature weight, make the bulk of the small ruminant population, while poultry is dominated by local breeds with slow growth rates and low egg production. Thus, the current low contribution of livestock to agricultural GDP (3%) is due to low livestock populations and productivity per unit, creating a huge deficit between supply and demand that is filled through imports especially of powdered milk and poultry meat.

The increasing population estimated at 15% between 2010 and 2014 shall create increased demand for livestock and livestock products. Furthermore, the country can also exploit regional and international niche markets if the huge potential for livestock production in the country is fully exploited. Regional economic blocks such as Mano River Union (MNU) and ECOWAS are potential huge markets for livestock and livestock products which the country can exploit in future. However, currently the sub sector is unable to meet even the domestic demand.

4.5.2 Challenges and Constraints

The major challenge facing the livestock sub sector in Sierra Leone is how to increase supply of livestock and livestock products. This has been constrained by long dry seasons leading to temporary scarcity of forages, livestock diseases outbreaks, inferior genetic potentials of indigenous livestock, poor storage and processing facilities, inadequate access to knowledge and information technologies and extension services, weak technical manpower base, and lack of production facilities such as fencing and poultry houses among others. Currently, the production systems are not market-oriented and therefore the products are not competitive in domestic and external markets. The challenge, therefore, is provision of information and knowledge that will enhance productivity and empower producers to be market-oriented. Furthermore, limited value addition and product development will enable access to potential new market opportunities. In addition, certain policies governing the sub sector may not be conducive for increased growth hence the need for appropriate policies which will facilitate desired growth in the sub-sector.

Livestock are a major gateway out of poverty particularly for resource-poor rural farmers. However, disease outbreaks coupled with a weak animal health delivery services has exacerbated the already worsened situation. Animals still continue to succumb to preventable animal diseases such as Newcastle, Brucellosis and Blackquater resulting in huge losses to farmers. Transboundary diseases such as Avian Influenza are a major concern for public health and economics of farmers in Sierra Leone. Contagious Caprine Pleuro-Pneumonia (CCPP) and Contagious Ovine Pleuro-Pneumonia (COPP) are still major problems to contend with in Sierra Leone. Endemic diseases such as Anthrax, Haemorrhagic septicaemia, Trypanosomiasis, Leptospirosis, Babesiosis and Helminthiasis continue to inflict serious economic losses to farmers.

Animal health services are grossly incapacitated and short of trained and competent staff. There are less than five practicing veterinarians in the country and almost all of them may retire in the next five years. Post-conflict livestock restocking lead to exacerbated disease situation in the country. This is attributed to restocking of animals without due regard for basic principles of successful restocking. In addition, there are few Animal Health Extension staff and there is no opportunity to locally train them.
Another challenge in livestock production is land tenure (ownership and use) especially in the northern parts of the country dominated by the Fula ethnic group. These are nomadic pastoralists, most of whom have no land rights. This impedes investment in

land (and livestock) improvement. The free-range grazing system is often also a source of conflict between pastoral/herders and crop producers.

Most farmers in Sierra Leone are small-scale producers who do not have the capacity to use tractors in their farms. Also, it has been proved that inland valley swamps are more fertile than upland and the present trend is to encourage farmers to cultivate the lowlands. The use of tractors in inland valley swamps is not economical due to their sizes and the land preparation. The use of work oxen is, therefore, an appropriate technology. However, the use of oxen as a source of farm power is constrained by the lack of facilities for training, availability of ox-drawn equipment and the health and nutrition of the animals. In addition to these constraints, farmers are also not well trained on the technical aspects of exploiting oxen and adequately managing them to optimize their performance. The establishment of infrastructure and manpower requirements in remote inaccessible areas, where agricultural activities are active by resource-poor rural farmers who lack the basic finances status to hire tractors, is also another challenge.

4.5.3 Strategic Focus

The Livestock Programme is coordinated and implemented by the Teko Livestock Research Centre (TLRC). The Programme is expected to **enhance sustainable productivity, commercialization and competitiveness of the livestock sub sector**. In order to do this, the Programme is expected to contribute to the delivery of the overall institutional purpose through the attainment of its purpose of **Generating and promoting innovative livestock technologies and empowerment of stakeholders.** The Programme shall deliver this purpose through the attainment of the following five strategic results:

(i) Appropriate livestock product value chains technologies and innovations **generated and promoted.**

(ii) Appropriate markets and marketing strategies for enhancing livestock product value chains **developed and promoted.**

(iii) Appropriate policy options for enhancing livestock product value chains **facilitated and advocated.**

(iv) Capacity for implementing livestock product value chains research **strengthened.**

(v) Appropriate mechanisms for managing, sharing and up scaling livestock knowledge, information and technologies **established and operationalized.**

In order to contribute significantly to the attainment of the overall institutional purpose, the Livestock Programme shall focus on **seven** product value chains outlined below. The importance of each product value chain in contributing to the national economic growth and agricultural sector development as well as improvement of livelihoods, income generation and food security shall be determined through prioritization process discussed in chapter three. The allocation of resources for research shall then be based on the results of the priority setting process. Each of the intervention strategies to be carried out under each product value chain shall be expected to contribute to the attainment of the five Programme strategic results.

(i) Development and promotion of Dairy product value chain.
(ii) Development and promotion of Beef product value chain.
(iii) Development and promotion of Goat product value chain.
(iv) Development and promotion of Sheep product value chain.
(v) Development and promotion of Pig product value chain.
(vi) Development and promotion of Poultry product value chains.
(vii) Development and promotion of Non-conventional Small Stock product value chains.

4.6 Fisheries Programme

4.6.1 Rationale and Justification

The fisheries sub sector of Sierra Leone contributes significantly to food security and the national economy. The agricultural sector, defined to include forestry and fisheries, employs about two thirds of the working population. The full realization of the potentials of fisheries will go a long way in supporting Government's efforts for the recovery of the agricultural sector. This will translate into improved self-sufficiency in fish production, increased employment opportunities for nationals as well as increased revenue and foreign exchange earnings for the Government. The fisheries sub sector plays a significant role from a nutritional viewpoint because fish is a major source of animal protein. The fisheries sub sector contributes about 10% to the GDP. The current per capita fish consumption is about 25%, which is more than the regional average of 18%. The sector employs over 20,000 fishermen directly and about 150,000 persons indirectly in fish processing, distribution and associated trades. Over 70% of catches is landed by artisanal fishermen deploying a range of simple fishing gears in dugout canoes and small planked boats.

The country claimed a 200 mile Exclusive Economic Zone (EEZ) in the early 1980s in conformity with the United Nations Convention on the Law of the Sea. The total area of the EEZ extends to some 155700 km^2. Opportunities for fish harvest abound in the marine environment, inland water bodies and on the land itself through aquaculture

activities. The technology to harvest the fish and shellfish resources in the country's marine environment has evolved remarkably over the past decades. The technological development of the offshore industrial sector has, however, outpaced the still under-developed inshore small-scale sector. Great strides were made in the 1970s and 1980s to rationally harness the potential fish resources in inland waters, earthen ponds and enclosed marine areas (mariculture) which have impacted differently on the socioeconomic development of the country.

4.6.2 Challenges and Constraints

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.

The highly mechanized industrial fishery: 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. The number of licensed vessels peaked in 1987, with over 300 vessels, after which there has been a gradual drop. This drop was largely attributed to first, the collapse or break-up of the Soviet Union which resulted in the withdrawal of the Soviet vessels which at the time constituted about 60% of the total industrial fleet; and second the country's civil war which scared the vessels out of the area and causing prohibitive insurance premiums. The relatively large number of licensed purse seiners (for small pelagics) in the 1980s caused spectacular increase in industrial catches.

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. The fishery is conducted from 530 fishing landing sites in the country and creates direct employment for about 30,000 fishermen. About 200,000 additional jobs are provided by ancillary activities like fish processing, marketing, boat-building and engineering, with women playing major roles in the fish distribution channels. Over 100,000 metric tonnes of fish is produced yearly in this sector, becoming a major contributor to the enhancement of livelihoods in poor fisheries communities. 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.

4.6.3 Strategic Focus

The Fisheries Programme is coordinated and implemented by the Freetown Fisheries Research Centre (FFRC). The Programme is expected to **enhance sustainable productivity, commercialization and competitiveness of fisheries sub sector**. In order to do this, the Programme is expected to contribute to the delivery of the overall Institutional purpose through the attainment of its purpose of **Generating and promoting innovative fisheries technologies and empowerment of stakeholders.** The Programme shall deliver this purpose through the attainment of the following five strategic results:

(i) Appropriate fisheries product value chains technologies and innovations **generated and promoted.**

(ii) Appropriate markets and marketing strategies for enhancing fisheries product value chains **developed and promoted.**

(iii) Appropriate policy options for enhancing fisheries product value chains **facilitated and advocated.**

(iv) Capacity for implementing fisheries product value chains research **strengthened.**

(v) Appropriate mechanisms for managing, sharing and up scaling fisheries knowledge, information and technologies **established and operationalized.**

In order to contribute significantly to the attainment of the overall institutional purpose, the Fisheries Programme shall focus on eight product value chains outlined below. The importance of each product value chain in contributing to the national economic growth and agricultural sector development as well as improvement of livelihoods, income generation and food security shall be determined through prioritization process discussed in chapter three. The allocation of resources for research shall then be based on the results of the priority setting process. Each of the intervention strategies to be carried out under each product value chain shall be expected to contribute to the attainment of the five Programme strategic results.

(i) Development and promotion of Demersal product value chain.

(ii) Development and promotion of Pelagic product value chain.

(iii) Development and promotion of Shrimps product value chain.

(iv) Development and promotion of Crabs and Lobsters product value chains.

(v) Development and promotion of Cephalopodae product value chains.

(vi) Development and promotion of the Tilapia product value chain.

(vii) Development and promotion of Shrimp Culture product value chain.

(viii) Development and promotion of Catfish product value chain.

4.7 Forestry and Tree Crops Programme

4.7.1 Rationale and Justification

Sierra Leone covers an area of 7.2 million ha of which nearly 5.4 million ha is arable with cash crops and food crops grown in the arable uplands. Nearly 6.3 million ha of the total land area is covered by some type of forest (GoSL, 2005). It is estimated that about 365,000 ha is closed forest with about 3,774,000 ha being forest re-growth. There are about 4,000 ha of Protected Forest Plantations but these too are under increased pressure for fuel wood and are being cleared for agricultural cropping. Overall 75-80% of the forested area has been used for arable cropping.

Forests are important for economic development, environmental services, social and cultural values. They provide products such as timber, pulp and paper, poles and fuel wood both for industrial and domestic use and a wide range of non-wood forest products. Forests are important for conservation of biological diversity, watersheds, carbon sequestration and are a major habitat for wildlife.

Tree crop farming currently provides employment opportunities to about 100,000 rural producers. Almost all production currently takes place on smallholder plantations averaging 1-2.5 ha in size. These plantations are, however, relatively old ranging from 60 years for cocoa (Amelonado varieties) to 40 years (Upper Amazonian varieties) and 30 years for Robusta coffee varieties. Yields have, therefore, fallen from 400 kg/ha in 1985 to 100-200 kg/ha as compared to yields of 300 kg/ha of cocoa currently attained in other parts of West Africa. Similarly, coffee yields have dropped from 200 kg/ha to 100 kg/ha. These low yields are due to the old age of the trees as well as poor agronomic practices compounded by the fact that many of the plantations were abandoned during the one decade long civil war.

Until the late 1990s, Sierra Leone was a producer of significant quantities of tree crops for export. It is estimated that 42,000 ha of cocoa, 76,500 ha of coffee and over 60,000 ha of oil palm were cultivated before the war. These crops were grown mainly on

smallholdings of about 0.4-1.2 ha. Recently, farmers have become keen to start cashew production.

By the time the war started in 1991, Sierra Leone was still able to export nearly 12,000 tons of cocoa and 27,000 metric tonnes of coffee. During the war these plantations were abandoned as young men who provided the labour force went to fight or fled to safety in big towns and cities. The volume of these exports, therefore, dropped drastically to between 2,800 and 3,000 metric tonnes of cocoa and 1,300 metric tonnes of coffee per annum. At the end of the war in 2000, efforts were made to rehabilitate these plantations. These efforts have started paying dividend and the volume of exports has started to increase.

4.7.2 Challenges and Constraints

The forestry and tree crops sub sector in Sierra Leone faces a number of challenges which are closely linked to rapid human population growth. The limited area of forest land, estimated at 4% of the total land area, is decreasing at a fast rate due to pressure from agricultural expansion and settlement. The area under industrial forest plantations is also expected to decrease. Woodlands and bush lands in the dry lands in Northern Sierra Leone are also under great pressure from cattle farmers. The loss of forest cover and other types of woody vegetation will lead to increasing scarcity of a wide range of forest products, environmental degradation and loss of biodiversity.

The development of forestry and tree crops plantations in the country is faced with the problems of low rate of replanting in harvested areas, reliance on a few exotic species which are being threatened by pests and diseases, poor agricultural management and inefficient use of wood. In addition to this, there is lack of value addition to the products to attract better prices for farmers. Limited value addition and product development hinders access to new market opportunities. Although there are policies in place their implementation remains a challenge. In addition, some policies covering the sub sector are not conducive for increased growth. The failure to formulate and implement conducive policies has lead to increased encroachment of forests due to shifting cultivation, excessive logging and fuel wood harvesting, all of which are estimated to destroy 6,000 ha of forest per year (GoSL, 2010).

Forestry and tree crops research has been constrained by outbreak of diseases, inferior genetic potentials of plant materials, poor storage and processing facilities, inadequate access to knowledge and information technologies and extension services, weak technical manpower base, and the lack of production facilities. The challenge therefore is the provision of information and knowledge that will empower producers to be market-oriented.

The Sierra Leone Government recognizes the need to conserve its biological diversity. There is great diversity of plant species which include many species that have value as traditional food items, medicines and for various domestic purposes. The Government

has made a commitment to conserve the remaining 25% of total forest area. Emphasis will be placed on in situ conservation of biodiversity within protected areas such as forest reserves, game reserves, national parks and wildlife sanctuaries. In situ conservation outside protected areas will also be encouraged to complement conservation of biological diversity inside protected areas, to secure Sierra Leone's biodiversity for future generations (GoSL, 2010). A Transboundary Park has been demarcated between Sierra Leone and Liberia to protect the remaining Guinnea Forest which now stands at a mere 5% of the original forest.

4.7.3 Strategic Focus

The Forestry and Tree Crops Programme is coordinated and implemented by the Kenema Forestry and Tree Crops Research Centre (KFTCRC). The Programme is expected to **enhance sustainable productivity, commercialization and competitiveness of the forestry and tree crops.** In order to do this, the Programme is expected to contribute to the delivery of the overall institutional purpose through the attainment of its purpose of **Generating and promoting innovative forestry and tree crops technologies and empowerment of stakeholders.** The Programme shall deliver this purpose through the attainment of the following five strategic results:

(i) Appropriate forestry and tree crops product value chains technologies and innovations **generated and promoted.**

(ii) Appropriate markets and marketing strategies for enhancing forestry and tree crops product value chains **developed and promoted.**

(iii) Appropriate policy options for enhancing forestry and tree crops product value chains **facilitated and advocated.**

(iv) Capacity for implementing forestry and tree crops product value chains research **strengthened.**

(v) Appropriate mechanisms for managing, sharing and up scaling forestry and tree crops knowledge, information and technologies **established and operationalized.**

In order to contribute significantly to the attainment of the overall institutional purpose, the Forestry and Tree Crops Programme shall focus on five product value chains outlined below. The importance of each product value chain in contributing to the national economic growth and agricultural and forestry sectors development as well as improvement of livelihoods, income generation and food security shall, be determined through prioritization process discussed in chapter three. The allocation of resources for research shall then be based on the results of the priority setting process. Each of the intervention strategies to be carried out under each product value chain shall be expected to contribute to the attainment of the five Programme strategic results.

(i) Development and promotion of Forestry product value chains.

(ii) Development and promotion of Cocoa product value chain.

(iii) Development and promotion of Coffee product value chain.

(iv) Development and promotion of Cashew product value chain.

(v) Development and promotion of Oil palm crop product value chain.

4.8 Land, Water and Environment Programme

4.8.1 Rationale and Justification

Sierra Leone has a total land area of 72,000 km² (7,200,000 ha) with a total upland area and low lands covering 60,650 km² (6,065,000 ha) and 11, 650 km² (1,165,000 ha), respectively. The land suitable for crop production is about 5.36 million hectares, which is 74.2% of the total land area. Non-arable land, which includes hills, rocky land, roads, urban areas, rivers and creeks account for the remaining 35.8%.

In general, the country is divided into five ecological systems that include Upland ecology, 4.30 million ha or 80.2% of the arable land area; inland valley swamps 0.63 million hectares (11.8%); Riverain Grasslands 0.12 million hectares (3.2%); Mangrove swamps, 0.20 million hectares (3.7%); and Bolilands, 0.11 million hectares (2.1%). Of the 5.36 million hectares of land which is suitable for cultivation on a sustainable basis, 4.2 million hectares comprise the less fertile uplands and 1.16 million hectares the more fertile lowlands.

The country has abundant water resources mainly due to the high rainfall (2-5,000 mm per annum). The rainy period is concentrated over seven months. Because of the heavy rainfall discharge, runoff is high and ranges between 20-50% of the total annual rainfall. Ground water resources are also extensive. Most of the country is in the moist tropical zone and formally, high forest covered 50% of the country, leaving a belt of Guinea Savannah Woodlands in the drier northern part. However, less than 5% of the land area is now covered by closed high forest. The remainder is covered by shifting cultivation mainly to farm-fallow scrub and to secondary forest re-growth and, in some areas, to derived Savannah.

4.8.2 Challenges and Constraints

Despite the fact that the country is endowed with abundant natural resources, all efforts aimed at improving agricultural production have failed to produce expected dividends. This state of affairs has been partly attributed to the negative attributes of the very

resources; the high intensity rain storms, the uneven distribution of rainfall across the country, the high temperatures and high humidity during the rains, the low hours of sunshine due to cloud cover during the peak of the rainy season and the reduced moisture availability during the first three months (January, February and March) of the dry season.

The above negative attributes of the resources have combined with the unsustainable land use practices and the uncontrolled and uncoordinated exploitation of the land and water resources to exacerbate land degradation. A combination of rapid deforestation, land degradation and uncontrolled exploitation of natural resources threatens Sierra Leone's environment. Vast expanses have been deforested due to demographic and economic pressures, mining activities, traditional farming practices, the need for fuel wood, and in the north by overgrazing and annual bushfires. Both upland forests and coastal mangroves are being increasingly over-exploited.

Research into the natural and potentials of land and water resources for agricultural development is extremely crucial for the development of a nation's agricultural base in particular, and its economy in general. Since 1910 when research commenced in Sierra Leone, research for the development of land and water resources has been largely neglected. This negligence has been partly responsible for the slow advancement of agricultural development of the nation.

4.8.3 Strategic Focus

The Land, Water and Environment Programme is coordinated and implemented by the Magbosi Land and Water Research Centre (MLWRC). The Programme is expected to **enhance sustainable productivity, commercialization and competitiveness of the agricultural sector.** In order to do this, the Programme is expected to contribute to the delivery of the overall institutional purpose through the attainment of its purpose of **Generating and promoting innovative land, water and environment technologies and empowerment of stakeholders.** The Programme shall deliver this purpose through the attainment of the following five strategic results:

(i) Appropriate land, water and environment technologies and innovations for enhancing agricultural product value chains generated and promoted.

(ii) Appropriate land, water and environment contribution for enhancing agricultural product value chains markets and marketing strategies developed and promoted.

(iii) Appropriate land, water and environment policy options for enhancing agricultural product value chains facilitated and advocated.

(iv) Capacity for implementing land, water and environment research for enhancing agricultural product value chains strengthened.

(v) Appropriate mechanisms for managing, sharing and up scaling land, water and environment knowledge, information and technologies established and operationalized.

In order to contribute significantly to the attainment of the overall institutional purpose, the Land, Water and Environment Programme shall focus on five sub programmes outlined below. Each sub programme shall be expected to contribute significantly to the

upgrading and promotion of priority agricultural product value chains selected through prioritization process discussed in chapter three. This shall, in turn, contribute to the national economic growth and agricultural sector development as well as improvement of livelihoods, income generation and food security. The allocation of resources for research in the programme area of focus shall then be based on the results of the priority setting process. Each of the intervention strategies to be carried out under each product value chain shall be expected to contribute to the attainment of the five Programme strategic results.

(i) Improvement on the contribution of integrated soil fertility management on agricultural product value chains.

(ii) Improvement on the contribution of soil and water management on agricultural product value chains.

(iii) Improvement on the contribution of irrigation and drainage on agricultural product value chains.

(iv) Improvement on the contribution of soil survey, land evaluation and land use planning on agricultural product value chains.

(v) Improvement on the contribution of sustainable environment management and climate change adaption and mitigation on agricultural product value chains.

5.0 RESEARCH SUPPORT FUNCTIONS

5.1 Rationale and Justification

The successful implementation of the strategic research programme areas of focus outlined in chapter four will depend largely on the availability, effectiveness and efficiency of the institutional research support functions. This chapter, therefore, focuses on the institutional capacities and competences that are required to implement the priority activities to be identified under the research programme areas of focus outlined in Chapter four.

The institutional capacity describes the state of an institution with its human, financial and infrastructure possibilities to make a difference. Competence, however, goes one step further and describes the demonstrated capacity of an institution to perform the work that is to be done. The required capacities and competences will emanate from within SLARI and her collaborating partners. The capacities focus on the human, financial and physical resources and the institutional arrangements that will be required to adequately address the issues highlighted under the strategic research programme areas of focus.

5.2 Challenges and Constraints

SLARI was established by an Act of Parliament as the country's agricultural research and agricultural technology generating body for the benefit of the farming, fishing and forestry sectors and to provide for other related matters. When fully operational, SLARI shall be composed of seven research centres spread throughout the country. These include (i) Njala Agricultural Research Centre (NARC); (ii) Rokupr Agricultural Research Centre (RARC); (iii) Kabala Horticultural Crops Research Centre (KHCRC; (iv) Teko Livestock Research Centre (TLRC); (v) Freetown Fisheries Research Centre (FFRC); (vi) Kenema Forestry and Tree Crops Research Centre (KFTCRC); and (vii) Magbosi Land and Water Research Centre (MLWRC).

These centres are at different stages of development and, therefore, the main challenge for SLARI is to fast-track the development of the centres by equipping them with adequate staff, buildings, equipment and funding to enable them carry out research programmes and projects in their respective mandate areas. The expected overall development impact is a well-developed national research capacity and competence that can undertake effective Agricultural Product Value Chain (APVC) research within the framework of Integrated Agricultural Research for Development (IAR4D). The centres have been categorized into following three categories depending on the availability of staff, infrastructure, research programmes and funding:

(i) ***Category 1 Centres***: These are the centres that currently exist and have buildings equipment, staff, ongoing research programmes and funding. The centres under this category include Njala Agricultural Research Centre and Rokupr Agricultural Research Centre.

(ii) ***Category 2 Centres****:* These are the centres that have a site on which there are damaged buildings with little or no equipment, few staff, extremely small or non-existent research programme and very little or no direct funding. The centres under this category include Freetown Teko Livestock Research Centre, Fisheries Research Centre, Kenema Forestry and Tree Crops Research Centre and Magbosi Land and Water Research Centre.

(iii) ***Category 3 Centres:*** These are the centres that have yet to be established physically with a permanent site, buildings, staff, and other resources and which have no funding available to them. Only one centre, Kabala Horticultural Crops Research Centre, is under this category.

Structural Adjustment Programmes (SAPs) that have continued to be implemented in many African countries call for adjustments in many sectors of the economy. The SAPs have had far-reaching effects on the performance of agricultural research systems. They have provoked an unprecedented institutional, societal and governmental search for new knowledge that will serve as a guide for development programmes. In this period of world transition, many of the previous concepts, approaches and models no longer function as a reference and new concepts have not yet been clearly designed. As a result of this, institutions have been developed without well-defined vision and mission. Many lack external references that would help them understand the ongoing changes and their related forces. Adequate internal mechanisms to redefine a course of institutional development and to reorganize existing resources are also lacking.

As a public research institute, SLARI is expected to conduct agricultural research of strategic national importance and produce national public goods in the form of technologies, information and knowledge. It is also expected to contribute to regional and global public goods together with its partners. In order to develop the required capacity and competence, SLARI shall need to establish and operationalize an effective and efficient administration and organizational management system at its Headquarters and replicate it at centre level.

The primary task of the administration and organizational management system shall be to create the appropriate policy, technical and social environment within the Institute to facilitate effective and efficient performance of research and support personnel. To be effective in doing this, the SLARI research managers at the Headquarters and centres shall be expected to understand the factors which motivate their research and support personnel to improve their performance so as to be in a better position to influence and improve the overall productivity of the Institute and centres.

The management for Agricultural Product Value Chain research within the framework of Integrated Agricultural Research for Development requires a balance between flexibility to encourage creativity and direction to ensure that both the Institute and programme mandates are effectively and efficiently delivered/ attained/achieved. In addition to the normal human resource development and management tasks of planning, staffing, development, compensation and evaluation, an effective research manager shall need to understand researcher motivation as well as management of interpersonal and group behaviour through effective leadership, team building, improved communication, and conflict and crisis management.

In view of this and considering the need to be effective and efficient, SLARI shall require to develop and adopt a style of leadership and management which allows a diverse group of highly trained and potentially creative individuals to work individually and collectively to achieve the institutional and programme goals and objectives. The style of leadership to be adopted by SLARI Headquarters and its research centres shall be dependent on the following key factors relating to (i) the managers - personality, confidence, values, motivations; (ii) the researchers - motivation factors, education, experience, commitment, understanding of organization goals; and (iii) the organization itself - mandate, resources, responsiveness and place in society. Well-trained SLARI managers should be able to address many of these factors to improve researcher and organizational performance.

Because managers get results through people, they must design the best methods and means of making their staff achieve their best. However, in most research institutes in the developing countries, research managers are not trained in organizational management. Many of them are appointed to leadership positions on the basis of their scientific contribution and not on their managerial experience and capability. Once appointed into leadership positions they are expected to somehow turn themselves into good managers to deal with issues related to research management as well as human, financial and physical resource management. These are areas that they may not have been trained in and in most cases the system never prepares them for this. Instead they are left to learn on the job and in most cases this leads to disaster.

5.3 Strategic Focus

The successful implementation of the seven programme areas of research will depend largely on the establishment and operationalization of effective and efficient research support functions. Like the Research Programme areas of focus discussed in chapter

four, the research support functions shall be expected to contribute to the attainment of the overall institutional purpose through the attainment of its purpose of **contributing to the generation and promotion of innovative agricultural technologies and empowerment of stakeholders.** The research support functions shall deliver this purpose through the attainment of the following five results:

(i) Research support functions contribution to the generation and promotion of appropriate agricultural product value chains technologies and innovations **strengthened.**

(ii) Research support functions contribution to the development and promotion of appropriate markets and marketing strategies for enhancing agricultural product value chains **strengthened.**

(iii) Research support functions contribution to the facilitation and advocacy for appropriate policy options for enhancing agricultural product value chains **strengthened.**

(iv) Research support functions contribution to the development of capacity for implementing agricultural product value chains research **strengthened.**

(v) Research support functions contribution to the establishment and operationalization of appropriate mechanisms for managing, sharing and up scaling agricultural knowledge, information and technologies **strengthened.**

In order to contribute significantly to the attainment of the overall institutional purpose, the research support functions at the SLARI Headquarters shall be structured into six key functions referred to as administrative/management Divisions/Sections/Units as outlined below. The administrative/management Divisions/Sections/Units shall be replicated at the centre level guided by each centre's stage of development, the size of the centre, availability of resources, and identified centre needs. Each of the intervention strategies to be carried out under each management Divisions/Sections/Units shall be expected to contribute to the attainment of the five research support functions strategic results.

(i) Human Resource Development and Management.

(ii) Financial Resource Acquisition and Management.

(iii) Physical Resource Development and Management.

(iv) Procurement and Supplies Services.

(v) Information Communication and Documentation.

(vi) Institutional Corporate Governance.

5.3.1 Human Resource Development and Management

People are the most important resource for any national agricultural research institution. Policies and practices for managing human resources of agricultural research institutions differ in many aspects from those of many other types of public and private sector institutions. Agricultural researchers have unique occupational needs and characteristics which have important implications for management. They have high expectations for job fulfilment and need considerable autonomy in deciding on and carrying out their research activities. It is, therefore, very important for the SLARI agricultural research managers to ensure that the Institute attracts, develops, retains and effectively utilizes human

resources with specific skills, attitudes and motivations that can allow the Institutional objectives to be attained effectively and efficiently.

The most important tasks in human resource management in agricultural research can be grouped into planning, staffing, development, compensation and evaluation. Effective human resource management in SLARI shall, therefore, be seen as an interactive process that begins with the inputs of the Institutional and centre research objectives, available Institutional and centre operating resources and critical analysis of the current state of the human resources. The focus for the human resource development and management initiative shall be to strengthen the capacity of the Institute Headquarters and the centres to develop, institutionalize and sustain functional and effective human resource development policies/plans on training and career development that are geared towards improvement of the individual person, the group and the overall organizational effectiveness.

Summary of current status of human resources at the SLARI Headquarters and centres as well as the optimal human resource requirements is shown in Annex 2. This proposed optimum staffing level has been determined through a thorough analysis and evaluation of the Institute's Headquarters and centre's needs in light of their set mandates. In coming up with the required human resource, the scientist to support staff ratio of 1:6 was applied even though this is an average figure. Given the poor state of the human resource, particularly in category two and three centres, the Government will need to move with speed to recruit the staff required by the SLARI Headquarters and centres to enable them carry out their functional obligations.

In order to achieve this and contribute to the improvement of the overall Institute efficiency and effectiveness, the Human Resource Division will focus on the analysis and prioritization of the institutional human resource requirements and development and institutionalization of a functional and effective human resource development and management system. This will involve the development and operationalization of various human development and management guiding documents that include Human Resource Development and Management Strategy, Terms and Conditions of Service, the Schemes of Service, Performance Management (staff performance contracting) and Training Policies among others.

5.3.2 Financial Resource Acquisition and Management

Financial resource acquisition and management has become a subject of increased concern because of budgetary constraints; increased competition for financing; challenges to increase efficiency in the public sector; the need for increased performance of public-sector organizations; taxpayers' demand for transparency and accountability; need for better governance systems; and evolution from a control system of inputs to a control system of products and results. Because of this, financial resource acquisition and management in SLARI shall be seen as a set of activities aimed at putting financial resources to the service of achieving the objectives of agricultural research.

Agricultural research in SLARI has largely been public funded. The Government of Sierra Leone, assisted by development partners, has continued to fund agricultural research from the recognition that agricultural research is fundamentally a public good. On average, the rate of return to investment in agricultural research is supposed to be relatively high compared to alternative investment opportunities. In addition to this, investment in agricultural science and technology has contributed substantively to past growth performance and is expected to contribute significantly to the achievement of future national development priorities. However, there has been heavy dependence on often erratic foreign aid to fund agricultural research.

Currently, the Government has attracted considerable funding from multilateral and bilateral development partners for research. These funds have been accessed through proposals and negotiations with development partners. However, in order to attract more funding from development partners and other grant making foundations and corporations, SLARI will need to build/strengthen the capacity of its scientists in competitive grant project proposal writing, improve on negotiation skills for funding, establish beneficial donor relations and build donor confidence in its financial management and project implementation.

Private sector funding of agricultural research is currently minimal compared to most other developing countries. This is because returns to investment in research is slow and long-term, while private sector institutions favour more rapid returns from investments. A more pressing constraint to private sector funding of agricultural research emanates from lack of clear legislation and mechanisms for cost and benefit sharing. This anomaly equally constrains the development of public-private sector partnership initiatives and contract agricultural research.

Despite all these factors, promotion of research and technology development is one of the critical areas the Government has recognized in the Vision 2025 and in the National Sustainable Agriculture Development Plan (NSADP). The Government also recognizes the low funding levels that has been directed to research and has, therefore, taken a long-term view to seek ways and means to diversify the funding base and enhance the financial sustainability of agricultural research. In line with these Government initiatives and considering the need to contribute to the improvement of the overall Institute efficiency and effectiveness, the Financial Resource Division will focus on the analysis and prioritization of the institutional financial resource requirement and development and institutionalization of a functional and effective financial resource acquisition and management systems. Summary of SLARI institutional financing requirements for the first operational plan covering the period 2012-2016 is shown in Annex 3.

5.3.3 Administration and Physical Resource Development and Management

The provision of administration and physical resource development and management services in a research institution is very crucial to the conduct of agricultural research. The functions of the administration and physical resource development and management

Division are supposed to interface with all other core departments and divisions of the institution in the provision of essential services such as administration, transport, security, maintenance, construction of facilities, telephone, farm and estate management among others. The conduct of efficient and effective agricultural research relies, among other factors, on the proximity and the availability of an appropriate physical infrastructure for research service delivery. The main physical resources required for a research institution such as SLARI include land, offices, staff residential houses, laboratories, workshops, stores/warehouses, vehicles and equipment.

When fully operational, the physical capacities for SLARI shall be composed of seven research centres spread throughout the country with adequate land resource, well-developed office and residential houses, and laboratory facilities that support research. This physical capacity shall give the Institute the necessary research facilities that enable generation of technologies, knowledge and information relevant to all agro-ecological zones in the country. However, a lot of the physical facilities were destroyed during the country's civil war and will, therefore, require heavy investment in the reconstruction of the facilities. Currently, only two of the seven research centres have the basic infrastructure to carry out research. Efforts shall, therefore, be made to complete the rehabilitation of the destroyed facilities, construction of additional facilities and provision of the necessary equipment at these two centres referred to category one centres to enable them be fully operational. The research programme areas of focus to be carried out at the other five centres is equally important in contributing to the national economic growth and agricultural sector development as well as improvement of livelihoods, income generation and food security. Because of this, efforts shall be made to establish these category two and three centres and equip them with the necessary physical facilities and equipment to enable them to become fully operational. The development and provision of infrastructure and facilities at each centre shall be guided by the research priorities identified under the research programme areas of focus coordinated and implemented by each centre.

In view of this and considering the need to contribute to the improvement of the overall Institute's efficiency and effectiveness, the Administration and Physical Resources Division shall focus on the analysis and prioritization of the institutional administration and physical resources requirement and development and institutionalization of a functional and effective administration and physical resources development and management systems and processes.

5.3.4 Procurement and Supplies Services

Expeditious and effective procurement of goods and services coupled with their effective utilization is very important in carrying out the operations of all public institutions. In order to ensure this, many Governments have made it mandatory for all public institutions to establish effective and efficient procurement and supplies division with qualified procurement staff. The operations of these divisions are guided by clear procedures for procuring goods and services and disposal of unserviceable, obsolete or surplus stores

and equipment by public entities in order to maximize efficiency, promote competition, integrity, fairness accountability and transparency.

In compliance with this, SLARI shall strengthen the Procurement and Supplies Division at the Institute's Headquarters and at the centres so as to ensure economic, efficient and competitive procurement of goods and services. The Division shall be expected to contribute significantly to the attainment of the overall Institutional Mission through timely procurement and supply of goods and services at the right quantity, quality and at competitive prices in accordance with the existing Government Procurement and Disposal procedures.

In view of this, and considering the need to contribute to the improvement of the overall Institute efficiency and effectiveness, the Procurement and Supplies Division will focus on the analysis and prioritization of the institutional procurement and supplies requirement and development and institutionalization of a functional and effective procurement and supplies system.

5.3.5 Information, Communication and Documentation

There have been concerns from many international, regional and national research and development organizations on the limited adaptation, adoption and utilization of knowledge from research institutions. Poor flow of information between research institutions and end users of technology is responsible for the limited impact of research. As a result, organizations are adopting and utilizing information communication technology (ICT) as the key driver for knowledge management in improving communication. A dynamic communication system should be able to connect the various stakeholders in the agricultural sector to knowledge, information and technology needed for research, extension services, education and training, agribusiness, agricultural productivity, agricultural produce, value addition, financing and marketing opportunities among others. Given this understanding, SLARI will need to establish and operationalize an effective and efficient Information, Communication and Documentation (ICD) Division. The ICD Division shall be expected to enhance the capacity of the Institute to access and use modern information technology to store, manage, avail, exchange and disseminate information for use by both the Institute staff and its stakeholders and to formulate the mechanisms for the free flow of technical and related information between the different categories of stakeholders. To achieve this, the Division shall be expected to focus on the analysis and prioritization of the knowledge, information and communication technology requirements for different user groups and the provision of knowledge, information and communication technology in response to different clients' demands and opportunities so as to improve the overall Institute efficiency and effectiveness. To achieve this role, the ICD Division shall be expected to work closely with the research programmes to ensure that knowledge, information and technologies generated are appropriately packaged and disseminated to different stakeholder categories using appropriate communication media and channels.

In view of this and considering the need to contribute to the improvement of the overall Institute efficiency and effectiveness, the ICD Division shall focus on the analysis and prioritization of the knowledge, information and communication technology requirements for different user groups and the provision of knowledge, information and communication technology in response to different clients' demands and opportunities. In addition to this the Division shall be required to develop and institutionalize a functional and effective information, communication and documentation system.

5.3.6 SLARI Directorate and Council Corporate Governance

A corporation is a congregation of various stakeholders including customers, employees, investors, collaborators, partners, government and society in a given company or organization. A corporation should be fair and transparent to its stakeholders in all its undertakings. This has become imperative in today's globalized business world where corporations need to access global pools of capital; need to attract and retain the best human capital; need to form beneficial partnerships and strategic alliances; and need to live in harmony with the community. Unless a corporation embraces and demonstrates ethical conduct, it will not be able to succeed in the current highly competitive world.

It is a clearly known fact that the success of any organization lingers on its ability to mobilize and utilize all kinds of resources to meet the objectives set as part of its planning process. Increasingly, revelations of deterioration in quality and transparency have called for adoption of internationally accepted 'Best Practices' which gave rise to 'Corporate Governance'. Corporate governance is the processes and related organizational structures by which organizations are directed, managed and held to account. It influences how the objectives of the organization are set and achieved, how risk is monitored and assessed and how performance is optimized. It is a system of structuring, operating and controlling an organization with a view to achieve long-term strategic goals to satisfy stakeholders and employees while complying with the legal and regulatory requirements apart from meeting environmental needs.

The current SLARI organizational and management structure is weak in the area of corporate governance and will, therefore, need to be strengthened in line with the modern corporate culture. In order to continually improve on its efficiency and effectiveness while building on its credibility, SLARI Directorate and Council will strive to embrace the concept of good corporate governance to assist the management to pursue objectives that are in the interest of the Institute as well as to facilitate effective monitoring and efficient utilization of resources entrusted to it. Given this understanding and in compliance with the modern corporate culture and related organizational structures, SLARI shall have to establish effective and independent corporate governance divisions/units designed to contribute towards the Institute's accountability; effectiveness and efficiency; integrity and transparency; and open leadership. However, considering that SLARI is a lean institution at the moment, it may not have the resources to establish fully-fledged corporate governance divisions/units but rather may consider establishing offices to deal with the following specific corporate governance aspects:

(i) ***Planning Monitoring and Evaluation:*** A well-organized and functional planning, monitoring and evaluation (PM&E) system will contribute significantly to the decision-making process at different levels of the Institute. For the PM&E to be an effective tool for decision-making, information obtained will need to be relevant, timely and accurate.

(ii) ***Internal Financial and Assets Audit:*** The main role of this Unit shall be to monitor and evaluate the technical and operational systems to identify any foreseeable risks, deviations from laid down procedures, rules and regulations, and apply the right tools to make timely corrective measures.

(iii) ***Corporate Legal Services:*** SLARI is a legal entity duly established by an Act of Parliament and is, therefore, capable of suing and being sued. The main role of Corporate Legal Services shall, therefore, be to ensure that the Institute operates within the laws of the Republic of Sierra Leone; observes all international legal issues and effects arising from international and regional treaties and conservations affecting agricultural research and products; protection of all technologies and innovations developed by its research programmes through Intellectual Property policy and procedures; and establishment and operationalization of effective and efficient partnerships and strategic alliances among the wide range of actors involved agricultural research.

6.0 STRATEGIC PLAN IMPLEMENTATION ARRANGEMENTS

6.1 Governing and Management Structure

An organizational structure is a framework of functional relationships between the various organs of an institution, showing the hierarchical arrangements of the decision-making tree, and how activities of the institution are organized, controlled, integrated and coordinated. In the case of SLARI, the SLARI Act contains clear statements of the composition and key functions, roles, and responsibilities for the various management elements and structures within the organization. As a state corporation, the governance of SLARI is vested in the SLARI Council which is the highest administrative and policy making body under the Act with the powers to control and supervise the operation of the Institute. The Council is made up of 28 members, seven of whom are *ex officio* members. The Council has the following four committees to support its operation and that of SLARI as an organization:

- Scientific and Technical Committee.
- Appointments, Promotion and Disciplinary Committee.
- Administration and Finance Committee.
- Documentation, Data Management and Information Committee.

Under the Act, only the positions of Director General, Deputy Director General and Research Coordinator are defined. The Director General is the Chief Executive Officer (CEO) of the Institute responsible for the day-to-day management of the Institute. In order to strengthen the management of the institute, it is proposed that there should be two Deputy Director Generals reporting to the Director General to be in charge of Research and Development Department and Finance and Administration Department as shown in Annex 4.

The Deputy Director General in charge of the Research and Technology Department shall coordinate and provide professional leadership in research operations which are the core functions of the institute. The Deputy Director General shall supervise the Centre Directors in charge of the seven Centres implementing the seven research programme areas of focus. The Deputy Director General shall be assisted by a Research Coordinator who shall be responsible for programme development, outreach, partnerships, socioeconomics, biometrics, and policy analysis and advocacy

Similarly, the Deputy Director General in charge of the Finance, Human and Administration Department shall provide leadership in the research support functions of the Institute through appropriate supervision and coordination of the administrative operations of the Divisions of (i) Human Resource Development and Management, (ii) Financial Resource Mobilization and Management, (iii) Administration and Physical Resource Development and Management, (iv) Procurement and Supplies Services; and (v) Information, Communication and Documentation. These divisions shall be managed by division heads reporting to the Deputy Director General in charge of Finance, Human and Administration Department.

Besides the research and research support divisions, there shall be three units whose functions cut across all departments, divisions, centres and technical programmes. These units shall constitute the institutional corporate governance and include (i) Planning, Monitoring and Evaluation; (ii) Internal Financial Assets Audit; and (iii) Corporate Legal Services. The heads of these three units shall report directly to the Director General in line with modern corporate settings. It is expected that such an arrangement will increase efficiency and productivity through shortening of the reporting lines, enabling effective coordination of functions and limiting the number of direct reports to allow for more strategic focus.

The proposed departments, divisions and units shall be established progressively as the Institute grows in respond to specific needs and as more resources become available. In order to ensure establishment of effective and efficient SLARI directorate, therefore, there is a need to carry out an assessment of the required overall organizational and management structure early in the implementation of this Strategic Plan. This specialist review shall be expected to produce a detailed Governance manual to cover all aspects of operation from project field staff to Council, and shall include the links and processes required to operate. Subsequently, manuals to cover other aspects of the operation of the Institute shall be developed as part of the activities of the Institute directorate.

The SLARI research portfolio made of research programme areas of focus shall be implemented at the seven research centres that constitute the institute. Each of the centres has been assigned specific research programme area of focus to coordinate and implement in close consultation with the Institute directorate. In view of this, the SLARI directorate organizational and management structure shall be cascaded down to the centre level but reduced in scale and scope to the specific size and needs of each centre. The day-to-day management of each centre shall be vested in the Centre Director assisted by a Deputy Centre Director. Each of the research programme areas of focus coordinated and implemented at each centre shall be made up of several Product Value Chains. Each of the Product Value Chain shall be headed by a Coordinator reporting to Centre Director.

6.1.1 Organizational Values

During the Strategic Plan period, SLARI will strive to nurture an organizational culture that puts a premium on scientific achievement and capacity for effective teamwork and collaborative partnerships that should be reflected at all levels of the Institute's operations. This culture shall be strengthened by appropriate incentives and a participatory system of monitoring and evaluation that provides constant feedback to line managers and staff on progress towards achievement of mutually agreed results and targets. The aim of such a system will be to promote accountability as a personal achievement rather than an escape from sanctions.

This new approach shall put emphasis on analyzing the tasks that the Institute needs to carry out as a basis for determining its human resource requirements. The staff will then be motivated through skill enhancement programmes, sabbaticals and multi-tasking, rewarding good performance in order to increase their participation in broad areas of decision-making and hence their individual stake in the achievement of the Vision and Mission of the Institute. At the policy level, broader partnerships will require the development of appropriate policies for safeguarding intellectual property rights and ensuring equitable sharing of benefits accruing from successful development and adoption of technologies developed by the staff.

6.1.2 Performance Contracting

One of the most significant reforms being undertaken by most governments is the introduction and implementation of a system of performance contracting in the entire public service. An essential feature in performance contracting is the development of a devolved operation style which emphasizes management by outcomes rather than by processes.

As a public-funded corporate entity, SLARI shall embrace performance contracting as a way of organizing and defining its results, responsibilities and tasks to ensure their systematic and purposeful accomplishment. Consequently, the broad intervention strategies described in this Strategic Plan will be broken down into specific activities which will form the basis for negotiated and agreed upon annual performance targets with the Government. Each year's targets will be expected to build upon the previous accomplishments and lead systematically to the realization of the Institute's Mission.

The annual performance targets to be signed between the Government and the Institute will, subsequently be cascaded through the Chief Executive Officer, Centre Directors, heads of Departments, research programmes and divisions down to all staff. These performance targets will, in essence, form the basis of the Institute's annual staff appraisal system.

6.2 Implementation Approach

This ten year Strategic Plan has been developed within the context of a fast-changing and complex socioeconomic environment characterized by such factors as declining resource availability for research; a wide range of Government-led public sector reforms aimed at improving efficiency and effectiveness in the management of the public service; and increased agricultural sector stakeholder/client awareness. Further, the implementation of the Strategic Plan shall run through one of the most challenging periods coming closely after the civil war. Faced with an increasingly unfavourable trade protocols in the world food and input markets, the Government must support SLARI's programmes and interventions strategies outlined in this Strategic Plan. SLARI, on its part, must design appropriate structures and mechanisms for the implementation of these programmes and interventions strategies.

In order to reinvent and position itself to current situation, SLARI has identified five strategic results that are necessary and sufficient to deliver the institute's purpose. To deliver on these results while responding to the issues brought about by the changes in the Government policies and strategies, SLARI has adopted the Product Value Chain (PVC) approach within the framework of Integrated Agricultural Research for Development (IAR4D) and the Agricultural Innovation Systems (AIS) approaches. The implementation of PVC-based projects would require the establishment and maintenance of better working relationship and partnerships between PVC key players/stakeholders. In order to facilitate this, there will be a need to create and operationalize a mechanism for establishing flexible alliance frameworks/innovation platforms that allow different SLARI centres to form temporary PVC teams with other organizations including farmer organizations, universities and the private sector to solve priority PVC problems in a specified period. The formation of such temporary PVC teams would ensure the availability of a critical mass of scientists with the right disciplinary mix to provide multidisciplinary solutions for priority problems.

The implementation of the Strategic Plan shall be underpinned by an integrated and holistic approach based on a research framework carried out through priority thrusts and associated interventions for addressing priority product value chain problems. The implementation of the Strategic Plan will further incorporate joint planning and participation by all key stakeholders so as to ensure that multiple views, needs and concerns in resolving priority product value chains issues at different levels are taken into account and negotiated. The Strategic Plan programme areas of focus shall be addressed through nationally coordinated PVC-based projects. Cross centres and organizational synthesis, networking and sharing of lessons learned shall be used to improve the value of the research findings.

Under-pinning the Strategic Plan and its implementation are also several crosscutting issues. These invariably affect and influence the implementation and direction of agricultural research, and have been recognized sub regionally, regionally and globally. In view of this, SLARI has made a commitment to address these crosscutting issues during

implementation of this Strategic Plan. This commitment to address these crosscutting issues draws on, and aligns the SLARI Strategic Plan with the Strategic Plans of both FARA and CORAF/WECARD.

6.2.1 Promotion of Pro-Poor Economic Growth

Not all economic growth benefits the poor and often they can be adversely affected. Technologies that have economies of scale can focus on the wealthy and when too little attention is paid to the division of labour and resources, yield or profit enhancing developments can adversely affect the welfare of women and other disadvantaged groups. SLARI will endeavour to ensure that the innovations it promotes are pro-poor or at least scale-neutral, and strengthen the resilience of individuals and households to withstand adverse events. Important measures include employment generation and microfinance that can reduce vulnerability while contributing to agricultural growth. Appropriate credit can be used to fund production or mitigate shocks and stresses from medical costs, weddings and funerals, droughts or floods.

Agriculture-related legislation and regulation should ensure that growth promotion does not come with unacceptable increased risk and vulnerability. The promotion of technological change should promote diversification of agriculture in ways that spread risk among different enterprises. Crop and livestock breeding involves trade-offs between yields and vulnerability but, for the poor, care must be taken not to sacrifice too much robustness for higher production potential. Inappropriate inputs can also increase risks due to the greater investment required that may not be recovered in adverse circumstances. Some such as agro-chemicals may also have health and safety risks. Lessons learnt should be communicated to policy makers for incorporation in poverty reduction strategy papers and other poverty-reducing initiatives.

6.2.2 Gender and Age Mainstreaming

Women in Sierra Leone produce up to 80% of basic foodstuffs for household consumption and for the market. In the livestock sector, they perform 50-60% of the work related to feeding and milking larger animals, as well as raising small stock. Women in rural areas provide most of the labour for post-harvest activities, taking responsibility for storage, handling, stocking, processing and marketing. Beyond the farm, women play a key role in land and water management in all developing countries. Women are most often the collectors of water, firewood and fodder. They have access to a store of local knowledge on the medicinal values of plants; they have been in the forefront of soil conservation programmes. Given the extensive participation of women in all aspects of agricultural production, the mainstreaming of gender into the agriculture sector is a key strategy element, not only for the promotion of equality between men and women but also for sustainable agricultural production.

SLARI's strategy for mainstreaming gender into development shall involve understanding of the differing needs and constraints faced by women and men that affect productivity and poverty, and then designing actions so that gender-related barriers to economic

growth and poverty alleviation are reduced and the material well-being of men, women, and children is enhanced. Central to this is the promotion of policies and actions that facilitate equitable access to productive resources by both men and women, as well as integrating gender perspectives in its programmes and activities to ensure benefit by both sexes. Other ways in which SLARI shall use in mainstreaming gender include:

- Ensuring that women's needs are addressed in the development and dissemination of agricultural technologies and policies.
- Enabling women to fully participate in and benefit from agricultural innovation processes.
- Ensuring women farmers and scientists receive the training they need to be fully competitive in their work.
- Ensuring capacity building for both women and men features gender issues prominently.

6.2.3 HIV/AIDS, Drug and Substance Abuse

The Human Immunodeficiency Virus/Acquired Immune-Deficiency Syndrome (HIV/AIDS), drug and substance abuse pandemic has the potential for significantly reducing the likelihood of SLARI and its partners making significant contributions towards meeting the Millennium Development Goals. Medical and funeral costs and the loss of productive family members have permanent negative consequences. In a livelihoods context, there may be significant losses in financial capital as well as the irreplaceable loss of social capital as children lose their parents and mentors and have to fend for themselves. Women are particularly badly affected by the disease because they are more susceptible to infection and they bear most of the burden of care for infected family members. Affected rural households cannot produce sufficient nutritious food, aggravating the impact of the disease. Rural institutions are less able to deliver services and development schemes are left unfinished.

SLARI will ensure that HIV/AIDS, drug and substance abuse is treated as both an emergency and a long-term development issue that requires proactive leadership and a long-term multi-sectoral commitment from Governments and the donor community. Increased awareness of the importance of agriculture in national HIV/AIDS, drug and substance abuse strategies is needed, particularly with respect to the rural poor, given the role of agriculture in food and nutrition security as factors in managing the disease. The role of agriculture in poverty reduction is also crucial to the recovery of HIV/AIDS-affected families and their achievement of self-sufficiency. Gender inequality is associated with the spread of the epidemic and is one of the main determining factors associated with vulnerability to HIV/AIDS, drug and substance abuse. Advancing gender equality should therefore be central to any agricultural response to HIV/AIDS, drug and substance abuse.

6.2.4 Environmental Sustainability

The majority of Sierra Leone farmers are smallholders and the natural resources of land they cultivate are often the only physical assets they possess or to which they have access. Food demands from an expanding population can place great strains on what are mostly low-input systems. This leads to degradation of natural resources in agricultural and pastoral lands, deforestation and expansion into marginal areas affecting critical environmental services such as flood and erosion control, carbon sequestration and water purification. Enhanced climatic variability from global climate change is an additional threat.

Current low-input systems need to be intensified to raise productivity on existing agricultural and pastoral lands and safeguard natural lands and watersheds. These systems are highly diverse with a multitude of cropping systems and practices and strong heterogeneity in farmers' access to resources. To address this complexity, a much more facilitating role for research and development service providers is required, placing emphasis on agro-ecological principles and collective learning rather than on technology prescriptions and transfer. Ecological functions of the agro-ecosystem need to be exploited as much as possible to control pest, diseases and weeds, retain water, and supply nutrients to the crop and enhance the efficiency of external inputs, especially mineral fertilizers. This will save costs, reduce the reliance on external inputs and improve environmental sustainability.

SLARI will facilitate the training of scientists in participatory research methods, agro-ecological principles and systems tools that allow analyses of environmental risk. The programmes of the research centres will also stimulate exchange of information systems and decision-making tools related to the national environment and endeavour to solicit greater public and private investments in environmental research and human resources to make agricultural systems more sustainable.

6.3 Collaboration and Partnerships

The Sierra Leone Agricultural Research Institute recognizes the significant role of each stakeholder and industry player in Integrated Agricultural Research for Development. In view of this, SLARI will adopt a strong collaborative and partnership approach to the development and promotion of Agricultural Product Value Chains. Every step of technology development and dissemination will be undertaken in collaboration with stakeholders. Necessary structures and frameworks will be established to facilitate effective collaborative engagement with other relevant national, regional and international institutions.

The increasing need for every public government organization to show impact of its work makes it imperative for SLARI to partner and collaborate with other relevant organizations and stakeholders. The partnerships are further necessitated by the inadequate resource capacity available within SLARI as well as the need for synergy in the development

and promotion of agricultural product value chains. In view of this, SLARI will strive to establish and operationalize strategic and beneficial partnerships with both internal and external collaborators and partners that include relevant Government ministries and departments, universities, international research organizations, non-governmental organizations, the private sector and development agencies for effective delivery of its services.

6.4 Framework for Operationalizing the Strategic Plan

This Strategic Plan has outlined clear strategic results and research programme areas of focus as well as research support functions that can only be realized through sound implementation plans. To operationalize and finance the Strategic Plan, therefore, the Institute shall develop two detailed Operational and Investment Plans covering the periods 2012-2016 and 2017-2021. In developing the Operational and Investment Plan, the Institute shall engage its staff in formulating intervention strategies that are necessary and sufficient for delivering the institutional strategic results, Mission and Vision. In doing this, efforts will be made to take into account the national, regional and international development aspirations in the development of the agricultural sector; sustainable natural resource and environment management; and the prevailing policy environments.

In order to ensure proper alignment and harmonization with the new Strategic Plan, the Operational and Investment Plan shall be developed using a nesting approach that links the strategic results from the Institute level through the research programme areas of focus as well as research support functions for better outcome mapping and impact orientation. In this nesting approach, therefore, the preparation of the Operational and Investment Plan for operationalizing and financing the Strategic Plan shall take over the planning process from the Product Value Chain level under each research programme area of focus. Each Product Value Chain shall then be discussed in terms of its rationale and justification, challenges and strategic focus. Each challenge and strategic focus section shall conclude with the identification of the necessary and sufficient intervention strategies required to address the identified challenges. This information shall be summarized in Result Frameworks, Implementation Plans and Investment/Financing Plans for each of the research programme area of focus.

The first Operational and Investment Plan shall put emphasis in the reconstruction to resurrect SLARI by putting in place the required human resources, infrastructure and equipment and related facilities require for the conduct of research. During this first Operational and Investment Plan, product value chain analysis, prioritization and development of appropriate upgrading and promotion strategies shall be undertaken leading to the development, promotion and up scaling of agricultural product value chain upgrading technologies and innovations.

6.4.1 Annual Work Plans

The Operational and Investment Plan shall be operationalized and financed through Rolling Annual Work Plans in which the necessary and sufficient activities and their respective milestones required to deliver each yearly target shall be specified. The rolling annual work plans will be linked to the annual Performance Contract (PC) targets. The adoption of the rolling annual work plans shall be expected to facilitate the review of the research agenda in close consultation with the relevant key stakeholders and their adjustment in the context of emerging priorities and funding opportunities. The annual work plans shall be expected to provide full details on the outputs and their respective intervention strategies, activities, milestones, operational budgets and the implementing programmes and collaborating institutions/organizations.

6.5 Monitoring and Evaluation

Monitoring and evaluation (M&E) is an integral part of performance management. The purpose of M&E is to evaluate the progress of planned activities with a view to ensuring that their implementation is proceeding according to plan and the set targets are being met. During the implementation of the different activities, a continuous participatory and rigorous self-monitoring and evaluation shall be encouraged. To monitor and evaluate progress during the implementation, SLARI and collaborating institutions/organizations shall undertake internal and external programme reviews over the Strategic Plan period and the results of the reviews widely circulated to the relevant agricultural sector ministries, development partners and key stakeholders.

In order to institutionalize the monitoring and evaluation process, SLARI shall develop and operationalize a suitable monitoring and evaluation system/mechanisms capable of tracking the implementation of the approved Product Value Chain based-projects and activities. The monitoring and evaluation system shall include the use of logical frameworks, work plans, field visits, quarterly and annual reports, mid-term internal evaluation, biannual conferences and end of term external evaluation. The SLARI institutional level result framework is shown in Annex 1.

The abridged version of the quarterly reports from the research programmes and collaborating institutions will form the Product Value Chain based project's annual reports which will in turn feed into the mid-term internal evaluation. The mid-term internal evaluation results will, in turn, assist in the external evaluation whose results will form a major input in the preparation of the subsequent work plans. Outputs of all research activities undertaken will be consolidated into annual reports and shared among stakeholders within the agricultural sector. The research results obtained will also be presented in conferences, symposia and published as journal articles for wider information and knowledge sharing.

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ANNEXES

Annex 1: SLARI institutional level result framework

Intervention Logic	Basis for Objectively Verifiable Indicators by 2016	Means of Verification	Assumptions
General Objective To enhance sustainable productivity, commercialization and competitiveness of the agricultural sector	**1.1** Percentage research contribution to the sustainable broad based growth in the agricultural sector.	**1.1** National impact assessment reports. **1.2** Economic survey reports.	**1.1** Government policies will continue to be favourable to the development of the agricultural sector
Specific Objective Generation and promotion of innovative agricultural technologies and empowerment stakeholders	**1.1** Percentage increase in agricultural productivity attributed to adoption of research knowledge, information and technologies. **1.2** Percentage increase in agricultural commercialization attributed to adoption of research knowledge, information and technologies. **1.3** Percentage increase in agricultural competitiveness attributed to adoption of research knowledge, information and technologies	**1.1** Government reports. **1.2** Institutional reports. **1.3** External evaluation and impact assessment reports. **1.4** Programme reports..	**1.1** Enabling policy environment for increasing agricultural productivity, commercialization and competitiveness will prevail. **1.2** Political stability will continue to prevail in the country

Institutional Level Results			
1.0 Appropriate agricultural product value chains technologies and innovations **generated and promoted.**	**1.1** Number of technologies and innovations developed and promoted along different product value chains. **1.2** Number of the developed and promoted technologies and innovations adopted by clients along different product value chains.	**1.1** Government and sector reports. **1.2** Institutional reports. **1.3** External evaluation and impact assessment reports. **1.4** Programme reports	**1.1** Agricultural sector will continue to be a major driver of the national economy **1.2** The Government will continue to support agricultural research **1.3** Favourable weather conditions will prevail
2.0 Appropriate markets and marketing strategies for enhancing agricultural product value chains **developed and promoted.**	**2.1** Number of marketing strategies identified and utilized for different product value chains. **2.2** Number of markets identified and utilized for different product value chains.	- Do -	- Do -

3.0	Appropriate policy options for enhancing agricultural product value chains **facilitated and advocated.**	**3.1** **3.2** **3.3**	Number of policies and policy issues identified and advocated Number of researchable policy issues addressed Percentage increase in the information gathered for facilitating policy change	- Do -	- Do -
4.0	Capacity for implementing agricultural product value chains research **strengthened.**	**4.1** **4.2** **4.3**	Percentage increase in human resource with the right mix, skills, attitude and knowledge. Percentage increase in financial sustainability and health. Percentage increase in required infrastructure and facilities	- Do -	- Do -
5.0	Appropriate mechanisms for managing, sharing and up scaling agricultural knowledge, information and technologies **established and operationalized.**	**5.1** **5.2** **5.3** **5.4**	Number of stakeholders and their communication needs identified Number of communication products developed and produced. Number of communication channels developed and utilized Percentage increase in the demand for the programme information, products and services	- Do -	- Do -

Research Programme Area of Focus
1.0 Root, Tuber and Grain Legume crops Programme **2.0** Cereal Crops Programme. **3.0** Horticultural Crops Programme. **4.0** Livestock Programme. **5.0** Fisheries Programme. **6.0** Forestry and Tree Crops Programme. **7.0** Land, Water and Environment Programme. **Each of the programme area of focus shall be expected to contribute to the attainment of the five Institutional level results**
Research Support Functions
1.0 Human Resource Development and Management. **2.0** Financial Resource Acquisition and Management. **3.0** Physical Resource Development and Management. **4.0** Procurement and Supplies Services. **5.0** Information Communication and Documentation. **6.0** Institutional Corporate Governance. **Each of the research support function shall be expected to contribute to the attainment of the five Institutional level results**

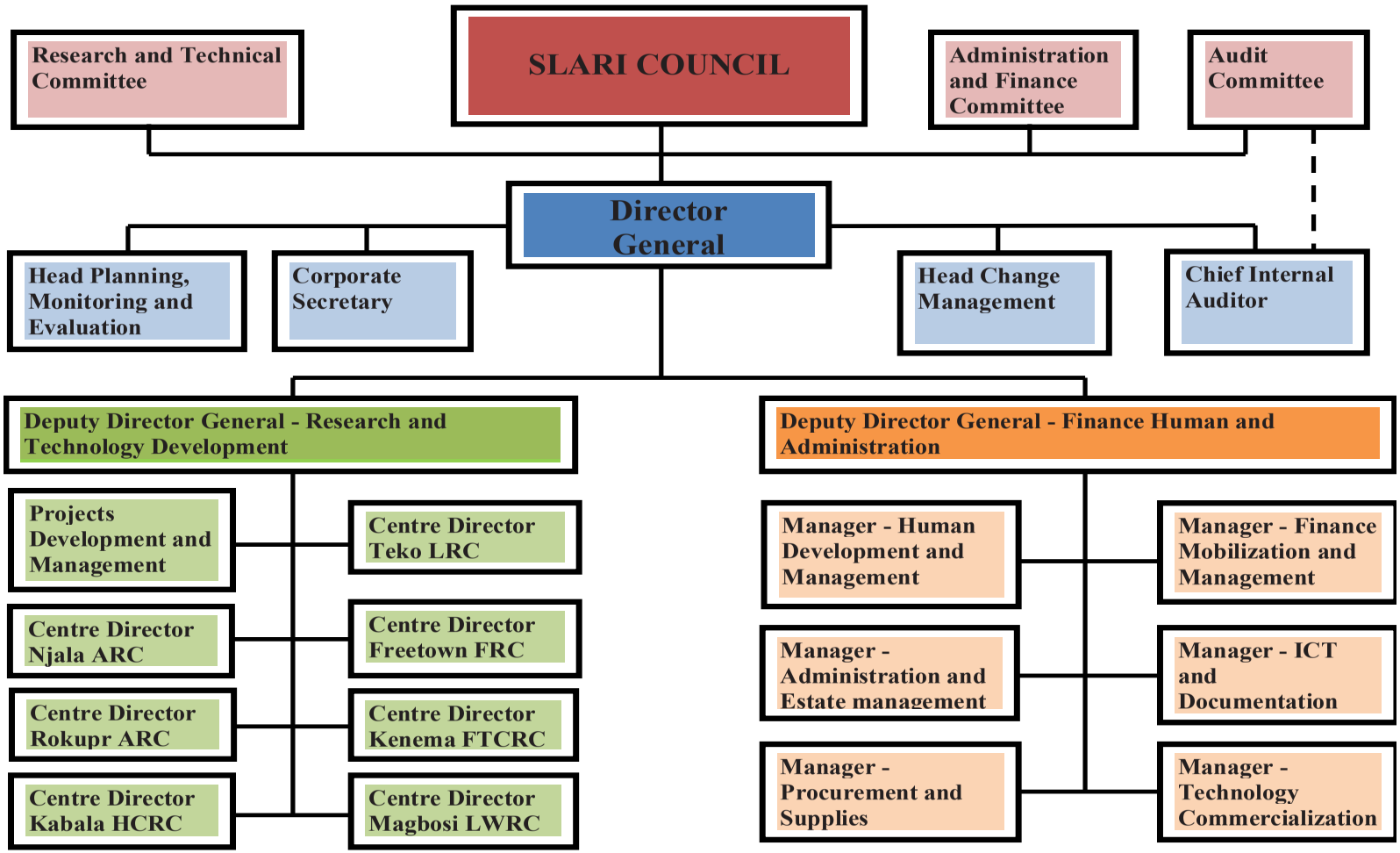
Annex 2: Summary of SLARI institutional current and optimal human resource requirements

SLARI research centres and headquarters		Total SLARI and centre staff requirement by cadres				Total by centre
		Current number of scientists	Optimal number of scientists	Technical support staff	Administrative support staff	
1.0	Njala Agricultural Research Centre	22	54	108	216	**400**
2.0	Rokupr Agricultural Research Centre	19	49	98	196	**362**
3.0	Kabala Horticultural Crops Research Centre	1	32	64	128	**225**
4.0	Teko Livestock Research Centre	4	8	16	32	**60**
5.0	Freetown Fisheries Research Centre	2	17	34	68	**121**
6.0	Kenema Forestry and Tree Crops Research Centre	6	42	84	168	**300**
7.0	Magbosi Land and Water Research Centre	5	19	38	76	**138**
8.0	SLARI Headquarters	4	10	25	15	**54**
Total SLARI staff requirement		**63**	**231**	**467**	**899**	**1,660**

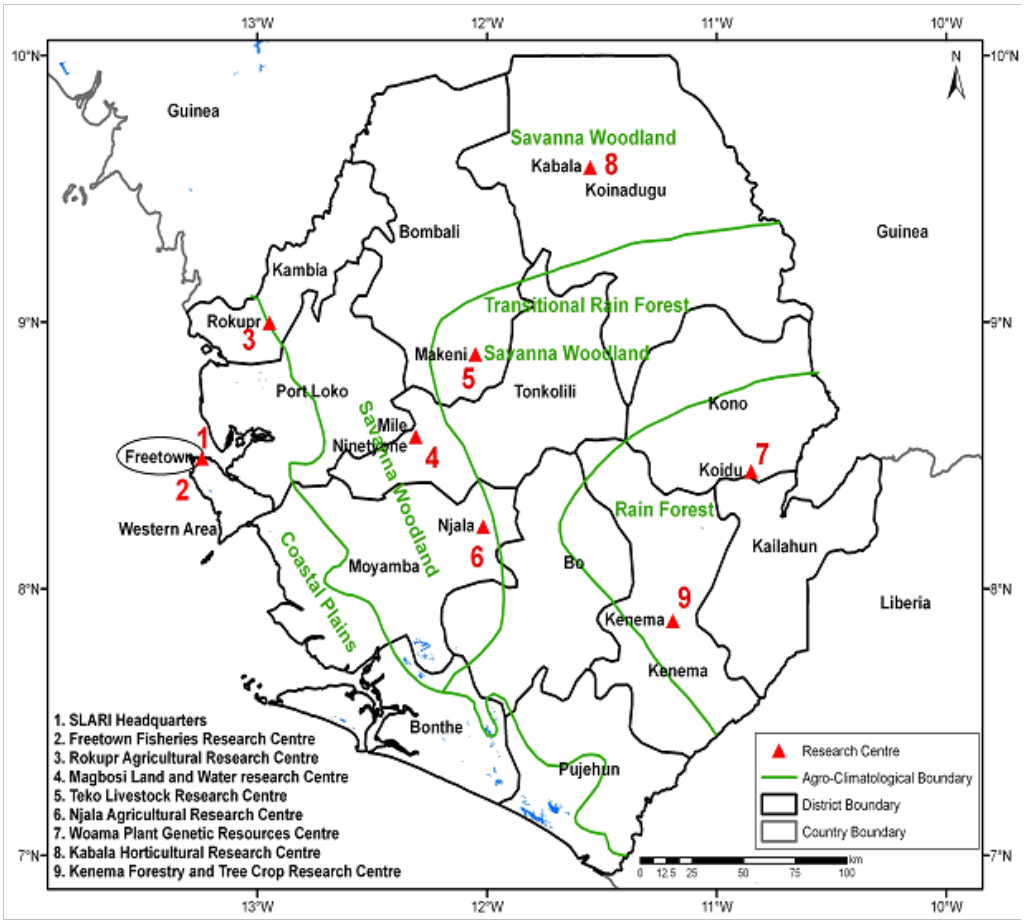
Annex 3: Summary of SLARI institutional financing requirements for the first operational plan period 2012-2016

SLARI research centres and headquarters		Estimated financial resources requirements, USD '000'					
		Research programmes	Human resource	Physical infrastructure	Equipment and related facilities	Research support functions	Total by Centre
1.0	Njala Agricultural Research Centre	24,113.8	16,862.9	3,030.5	8,652.6	526.6	**53,186.4**
2.0	Rokupr Agricultural Research Centre	20,430.1	13,107.0	4,140.0	4,609.0	422.9	**4,2709.0**
3.0	Kabala Horticultural Crops Research Centre	9,865.3	16,529.1	3,750.0	6,141.5	362.9	**36,648.8**
4.0	Teko Livestock Research Centre	2,805.7	7,184.5	2,535.0	12,954.0	254.8	**25,734.0**
5.0	Freetown Fisheries Research Centre	18,459.7	8,106.5	3,005.0	5,180.0	347.5	**35,098.7**
6.0	Kenema Forestry and Tree Crops Research Centre	5,495.0	7,751.9	21,760.0	7,763.3	427.7	**43,197.9**
7.0	Magbosi Land and Water Research Centre	5,798.5	8,397.0	2,252.0	1,243.9	177.0	**17,868.4**
8.0	SLARI Headquarters	0	3,758.6	14,600.0	993.6	286.6	**19,638.8**
Total by category		**86,968.1**	**81,697.5**	**55,072.5**	**47,537.9**	**2,806.0**	**274,082.0**

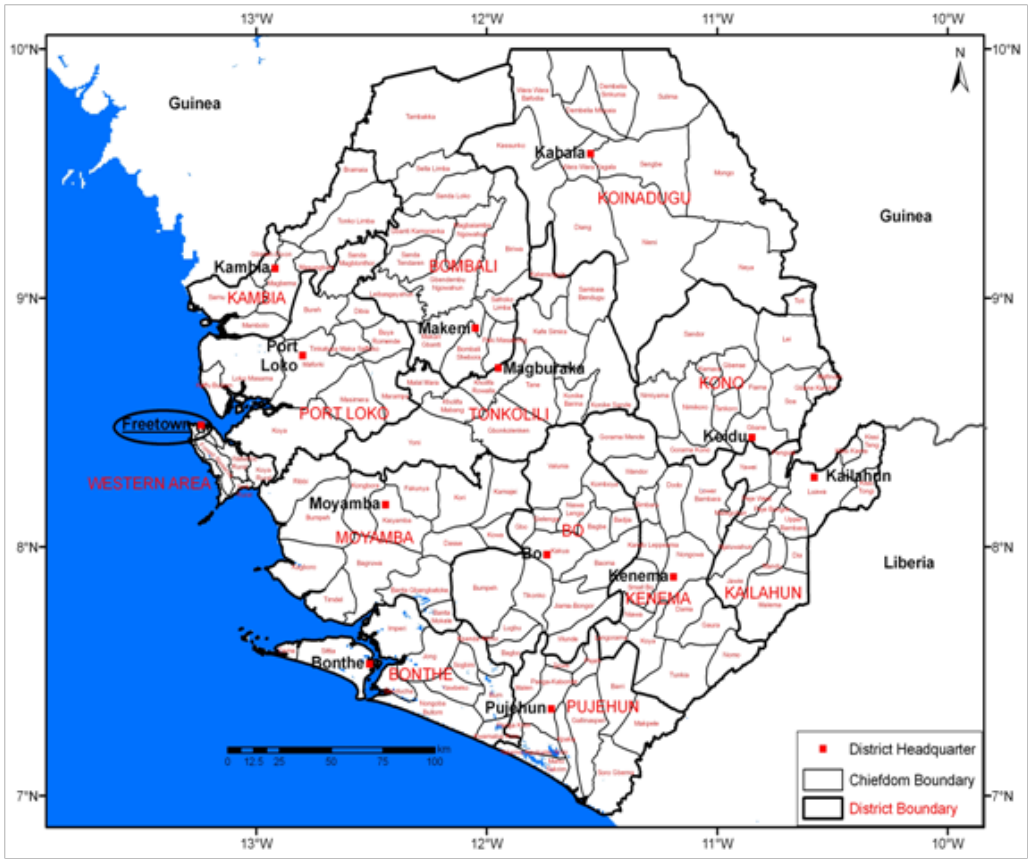
Annex 4: SLARI organizational governance and management structure



Annex 5: Location of SLARI research centres and headquarters



Annex 6: Sierra Leone administrative boundaries



Annex 7: Agro-ecological zones of Sierra Leone

THE REPUBLIC OF SIERRA LEONE

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