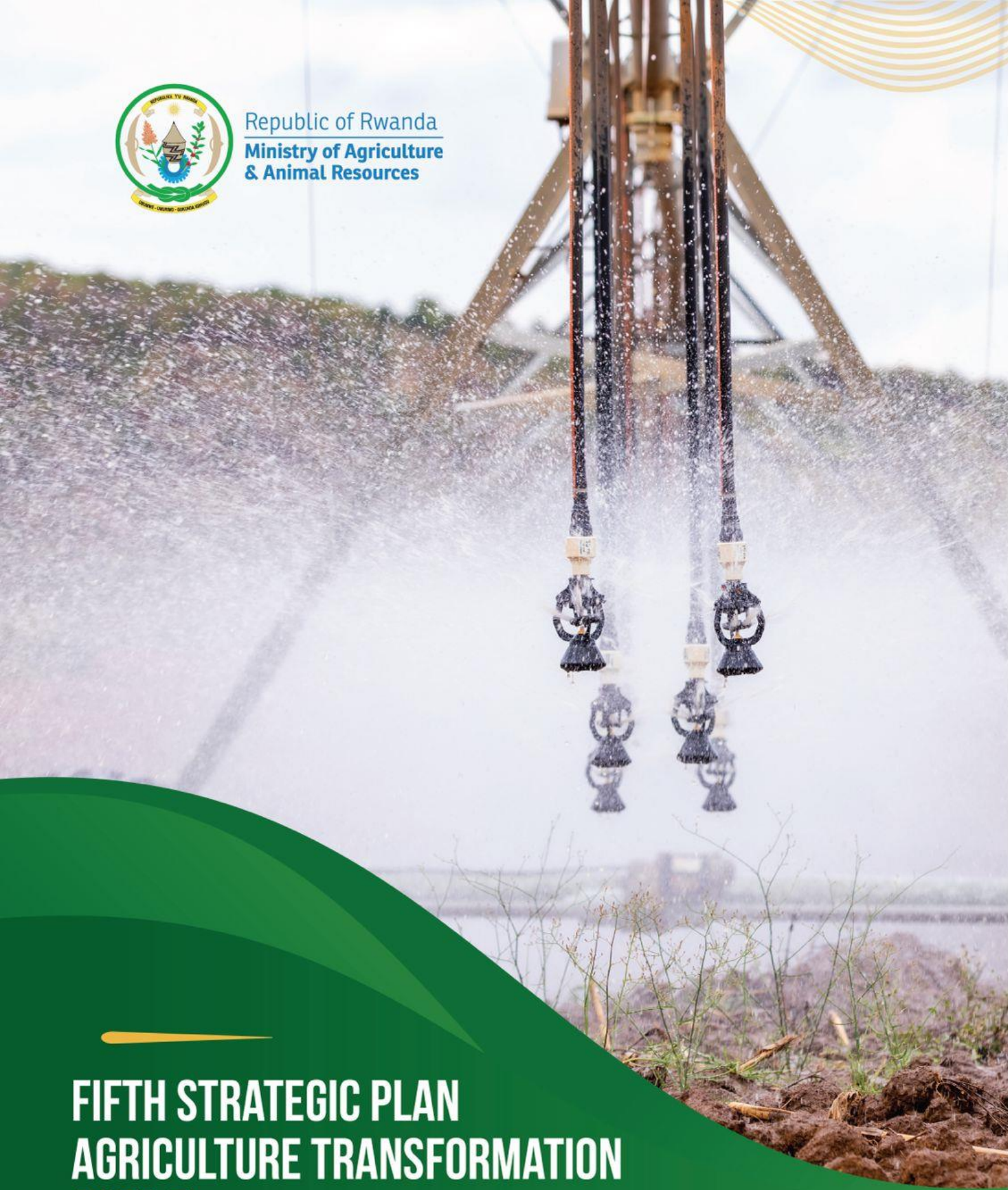
Republic of Rwanda
Ministry of Agriculture & Animal Resources



FIFTH STRATEGIC PLAN AGRICULTURE TRANSFORMATION PSTA 5

Building Resilient and Sustainable Agri-Food Systems

July 2024

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FOREWORD

As we present the fifth Strategic Plan for Agriculture Transformation (PSTA 5), we stand at a critical juncture in Rwanda's agricultural journey. This plan, aptly titled "Building resilient and sustainable Agri-food systems," reflects our commitment to not only continue the progress we have made but to also adapt to the evolving global challenges and national priorities, with a particular focus on improving food security and nutrition in Rwanda while driving the Agri-food systems towards delivering on the country's Vision 2050.

The past few years have brought unprecedented challenges to our nation and the world. The COVID-19 pandemic, global supply chain disruptions, and the escalating impacts of climate change have tested the resilience of our food systems. Yet, these challenges have underscored the crucial role of agriculture in our economy and the importance of a robust, adaptable Agri-food system that ensures food security and nutrition security in a sustainable manner.

PSTA 5 builds upon the foundational achievements of its predecessors, particularly the "Planning for wealth" agenda of PSTA 4. However, it advances further by adopting a holistic Agri-food system approach that places nutrition at its core. This strategy recognizes that our journey to prosperity must be underpinned by sustainability, resilience, and a focus on nutritious food for all.

Our five-year vision in PSTA 5 is ambitious yet achievable. We aim to modernize crops and animal resources production, reduce post-harvest losses, strengthen market linkages, boost exports, and ensure food and nutrition security for all Rwandans. We will harness the power of technology, promote climate-smart agriculture, and create opportunities for our youth and women in the Agri-food sector. Importantly, we will prioritise the production and accessibility of nutrient-dense foods, promote biofortified crops, and implement nutrition-sensitive, environment-friendly practices for both crops and animal resources.

At the core of our strategy are innovative approaches such as the AgriHubs concept, which will concentrate resources to specific production areas and foster synergies among Agri-food systems actors to drive agricultural transformation in Rwanda. We will also leverage private sector engagement more than ever before, recognizing that sustainable growth arises from partnership between government, farmers, and businesses. These partnerships will not only be crucial in developing and distributing nutritious foods and fortified products but in boosting the commercialisation capabilities of our farmers.

As we implement PSTA 5, we remain committed to Rwanda's Vision 2050, the National Strategy for Transformation (NST2) and to the country's international commitments, including the Sustainable Development Goals and the Comprehensive Africa Agriculture Development Programme. Our focus is particularly on SDG 2, which aims to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture.

I invite all stakeholders – farmers, private sector actors, development partners, nutritionists, and fellow Rwandans – to join us in this transformative journey. Together, we can build an agricultural sector that nourishes our nation, drives our economy forward and creates prosperity and good health for all.

Mark Cyubahiro Bagabe (PhD)

Minister of Agriculture and Animal Resources

ACKNOWLEDGEMENTS

The development of PSTA 5 has been a collaborative effort, drawing on the expertise, insights, and dedication of numerous individuals and organizations. We extend our heartfelt gratitude to all who have contributed to this strategic plan, particularly those who have helped shape our Agrifood systems focused approach.

We thank our farmers, whose resilience and hard work form the backbone of our agricultural sector. Their insights and experiences have been invaluable in shaping this strategy, especially in understanding the challenges and opportunities in producing diverse, nutritious crops and animal resources-based products.

We are grateful to our development partners, whose continued support and technical assistance have been crucial in the formulation of this plan. Their global perspective and expertise have enriched our approach.

We thank the private sector stakeholders who participated in our consultations, providing valuable perspectives on needs for de-risking the agriculture sector, market dynamics and opportunities for growth in nutritious food production and distribution.

Special recognition goes to the technical team of the Ministry of Agriculture and Animal Resources, whose tireless efforts in coordinating inputs, analysing data, and drafting this document have been exemplary. Their dedication to integrating the Agri-food systems approach throughout the strategy has been commendable.

Finally, we express our gratitude to the leadership of the Government of Rwanda for their vision and continued prioritization of the agricultural sector as a driver of national development and improved food and nutrition security.

LIST OF ACRONYMS

AMIS	Agricultural Management Information System
BNR	National Bank of Rwanda
CAADP	Comprehensive Africa Agriculture Development Programme
CAES	Customized Agriculture Extension System
CAHWs	Community Animal Health Workers
CFSVA	Comprehensive Food Security and Vulnerability Analysis
CGIAR	Consultative Group on International Agricultural Research
FFS	Farmer Field School
GDP	Gross Domestic Product
ICT	Information and Communication Technology
IFPRI	International Food Policy Research Institute
ISTA	International Seed Testing Association
JADF	Joint Action Development Forum
L-FFS	Livestock Farmer Field School
MCCs	Milk Collection Centres
MCPs	Milk Collection Points
MINALOC	Ministry of Local Government
MINAFFET	Ministry of Foreign Affairs and International Cooperation
MINAGRI	Ministry of Agriculture and Animal Resources
MINECOFIN	Ministry of Finance and Economic Planning
MINEDUC	Ministry of Education
MINICT	Ministry of Information Communication Technology and Innovation
MINICOM	Ministry of Trade and Industry
MININFRA	Ministry of Infrastructure
MOE	Ministry of Environment

MOH	Ministry of Health
NAEB	National Agricultural Export Development Board
NAIS	National Agriculture Insurance Scheme
NISR	National Institute of Statistics of Rwanda
NSGR	National Strategic Grain Reserve
NST	National Strategy for Transformation
OECD	Organisation for Economic Co-operation and Development
PPP	Public-Private Partnership
PSTA	Strategic Plan for Agriculture Transformation
RAB	Rwanda Agriculture and Animal Resources Development Board
RDB	Rwanda Development Board
RFDA	Rwanda Food and Drugs Authority
RICA	Rwanda Institute for Conservation Agriculture
RICA	Rwanda Inspectorate, Competition and Consumer Protection Authority
RSB	Rwanda Standards Board
SDGs	Sustainable Development Goals
STEM	Science, Technology, Engineering, and Mathematics
TVET	Technical and Vocational Education and Training
UPOV	International Union for the Protection of New Varieties of Plants

EXECUTIVE SUMMARY

Rwanda's agriculture sector remains the bedrock of the economy and is pivotal for inclusive wealth creation, food security, and social transformation as the country strives to become a knowledge-based, high-income economy by 2050.

However, the sector faces significant challenges, including the impacts of climate change and global shocks that have disrupted food prices and availability in recent years. To address these challenges and capitalize on opportunities, the Strategic Plan for Agriculture Transformation (PSTA 5) for 2024/25–2028/29 aims to build resilient and sustainable Agri-food systems that support Rwanda's continued economic and social progress.

The PSTA 5 adopts a holistic Agri-food systems approach, recognizing the interconnections between agriculture and other sectors, such as health, environment, trade, and infrastructure. Guided by a robust theory of change, the strategy emphasizes connecting farmers to attractive markets as the cornerstone for unlocking the potential of the Agri-food system. By reducing post-harvest losses, strengthening value chains management and linking farmers to lucrative markets, the strategy anticipates boosting their incomes and food security, enabling investments in better inputs, technologies, and practices that enhance production, mitigate risks (including climate risks) and generate jobs across value chains.

This transforms agriculture into a stronger economic activity that fuels the entire Agri-food system, improving food availability, access, and stability for consumers, leading to better food security and nutrition outcomes at national level. The increased cash flow also enables farmers and other actors to access and benefit from critical enabling services such as research, extension, finance, insurance, and digital solutions, further bringing better agriculture incomes.

The PSTA 5 provides a comprehensive framework to guide this collaborative effort to transform Rwanda's Agri-food systems for a more prosperous, food secure, and resilient future. Its total estimated cost is 6,406.5 billion RWF, with 43.7% expected to come from private sector investments. The strategy's budget is allocated across three priority areas:

1. Modernization of Agriculture and Animal Resources Production for Climate Resilient Agri-food Systems (58.6% of the budget)
2. Inclusive Markets and Post-harvest Management for Sustainable Agri-food Systems (17.5%)
3. Strengthening Agri-food Systems Enablers for Effective and Efficient delivery (23.9%)

This total budget also includes contingencies to ensure flexibility in adapting to unforeseen circumstances and price fluctuations.

The forward-looking economy-wide simulation analysis underscores the transformative potential of PSTA 5. Under a full-funding scenario, results suggest that by 2028/29 agricultural GDP growth could significantly exceed the targeted 6.1 %. Exports are projected to surpass USD 1.5 billion, while the sector would also make a meaningful contribution to reducing undernourishment which is an essential pathway for tackling childhood stunting.

1. PSTA 5 OUTCOMES

1 Modernization of Agriculture and Animal Resources Production for Climate-Resilient Food Systems

1.1 Modernized crop production and productivity aims at promoting climate smart practices, improved inputs while leveraging the capacity of women, youth, and the private sector.

1.2 Modernized animal resources production and productivity addresses key challenges and opportunities related to animal husbandry practices, breeding, animal health, affordable feeds, finance, and relevant infrastructure for production and value addition.

2 Inclusive Markets and Post-harvest Management for Sustainable Agri Food Systems

2.1 Boosted Agriculture Exports increases the branding and value of exports as well as production volumes.

2.2 Strengthened Market Linkages and Post-Harvest Infrastructures aims to link the 2.3 million farming households to markets, post-harvest infrastructure, quality and safety standards, value addition, and trade infrastructure.

2.3 Improved Food Security and Nutrition targets the promotion of stable availability, access, and utilization of a safe, nutritious, and varied diet.

3 Strengthening Agri-Food Systems Enablers for Effective and Efficient Delivery

3.1 Strengthened Research and Technology Transfer for Agri-Food Systems Transformation entails numerous programmes related to research and innovation to improve support functions.

3.2 Strengthened Agriculture De-Risking for Resilience aims to stimulate the supply and demand of attractive agriculture insurance products.

3.3 Digitized Agri-Food Systems entails digitalizing the agriculture sector at farm level, in value chains, and institutions for better access to information and data.

3.4 Strengthened Agri-Food Systems Planning and Coordination to drive transformation underscores the importance of institutional capacity and synergized coordination to deliver results in Rwanda's agri-food systems.

2. EXPECTED IMPACT

1.

Legend: Baseline Target

Inclusive Economic Transformation

2%		Agriculture growth	>6%
857 Million USD		Agriculture exports revenue	1,540 Million USD
72%		Women in agriculture with adequate empowerment	100%
400,000		Off-farm jobs in agri-food systems	644,204

Improved Food Security and Resilience

79.6%		Percentage of food secure HH (CARI indicator)	88%
32.4%		Stunting rate	15%
5.5		Dietary diversity score	8.0
79.6%		Food self-sufficiency ratio	100%

Investment needed
6,406.5 Billion
Rwandan Francs

Introduction

1. Introduction

1.1 The role of the Agri-food systems in Rwanda

The agriculture sector remains the backbone of the Rwandan economy and the key to socio-economic transformation as the country continues to transition towards a knowledge-based high-income economy by 2050. Close to 69% of households are engaged in agriculture[1] and an estimated 400,000 people are employed in the Agri-food systems. The sector is also crucial for social transformation, women's economic empowerment and youth employment. Agriculture development contributed to about two thirds of the poverty reduction achieved between 2001 and 2017.[2] In 2023, the sector contributed 27% of GDP[3] and about 34% of exports.[4] As the country transforms to an upper-middle income country by 2035 and a high-income economy by 2050, agriculture will continue to play a prominent role in both economic growth and poverty reduction.

Apart from the economic significance, agriculture lies at the heart of delivering food and nutrition security for the growing population to fuel national transformation in the decades to come. PSTA 5 will be implemented with an Agri-food systems approach implying that actors and interlinked activities which add value in agriculture production and related off-farm interventions play an essential role in producing and bringing food from the field to consumption. These actors also serve as the main contributors to stable and predictable access to safe and nutritious food in the country. Safe and nutritious food are essential for reducing food insecurity, malnutrition, and childhood stunting, and hence secure a healthy population today and in the future.

There is a significant demand to produce more nutritious food which calls for efficient and effective use of the scarce land resources. Rwanda is one of the smallest and most densely populated countries on the African continent with over 72% of the population living in rural areas.[5] The country has a population of 13.2 million of which 8.6 million are aged below 30 years,[6] and it is projected to grow to 22.1 million by 2050 which will substantially increase the demand for food. Hence the imperative need to improve land productivity, protection of agriculture land from encroachment,[7] and to use currently unused land for production, where suitable.

Over the past few years, food security came under significant pressure as Covid-19, and other global shocks unfolded. At the beginning of the Covid-19 pandemic, when international trade was disrupted and household incomes declined, Rwanda had to rely on its stored commodities to feed its population and the percentage of food secure households declined slightly to 79.4% in 2021 versus 81.3% in 2018 and 80.5% in 2015.[8] Furthermore, in 2022 there was a major spike in the global prices of fuel and food commodities.[9] In Rwanda, food insecurity was further exacerbated by droughts and severe dry spells events, which caused the inflation of domestically produced food products, reaching unprecedented levels in 2022 and 2023.[10]

The future is likely to witness further disruptions because of the escalating effects of climate change and other factors. Firstly, the impact of climate change in the form of droughts, floods, and

1 NISR, Fifth Population and Housing Census, 2022

2 Government of Rwanda, 2020, Vision 2050. In this period, the poverty rate reduced from 58.9% to 38.2% according to the National Household Survey, EICV 1-5

3 NISR, National Accounts 2023

4 MINAGRI Annual Report, 2022/23

5 NISR, 2023, Fifth Population and Housing Census, 2022

6 NISR, 2023, Fifth Population and Housing Census, 2022

7 PRESIDENTIAL ORDER N° 038/01 OF 20/05/2022 ESTABLISHING THE NATIONAL LAND USE AND DEVELOPMENT MASTER PLAN, page 53 (72).

8 NISR, CFSVA 2021

9 IFPRI. (2022a). Russia-Ukraine war: After a year, impacts on fertilizer production, prices, and trade flows.

10 NISR, Consumer Price Index, 2023

soil erosion has been profound over the past decade and is projected to intensify in the future.[11] Secondly, population growth and the need for increasing food supplies, despite the scarcity of land. Thirdly, potential future shocks in global markets cannot be ruled out.

Consequently, intensified efforts toward Agri-food systems transformation will be critical for future national development. Considering recent events and future trends, rapid and profound transformation of the Agri-food systems is required. Firstly, to increase production efficiency and sustainability, it is imperative to integrate advanced agricultural technologies and practices. This involves strengthening the linkages between Agri-food systems actors including inputs and farm machinery suppliers, animal feed producers, farmers, processors, and markets. Secondly, investing in agriculture value chains is crucial for improving the quality, safety, economic and nutritional value of food and non-food products. This requires reducing post-harvest losses, improving storage and cold-chain facilities, enhancing food processing capabilities, ensuring efficient waste management, as well as the use of relevant economy wide models. Thirdly, to empower the rural population, especially farmers, women and youth, people with disabilities, through inclusive education, training, and access to finance and user-friendly technologies, will be key to driving innovation and entrepreneurship in the Agri-food systems.

As we approach 2050, the role of agriculture and the Agri-food systems in Rwanda's socio-economic context will evolve. While the sector's contribution to GDP may decline in relative terms, its importance in ensuring food security, driving social transformation, and contributing to sustainable development will only grow. The government, together with its development partners, must therefore prioritize implementing Agri-food systems in-line with the government's development agenda, leveraging the sector's potential to address the challenges in a sustainable and resilient way.

Against this backdrop the fifth edition of the Strategic Plan for Agriculture Transformation (PSTA 5) has been themed: "Building resilient and sustainable Agri-food systems". The PSTA 5 builds upon the "Planning for wealth" agenda of PSTA 4 and maintains the Ministry's ambition of transforming agriculture towards prosperity, green, and market driven goals. However, the past few years have highlighted that sustainability and resilience are preconditions for longer term wealth creation.

In a world that is becoming more volatile, agriculture transformation needs more comprehensive strategies that consideration the multifaceted nature of the sector, exogenous factors, and global events. PSTA 5 therefore emphasizes the need to consider broader Agri-food systems and climate resilience to achieve national economic development as well as food and nutrition security objectives. This involves recognition of the required substantial resources, and more importantly the need to strengthen the interlinkages between agriculture development and other areas such as health, environment, commerce, finance, ICT, education, gender equality and youth empowerment. This is comprehensively reflected in the PSTA 5 design.

1.2 Policy context

The PSTA 5 is the overarching agriculture sector plan, and it will implement the second edition of the National Strategy for Transformation (NST-2) spanning the 2024-2029 period. PSTA 5 is designed to make significant progress toward the country's overall target of achieving high-income status by 2050 and upper-middle income status by 2035. To achieve this, labour productivity in agriculture will need to increase manifold from its current levels, and agriculture production will employ fewer people than today. The transition is to be gradual and with particular attention paid to youth and gender specific impacts.[12]

Going into 2050, Rwanda envisions agriculture to be "totally transformed with professional farmers and commercialized value chains.[13] Specifically, the Vision's third Pillar, "Agriculture for Wealth Creation" outlines four strategic targets: Firstly, a transition to a modern market oriented and climate resilient agriculture; secondly, a scaled-up use of modern inputs and technologies to maximize

11 FAO. 2023. The State of Food Security and Nutrition in the World 2023. Page 32, 244

12 GoR, 2020, Vision 2050

13 GoR, 2020, Vision 2050

productivity; thirdly, increased access to agriculture finance and risk sharing facilities; and, finally, integration with global value chains of higher value products. Vision 2050 also highlights some key considerations for success. For example, consistency in prioritization, increasing the role of the private sector, deepening regional integration, and adopting an unconventional approach to go beyond the "business-as-usual" development.

The strategy also considers key national priorities reflected in Rwanda's National Determined Contributions 2020, Revised Green Growth Climate Resilience Strategy, the National Land Use Master Plan 2020-50, the 2-Years Multisectoral Plan for to Accelerate Stunting Reduction, the National Disaster Risk Management Policy, the National Strategy for Sustainable Graduation, and others.

Moreover, the PSTA 5 integrates high-level components from several agricultural sub-sector strategies and studies developed over the past years. These strategies include, the Rwanda Irrigation Strategic Plan, National Agriculture Financial Services Strategy, Post-Harvest Management Strategy, Livestock Development Strategy, National Agriculture Digitization Strategy, National Agriculture infrastructure Management Strategy, National Agriculture insurance Scheme, Leveraging Private Sector Strategy, Management of Agri PPDs and Value Chain Platforms Mechanisms in Rwanda, National Aquaculture Strategy for Rwanda, Rwanda Beekeeping Development Strategy, Nutrition Sensitive Agriculture Mainstreaming Guidelines, Gender and Youth Mainstreaming Strategy, and others. In addition, existing laws, and regulations relevant for agriculture, such as the Land Law, Seed Law, PPP Law, the Investment Code, and others were considered.

At the international policy nexus, Rwanda's agricultural strategies are compliant with the Comprehensive Africa Agriculture Development Programme (CAADP) [14] and SDGs, EAC Agriculture and Rural Development Strategy, and the AfCFTA. The pan-African CAADP initiative offers a unified vision for rejuvenating agricultural growth, fortifying food security, and galvanizing rural development. Additionally, the strategy underscores its commitment to the United Nations' Sustainable Development Goals (SDGs), particularly Goal 2, which emphasises ending hunger, achieving food security, improving nutrition, and promoting sustainable agriculture. This calls for a transformation in Agri-food systems in ways that ensure the delivery of safe, low cost, nutritious foods and consumption of healthier diets. By harmonising the PSTA 5 with the SDGs, the Government of Rwanda reinforces its pledge to not just uplift its own populace but also contribute constructively to other global goals including SDG 5 on Gender equality, SDG 8 on decent work and economic growth, SDG 12 on responsible production and consumption, SDG 13 on climate action and SDG 14 on life below water.

Formulation process of PSTA 5

The PSTA 5 formulation process was designed in a consultative manner using evidence-based inputs. Implementation of PSTA 5 will require a multitude of stakeholders, and therefore, significant efforts have been made to make the strategy formulation inclusive and participatory while responding to National, Regional, Continental and International policy directives.

The process is aligned to the guidelines for Cabinet papers, which requires a consultative process at local and central levels. To ensure alignment and coherence, the strategy was formulated in alignment with Rwanda's Vision 2050, National Agriculture Policy and other preceding documents. It also took into consideration international commitments, such as the CAADP agreements and the Sustainable Development Goals (SDGs).

The document considered data from relevant existing sources including the PSTA 4 mid-term review (MTR), prior strategic documents, research papers, Laws and Regulations, and reports. Furthermore, sub-sector strategies at various stages of development and approval were reviewed and considered in the PSTA 5. Additionally, publicly available datasets on production, consumption, trade, labour, food balance sheet, food security etc. were collected from the National Institute of Statistics Rwanda (NISR) and analysed. This allowed for a holistic understanding of the historical and current context, challenges, and the progress made in the Agri-food systems.

14 Fourth CAADP Biennial Review, 2023

Primary data was collected primarily through meetings and consultations and organized consultations across all provinces with representatives from all districts were undertaken. Focus group discussions with farmers and value chain actors were held. To be inclusive, special focus group discussions with women and youth were organized separately. Moreover, civil society, the private sector, and development partners have been consulted through the Agriculture Sector Working Group. A three-days knowledge seminar was held in November 2023 with national and international experts informing the strategy on national and global challenges to the Agri-food systems. Furthermore, each draft of the PSTA 5 was shared with agriculture stakeholders for enrichment and comments. The present document took into consideration inputs from all agriculture sector members. Consultations with government institutions, relevant for the Agri-food systems transformation, have been held to allow for joint planning and working as well as closer interaction during implementation. The consultations included institutions from key sectors relevant to the Rwanda's Agri-food systems like health, environment, trade and industry, infrastructure, and others. Additionally, a year-long training programme on food systems is being conducted for civil servants across relevant institutions to underpin the envisioned transition to a more holistic implementation approach.

Outline of the document

The PSTA 5 document aspires to paint a comprehensive picture of the Agri-food systems and the strategic priorities to improve performance both from the macro-perspective and for specific topics.

The document has the following structure. The Sector Overview and Performance reports on the situation in the Agri-food systems at a macro level over the past 5 years and considers challenges and opportunities for future success. This informs the overall goals and the Theory of Change. The subsequent strategic framework is divided into three priority areas. Priority Area 1 considers the supply side of the Agri-food systems and is aimed at increasing agricultural production through more climate resilient practices and technologies. Priority Area 2 considers the markets side, i.e. the agriculture value chain and consumption aspects for sustainable food systems. Finally, Priority Area 3 considers the systemic enablers which strengthen the Agri-food systems overall. Each Priority Area contains outcomes and outputs defining the planned activities under PSTA 5. Each output is informed by a situational assessment related to the specific topic and outlines priorities in the area.

2. Sector overview and performance

The PSTA 5 emphasises a food systems approach. Hence the following sub-section provides an overview of the Agri-food systems and the key actors, followed by a review of sector performance during PSTA 4 period with respect to the contribution toward economic development and improving food security and nutrition outcomes.

2.1 Agri-food systems overview

With PSTA 5, Rwanda has committed to a food systems approach, recognizing its fundamental role for the economy and for securing sustainable availability, access to nutritious and healthy diets for all while empowering Agri-food systems actors.

The Agri-food systems encompass the entire range of actors and their interlinked value-adding activities. Agriculture is closely linked to sectors like environment, health, infrastructure, trade, finance, technology, local administration and education, all vital for food security and transformation. Environmental ties include climate change, land use, and ecosystems. Key health-related actions involve water, sanitation, hygiene (WASH), food safety, and school feeding programs. Skills development and capacity building are essential for sustainability. Infrastructure, including roads, electricity and markets that connect agriculture to services and trade. Trade, in turn, drives the export and import of agricultural goods by integrating local and global markets.

Farming plays a significant role in Agri-food systems giving employment to 3.5 million farmers. Out of these, 1.78 million derive their main livelihood from subsistence farming, and 1.72 million are market oriented[15]. Men have a significantly higher propensity to be engaged in market-oriented agriculture than women (55% vs 44%). Additionally, the wider food-systems, beyond primary production, employs about 400,000 people and contributes approximately USD 1.1bn to GDP.[16] Workers in trade, transport, agro-processing, food services, input supply, food preparation etc, connect farmers to markets and are essential for agriculture transformation through backward and forward linkages.

The majority of farmers do mixed farming systems combining crops and animal production.[17] Beans are the most common crop farmed by 79.9% of the households followed by other staples: maize, cassava, and sweet potato.[18] The most common animal is cows, which is reared by 925,808 households, followed by goats, pigs, and chicken.[19] With small and decreasing landholdings, households are gradually shifting this composition towards smaller animals. Fruits are produced by 65% of the households, whereas only 15% of households grow vegetables[20] (infographic 5).

Because farming households are heterogenous, farm typologies based on different characteristics, needs, and opportunities should be considered. About 58% of farmers are women, and 95% of farmers reside in rural areas[21]. Youth (age 16-30) constitute 32% of farmers and two thirds of farmers are younger than 46 years of age. Whereas, farmers have less formal education than the rest of the population, youth-farmers have significantly more education than non-youth farmers (infographic 4). These differences must be given consideration in programmes aimed towards strengthening household resilience. For example, small-holder subsistence farmers are more vulnerable to climate change impacts than commercial farmers who can afford agro-insurance and protective measures.

15 Labor Force Survey Annual Report, 2023.

16 IFPRI, 2022, Measuring Changes in Rwanda's Agri-food systems

17 NISR, 2023, Fifth Population and Housing Census 2022

18 NISR, 2023, Fifth Population and Housing Census 2022

19 NISR, 2023, Fifth Population and Housing Census 2022

20 NISR, 2023, Fifth Population and Housing Census 2022

21 NISR, Labour Force Survey, 2023

3. OVERVIEW OF THE CURRENT AGRI-FOOD SYSTEMS

Environment
- Climate change
- Land
- Ecosystem services

Infrastructure & technology
- Roads
- Aggregation and markets
- Electricity & water

Rules & regulations
- Laws and regulations
- Food quality & safety
- Subsidies

Society
- Skilled labor
- Cultural norms

Input supply

% of landsize - 2023

55%	Pesticides
35%	Inorganic fertilizers
73%	Organic fertilizer
28%	Improved seeds

- Inputs supply has **10k workers** and contributes **50M USD** to the economy
- Inputs such as fertilizers and pesticides are mainly imported and distributed by agro-dealers.
- Subsidies such as SMART Nkunganire enable access to these inputs.

Farm production

1,660,185 Market oriented farmers

1,759,278 Subsistence farmers

- Predominantly smallholding with average farm size of **0.4 ha**.
- Food crops such as beans, maize, and cassava are the most cultivated crops.
- Cows and goats are the most reared livestock.
- Agricultural production accounts for **25%** of Rwanda's economy.

Processing & packaging

- Agro-processing contributes **583 million USD** to Rwanda's economy
- Agro-processing has **170K workers**
- Small processors dominate food producers.
- Bakery, cereals and alcoholic beverages are the main products.
- RICA, FDA and RSB – bodies in charge of standards and policies

Transport and trade

- Trade and transport tailored to agri-food systems employs about 140,000 workers
- It contributes 210 million USD to the economy.

Hotels and restaurants

- The subsector employs **30,000 workers**.
- It contributes **261 million USD** to the economy.

Exports

- Rwanda mainly exports tea, coffee, horticulture, animals and animal products.
- In 2023, agriculture exports revenue amounted to **857 million USD**, a **38%** increase from **2018**.

Home consumption

- On average only **32% -38%** of food crop produce is sold to a market
- About **73%** of households have acceptable food consumption.

Environment
- Biodiversity
- Low emissions

Livelihoods improvement
- Private sector development
- Youth & women employment
- Incomes

Food security & nutrition
- Food diversity
- Food availability
- Food sovereignty

Source: NISR, LFS, 2023; IFPRI, Rwanda's Agrifood Syste m, 2022; NISR, National Accounts, 2023

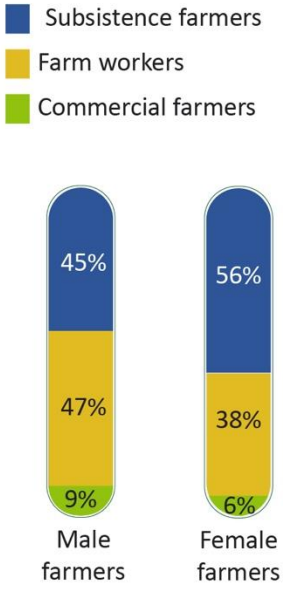
4. FARMERS PROFILE

i. Type of farmers

Agriculture serves as the primary livelihood for most of the population, engaging around 3.4 million working-age individuals. Within this sector, the largest portion comprises subsistence farmers, totaling 1.7 million, followed by farm workers at 1.4 million. Commercial farmers account for 7% of agriculture workforce.

ii. Farming types by sex

Female farmers demonstrate a higher propensity for engaging in subsistence farming compared to their male counterparts.



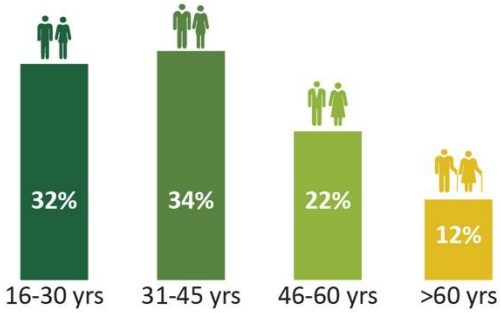
Source: NISR, Labor Force Survey, 2022

Farmers are predominantly located in rural areas, with a tendency towards being female, aged under 45.

iii. Sex of farmers

iv. Residence

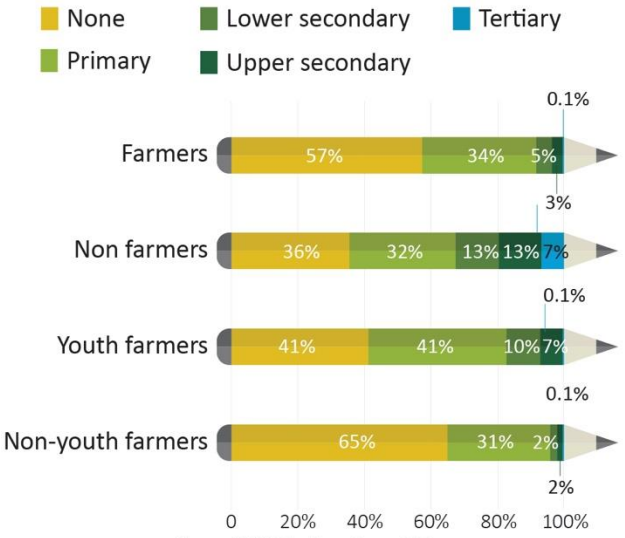
v. Age of farmers



Source: NISR, Labor Force Survey, 2022

vi. Education attainment

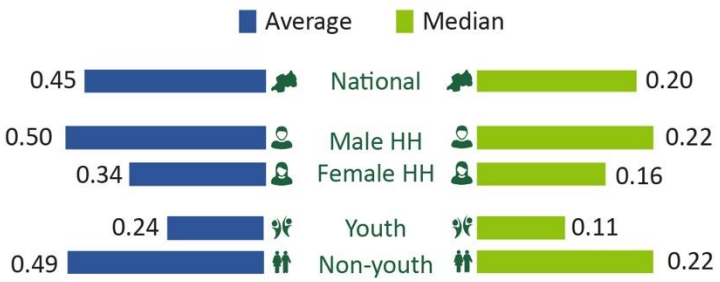
Farmers generally have lower levels of education compared to the national average, with the disparity being more pronounced among non-youth farmers.



Source: NISR, Labor Force Survey, 2022

vii. Land ownership

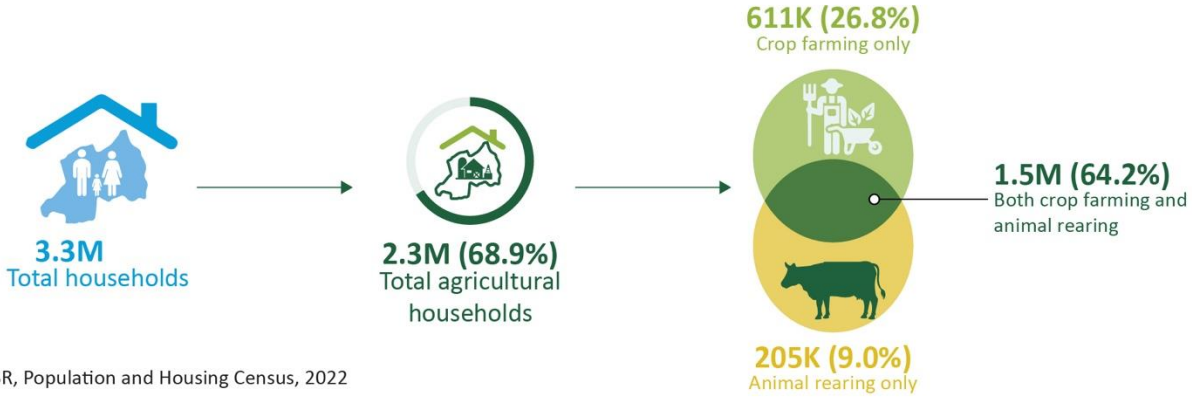
In Rwanda, the average landholding is 0.4 ha, and half of the agricultural households own less than 0.2 ha. Male and non-youth headed households own relatively larger plots of land. Small farm size contributes to the sector's low productivity.



Source: NISR, Agriculture Household Survey, 2020

I. Agriculture household

Over two-thirds of households in Rwanda rely on agriculture. Most agricultural households are farming both animals and crops.



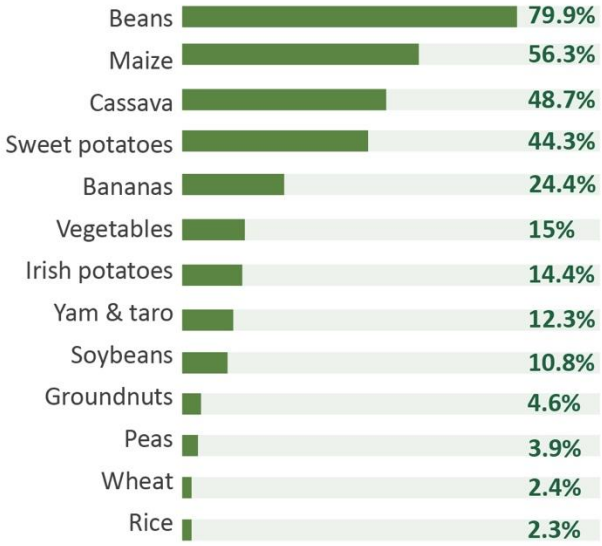
Source: NISR, Population and Housing Census, 2022

II. Crops farming

Most households engaged in crop farming focus on cultivating staple crops, notably beans, maize, cassava, and sweet potatoes. While approximately two-thirds of these households grow fruits, only 15% cultivate vegetables. Cash crops continue to be cultivated by a small percentage of households.

2.1M (62.6%)
All crop farming households

IV. Food crops farming



V. Fruit farming

65%
Fruit farming households

62% Avocado
17% Papaya
26% Mango
11% Guava

VI. Vegetable farming

15%
Vegetable farming households

10.6% Amaranths
3% Cabbage
2.5% Eggplant

vii. Cash crops farming

6.5% Coffee
0.8% Tea
0.3% Pyrethrum

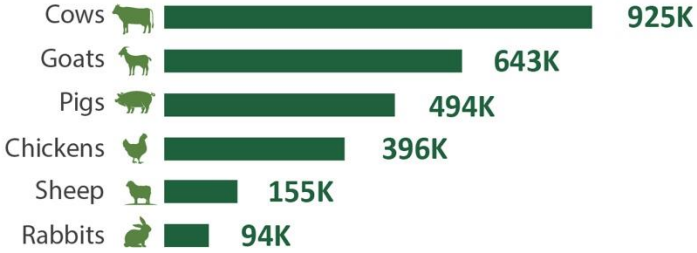
Source: NISR, Population and Housing Census, 2022

VIII. Animal farming

Animal farming is practiced by 1.6 M households with cows being the most common animal reared by 925K households. This is followed by goats, pigs, chickens, sheep, and rabbits.

1.7M (50.4%)
All animal farming households

Number of households farming:



Source: NISR, Population and Housing Census, 2022

2.2 Agri-food sector performance in the PSTA 4 period

2.2.1 Contributions to incomes and the economy

Agriculture gross value added increased by 3.1% per year on average in the 2018-2023 period compared to overall GDP growth of 6.5%. Whereas food crops are still the largest sub-sector at 62% of total agriculture production, animal production saw remarkable growth of 9% per year since 2018. Food crops saw 2.5% growth since 2018, which is lower than the preceding decade – annual growth in food crops between 2008-2018 was 5.5%. After the implementation of the Crops Intensification Programme, agriculture yields improved substantially, but the effect has diminished since approximately 2013[22]. Export crops have seen a slight decline during the PSTA 4 period, mainly due to the pandemic, international prices of coffee and tea, and stagnating domestic production volumes and yields of the major crops.

Agriculture proved more resilient than the rest of the economy during the Covid-19 pandemic. In 2020, the agriculture gross value-added increased by 1% compared to an overall decline in national GDP of 3.4%, and the sector absorbed about 450,000 additional workers during that year[23].

Agriculture remains the main source of employment and livelihoods, but productivity is low. As seen in the previous section, agriculture primary production employs over 3.4 million people[24] and creates livelihoods for 69% of households[25]. However, agriculture gross value added is RWF 0.72 million/worker/ year compared to 3.19 million in industry and 3.36 million in services[26]. With a growing labour force, it is critical to increase agriculture sector productivity as well as creating off-farm opportunities in the wider Agri-food systems where productivity and wages are higher[27].

The PSTA 4 period saw improved uptake of good agricultural practices between 2018 and 2023. The share of farmers using inorganic fertilizers increased from 22% to 56% with applications increasing from 32 kg/ha to 70 kg/ha. Meanwhile, organic fertilizer uptake increased from 44% to 86%[28]. The use of improved seeds increased from 9% to 29% and the use of pesticides from 17% to 33%.[29] From 2022, the global rise in input costs posed significant challenges, limiting farmers' access to fertilizers[30]. In response, the government adjusted fertilizer prices and subsidies, taking on a larger share of the price increases to shield farmers from market volatility[31].

Integrated soil land husbandry and water management measures were applied and strengthened during PSTA 4 to mitigate the climate change impact. By 2023, 92% of farmers were using anti-erosion control measures versus 68% in 2018 with the area under radical terraces increasing from 110,905 ha to 138,579 ha. The area developed for irrigation increased to 71,585 ha. by 2023 with the percentage of farmers using irrigation doubling from 5% to 10%[32].

22 MINAGRI, National Agriculture Policy 2018

23 NISR, Labour Force Survey

24 NISR, Labour Force Survey

25 NISR, Fifth Population and Housing Census, 2022

26 Calculated as Real GDP (2017) prices per worker according to the Labour Force Survey.

27 NISR, Labour Force Survey

28 NISR, Seasonal Agriculture Survey

29 NISR, Seasonal Agriculture Survey

30 IFPRI source: https://www.ifpri.org/blog/russia-ukraine-war-after-year-impacts-fertilizer-production-prices-and-trade-flows

31 IFPRI, 2022: "*Expected impacts of increases in international prices of fertilizer in Rwanda*" Source: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/135073/filename/135287.pdf.

32 NISR, Seasonal Agriculture Survey

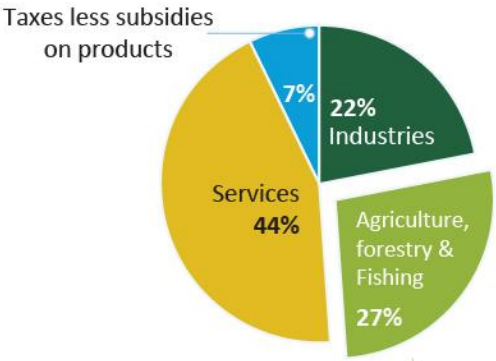
6A. AGRI-FOOD SYSTEMS PERFORMANCE

I. Gross VALUE ADDED

In 2023, Rwanda's economy reached a value of 16 billion USD, with agriculture accounting for 27% of its total size. Food crops remain the dominant sub-sector at 62% of agriculture gross value added.

Rwanda's GDP

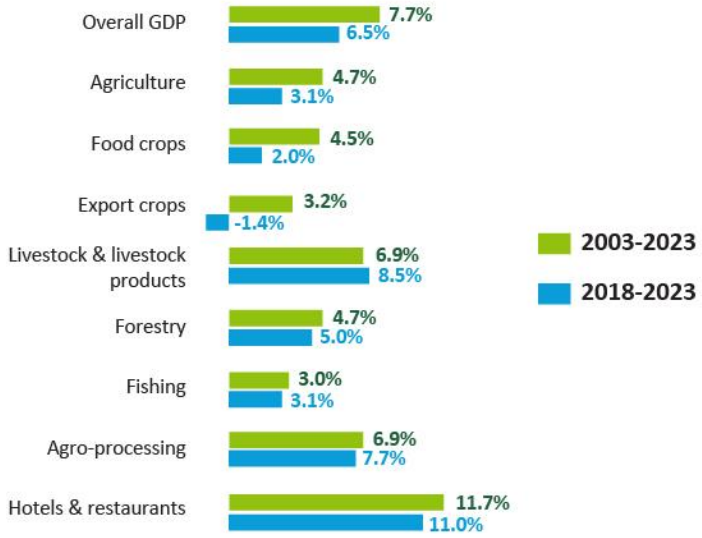
16 Billion USD



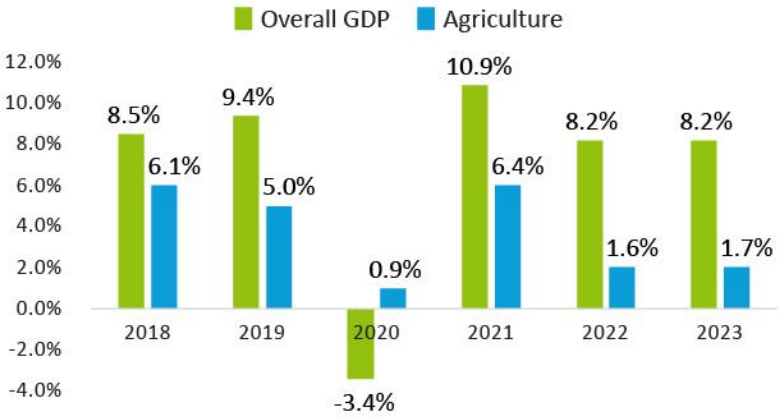
Source: NISR, National Accounts, 2023

II. Growth of agri-food systems subsectors

The agricultural sector increased by 3.1% per year in the 2018-2023 period in contrast with 6.5% per year in overall GDP. Amongst agriculture's sub sectors, livestock and livestock products have been growing faster. As part of the wider food systems, agro-processing, hotels & restaurants displayed commendable growth.



Agriculture proved more resilient than the rest of the economy during the Covid-19 pandemic. In 2020, the agriculture gross value-added increased by 0.9% compared to an overall decline in national GDP of 3.4%.



Source: NISR, National Accounts, 2023

III. Labour productivity

Since 2018, the agriculture sector has experienced stagnant productivity compared to other sectors. This is attributed to factors like limited commercialization and utilization of technology as well as low climate resilience within the sector.

Source: NISR, National Accounts, 2023 & NISR, Labor Force Survey, 2023

Food crop production increased between 2018 and 2023 due to increased harvested area of about 10%,[33] but overall yields did not increase as anticipated under PSTA 4. There were large variations between crops (see infographic 6B). Some crops recorded increased yields and production, including cassava, wheat, paddy rice, sweet potato, and maize amongst others. On the other hand, some important crops saw declining yields, mainly due to crop disease and climate change. For instance, bean yields declined by 18% mainly due to droughts, disease and lower use of quality seeds. Furthermore, cooking banana yields declined by 16% in the period due to widespread Banana Xanthomonas Wilt disease.

Animal resources production volumes increased significantly during PSTA 4 implementation. This growth is attributed to different programs supporting the development of the animal resources sub-sector.[34] The milk production increased from 776,284 MT to 1,061,301 MT (37%) from 2016-2017 to 2022-2023. Meat production rose from 96,457 MT to 197,778 MT (105 %) driven mainly by beef and poultry which constitute 35% and 27% of total meat production respectively.[35] The growth in meat production is driven mainly by beef and poultry which constitute 35% and 27% of total meat production, respectively.[36] Egg production increased from 7,475 MT to 17,344 MT (132%). Fish production is reported to have increased from 31,465 MT in 2018-2019 to 46,495 MT in 2022-2023, whereas honey production rose from 5,200 MT to 7,250 MT.[37]

Cross-cutting challenges in animal resources production are related to cost of feed, animal genetics, and disease management. Goat meat production is hampered by Rift Valley Fever and PPR, pork production by African Swine Flu and Swine Erysipelas. Egg production and poultry are particularly affected by the cost of quality feeds. Projects to improve access to protein sources in animal feeds are ongoing, especially the production of new soya varieties[38] and proteins from insects.[39] Over 80% of fish production is currently capture fisheries, but aquaculture is expected to grow substantially in the coming years.[40]

Agriculture exports increased from USD 462.4 million in 2018/19 to USD 857 million by 2022/2023.[41] Rwanda has a revealed comparative advantage in high-value agriculture products due to its small size and unique growing conditions. The traditional export crops are coffee and tea which still take up over a quarter of total agricultural exports. Additionally, there are substantial informal cross-border exports of animal products, live animals, and cereals to neighbouring countries. Horticulture exports such as fruits, vegetables, flowers, and nuts grew by 136% increasing their export share from 4% to 7%.

These developments indicate that an inflexion point has been reached with several logistics and transport related factors addressed in tandem with improved business linkages to large buyers in high-value markets. This trend is expected to continue, fuelled by the establishment of the Gabiro Business Hub in the Eastern Province and other production sites to meet the demand for consistent and large quantity supply in high-value export markets. Other agriculture commodities (e.g. grains and re-exports) constitute more than half of agriculture exports and grew by 38.5%. Main challenges in the export area are related to climate change, price fluctuations, commodity certification, limited branding and value addition, as well as the quality and quantity of exportable agriculture products.

33 NISR, Seasonal Agriculture Survey 2018-2023

34 MINAGRI, 2024, Livestock Development Strategy

35 RAB statistics

36 RAB statistics

37 MINAGRI, 2022-2023 Annual report

38 RAB et la Fondation Avril: "Plan Soja Rwanda 2030"

39 MINAGRI, 2024, Livestock Development Strategy

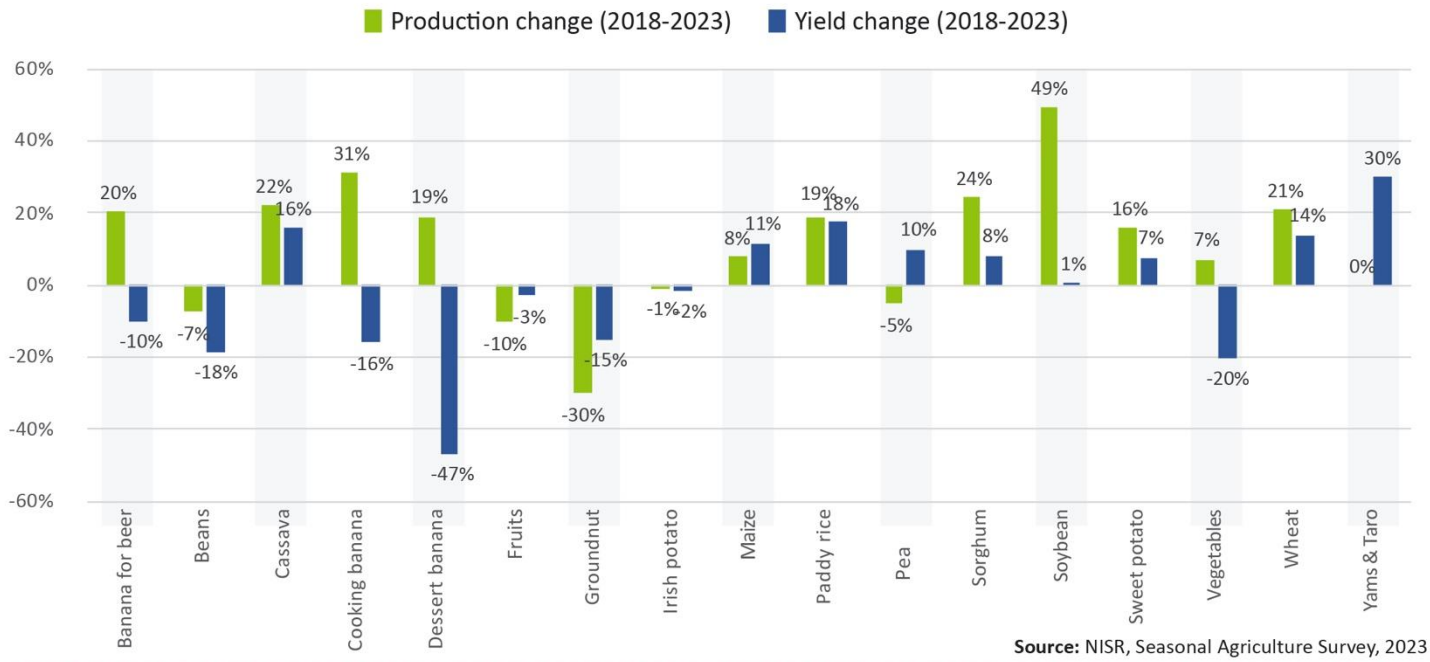
40 MINAGRI 2023, Aquaculture Development Strategy

41 MINAGRI, 2023, annual Report 2022/23

6B. AGRI-FOOD SYSTEMS PERFORMANCE

IV. PRODUCTION AND YIELD CHANGE

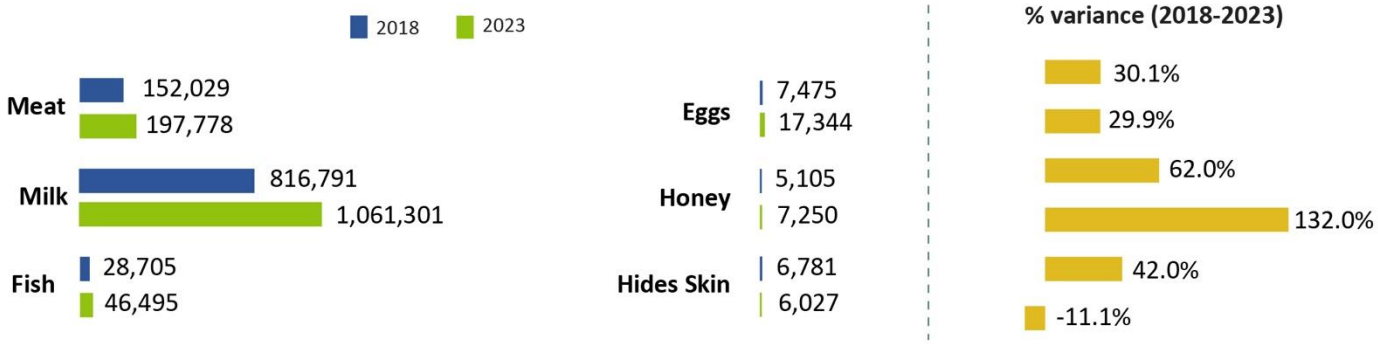
Average food crop production increased by roughly 3% between 2018 and 2023, due to increased harvested area of about 10%. Yields declined on average by 3% although there were large variations between crops.



Source: NISR, Seasonal Agriculture Survey, 2023

V. ANIMAL PRODUCTION (MT)

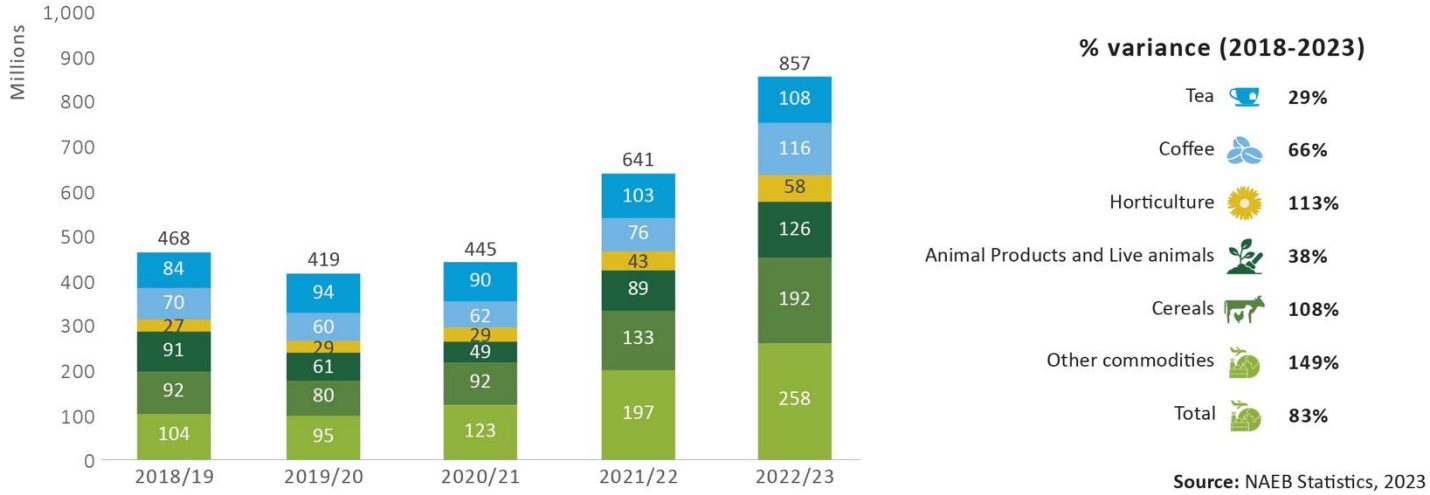
There was substantial growth in animal resources production in the 2018-2023 period especially in eggs. This growth is attributed to different programs such as the livestock intensification program, Girinka program, small stock development, and genetics improvement.



Source: MINAGRI, Annual Report 2022/23

VI. EXPORTS PERFORMANCE

Agriculture exports increased by 38% between 2018 and 2023. Coffee and tea remain the largest export value chains.



Source: NAEB Statistics, 2023

2.2.2 Performance towards Food Security and Nutrition

Over the past few years, the country faced increased exposure to food related risk factors, impacting food availability, access, and market stability. The year-on-year food inflation peaked at 65% in November 2022, due to a combination of reduced global supply of grains and fertilizers, food export restrictions from several countries in the region, and climate change impact affecting domestic production[42]. Prior to that, the Covid-19 pandemic had severely affected household incomes[43].

Rwanda relies on imports for 20% of the dietary energy needs rendering the country vulnerable to international food crises [44] . Food production has increased from 2,176 kcal/person/day in 2018 to estimated 2,233 kcal/capita/day in 2023[45]. In theory, and given the given the age composition of the population, this is sufficient to cover the country's food needs, but food loss, animal feeds, exports, etc. leave the country with a self-sufficiency ratio of 79.4%[46], i.e. a deficit. Main contributors to dietary energy production are staple crops. The most important crops for dietary energy production are maize (16%), beans (15.6%), banana (14.9%), cassava (13.4%), and sweet potato (14.6%). The contribution to dietary energy from animal products has increased slightly from under 10% in 2018 to over 11% in the period. Milk is the most important animal product contributing 5% of dietary energy production.

National protein production increased by 10% between 2018 and 2023, but according to estimates the production is 19% short of the domestic need [47] . Production stood at 68 grams/person/per day, whereas the estimated need is 84 gr/person/day, considering the age-distribution of the population. The contribution of animal protein increased from 24.3% to 30.9% between 2018-2023. Beans remain the predominant contributor to protein production at 30.4%.

42 Xinshen Diao, Paul Dorosh, James Thurlow, David Spielman, Jenny Smart, Gilberthe Benimana, Serge Mugabo, and Gracie Rosenbach, 2022, Impacts of the Ukraine and Global Crises on Poverty and Food Security, IFPRI Country Brief 5

43 NISR, CFSVA 2021

44 According to NISR, Food Balance Sheet 2022 the self-sufficiency ratio is 79.4%

45 NISR, 2023, Rwanda Food Balance Sheets Dashboard

46 NISR, Food Balance Sheet, 2022

47 Authors calculation from: NISR, Seasonal Agriculture Surveys; MINAGRI Annual Report Animal Resources 2022/23;

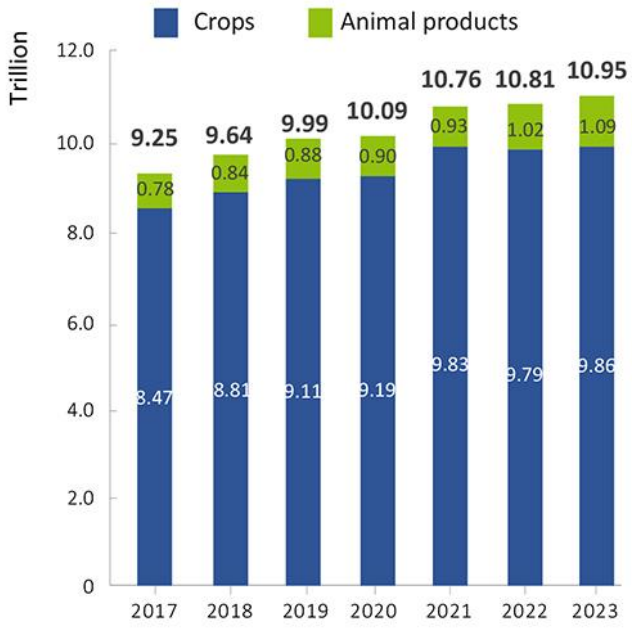
Kcal/kg estimates from FAO and NISR, 2023, 5th Population and Household Census 2022 and age-specific dietary needs. The need is estimated under the assumption that an active person needs 15% of their energy intake from protein sources.

7. DOMESTIC FOOD PRODUCTION VERSUS DIETARY NEEDS

I. KILOCALORIES PRODUCTION

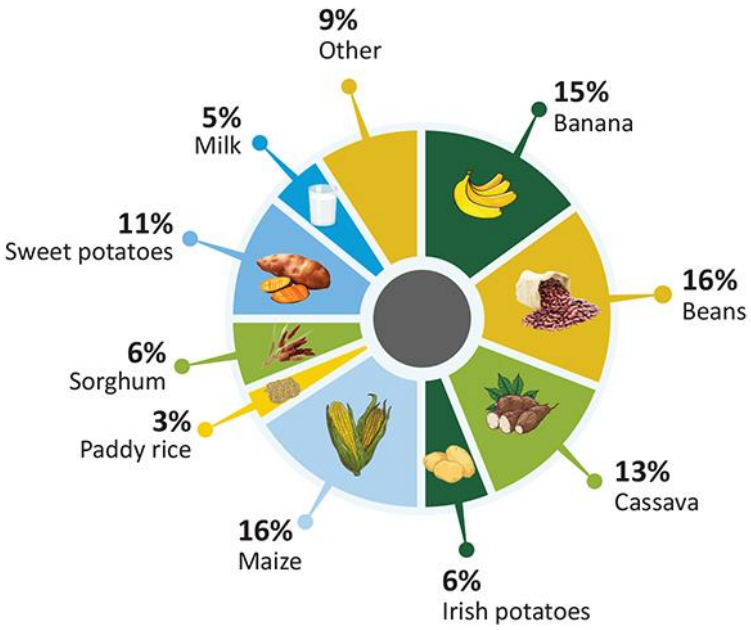
i.a Total kcal production 2018-2023

In 2023, the total kcal production reached 11 trillion, a 14% rise from 2018. This translates to an average of 2,233 kcal per person per day, which meets the population's required kcal intake. Crops, primarily staple crops, contribute over 90% of the production.



i.b Crops and Animal Resources contribution to kcal production 2023

The most important crops for kcal production are maize (16%), Beans (15.6%), Banana (14.9%), Cassava (13.4%), and sweet potato (14.6%), whereas milk is the most important animal product.

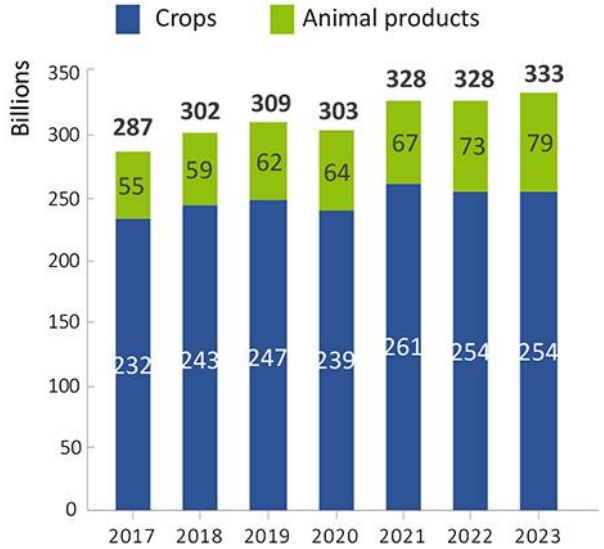


Source: NISR, Rwanda Food Balance Sheets Dashboard, 2023

II. PROTEIN PRODUCTION

ii.a National protein production 2018-2023

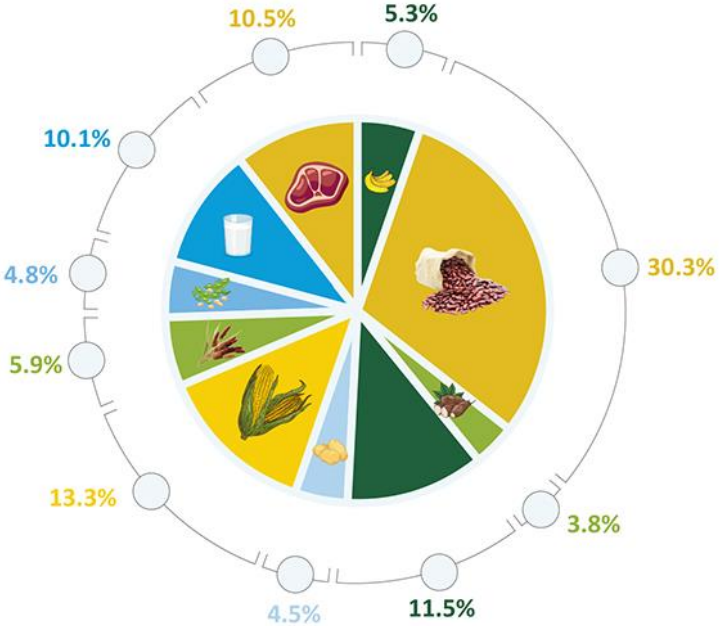
Protein production amounted to 333 billion, marking a 10% increase from 2018. However, estimates indicate that production falls short by 19% compared to domestic demand. Crops account for over 75% of the production.



Source: NISR, Rwanda Food Balance Sheets Dashboard, 2023

ii.b Crops and Animal Resources contribution to protein production 2023

Beans remain the largest contributor to protein production at a rate of 30.3% followed by maize (13.3%), meat (10.5%), and milk (10.1%).

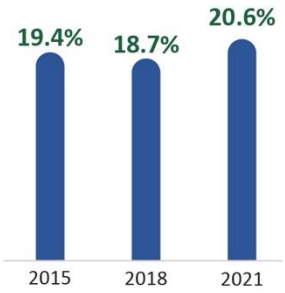


8. STATUS OF FOOD SECURITY IN RWANDA

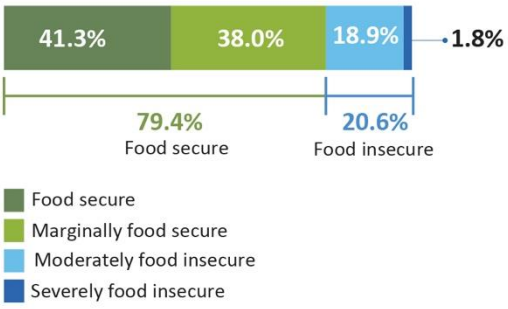
I. FOOD SECURITY STATUS

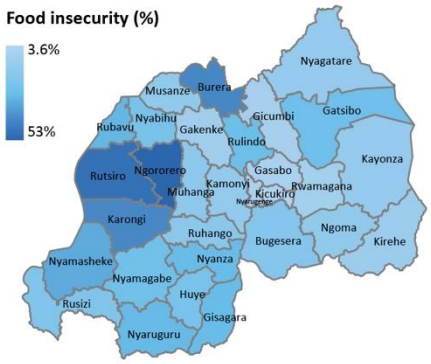
In 2021, food insecurity affected 20.6% of households, with a higher incidence noted in certain districts located in Western and Northern provinces. This rate has risen from 18.7% in 2018 due to the effects of COVID-19, heightened inflation, and other global shocks, which have impacted food affordability.

i.a Trends in food insecurity



i.b Food insecurity as of 2021



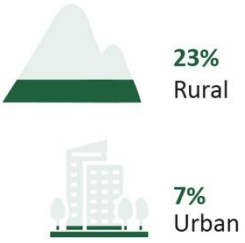


Source: NISR, Comprehensive Food Security Vulnerability Analysis, 2021

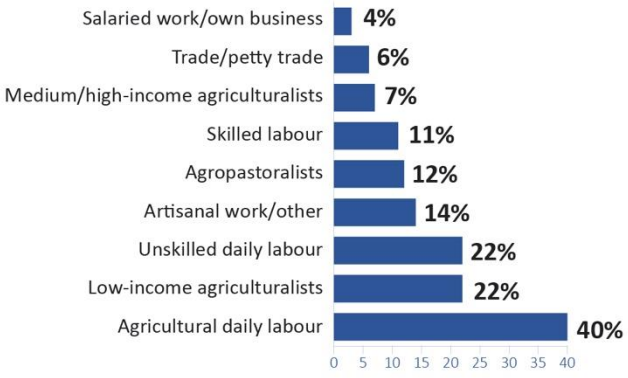
II. FOOD INSECURITY ACROSS HOUSEHOLDS DEMOGRAPHICS

Food insecurity is higher among rural households, those reliant on the agriculture sector and those with smaller land holdings. Additionally, households headed by females, individuals outside the working age bracket (below 18 or above 60 years old), and those led by less educated individuals are more prone to experiencing food insecurity.

ii.a Residence

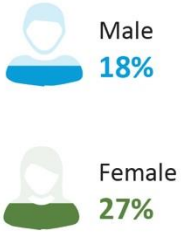


ii.b Economic activities

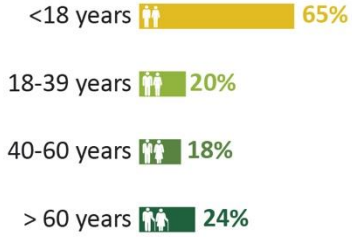


ii.c Land ownership

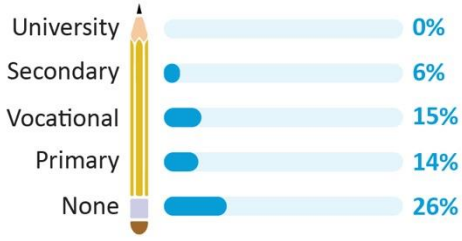
ii.d Sex of household heads



ii.e Age of household heads



ii.f Educational attainments



Source: NISR, Comprehensive Food Security Vulnerability Analysis, 2021

Food insecurity stood at 20.6% of households in 2021, which is similar to 2015 and 2018, and is correlated with household wealth, education, urbanisation, profession, and gender[48]**.** Only 2% of households in the wealthiest quintile, are affected by food insecurity; if the head has completed secondary education, only 7% are food insecure; food insecurity in urban areas is 7% vs 23.3% in rural areas; 40% of agriculture day-workers are food insecure; 27% of women headed households are food insecure vs 18% for male headed households (see infographic 8 below).

Although the rates of stunting persist at elevated levels, the recent advancements indicate that different initiatives are yielding positive results. By 2021, stunting decreased to 32.4% versus 34.9% in 2018 and 43% in 2012[49]. Most impressively, stunting rates in severely food insecure households declined from 62% to 40%[50]. This may be attributed to accelerated Government efforts over the past 5 years with initiatives such as the Shisha Kibondo programme, community-based nutrition programs where monthly growth monitoring and malnutrition screening is conducted, and therapeutic feeding programmes, involving 25% and 11% of children in the 6-23 months age group, respectively. Given the results, there are continued indications for sustained efforts to ensure equitable access to proper nutrition for all children.

However, considerable efforts on several fronts are still required to reduce stunting further. As we delineate the socio-economic factors influencing nutritional outcomes, it becomes evident that stunting rates are considerably higher among the poorest households (43%) underscoring a direct correlation between economic stability and nutritional well-being. In urban areas, stunting is 15.9% versus 34.7% in rural areas[51]. If the mother has no education, 41% percent of kids are stunted, whereas it is 16.1% if the mother completed high school and 6.0% if she completed university[52]. Global evidence from the past several decades suggests that stunting is a result of diverse spectrum of factors such as overall dietary intake, dietary intake from non-staples, water and sanitation, and gender equality[53]. This point towards implementing comprehensive measures from gender-sensitive interventions, fostering community engagement, rural water access, strengthening healthcare services, aligning policies, and maintaining rigorous data monitoring.

The proportion of underweight female children decreased from 10.2% in 2010/2011 to 6.3% in 2019/2020, whereas for male children, it decreased from 12.7% to 9% during the same period[54]**.** The decline in underweight prevalence signifies positive strides in addressing overall malnutrition. However, like stunting, a gender-specific disparity remains, indicating a need for targeted interventions for male children.

48 NISR, 2022, CFSVA 2021

49 NISR, 2022, CFSVA 2021

50 NISR, 2022, CFSVA 2021

51 NISR, 2022, CFSVA 2021

52 NISR,2022, CFSVA 2021

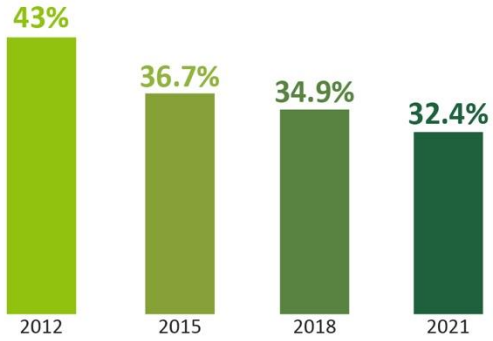
53 Smith, L.C. and Haddad, L. (2015) Reducing Child Undernutrition: Past Drivers and Priorities for the Post-MDG Era. World Development, 68, 180-204.

54 NISR, 2020, Demographic Health Survey

9. NUTRITION STATUS IN CHILDREN

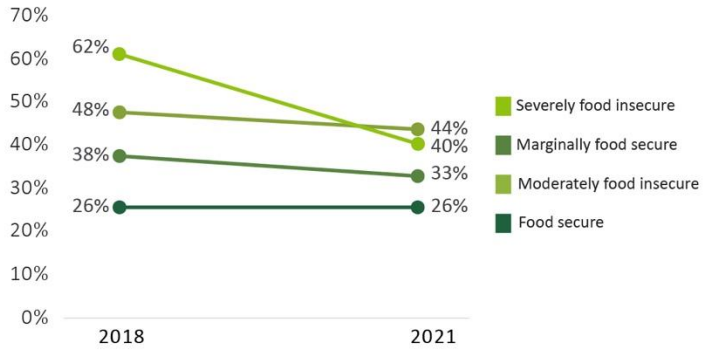
I. TRENDS IN STUNTING RATES

Over the years, there has been tremendous progress in early childhood nutrition. By 2021, stunting decreased to 32.4% versus 34.9% in 2018 and 43% in 2012.



II. STUNTING BY FOOD SECURITY STATUS

The severely food insecure households have seen a significant reduction in stunting moving from 62% to 40%. This can be attributed to initiatives such as the Shisha Kibondo programme and community-based nutrition programs.



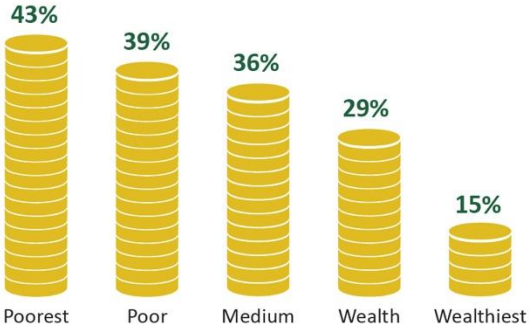
Source: NISR, Comprehensive Food Security Vulnerability Analysis, 2021

III. STUNTING ACROSS KEY DEMOGRAPHICS

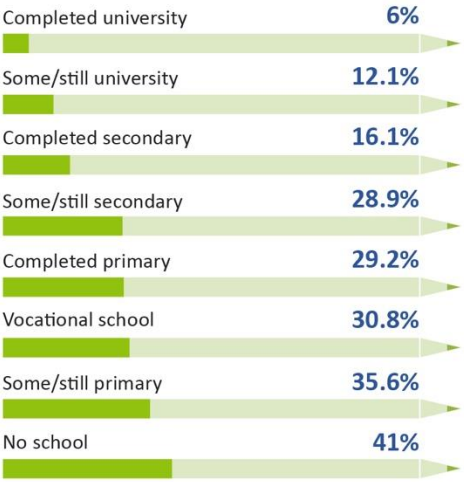
Children residing in rural areas have higher stunting rates. Stunting rates are considerably higher among the poorest households (43%), underscoring a direct correlation between economic stability and nutritional well-being. Moreover, children whose mothers are less educated are more likely to be stunted.

iii.a Residence

iii.b Household's wealth

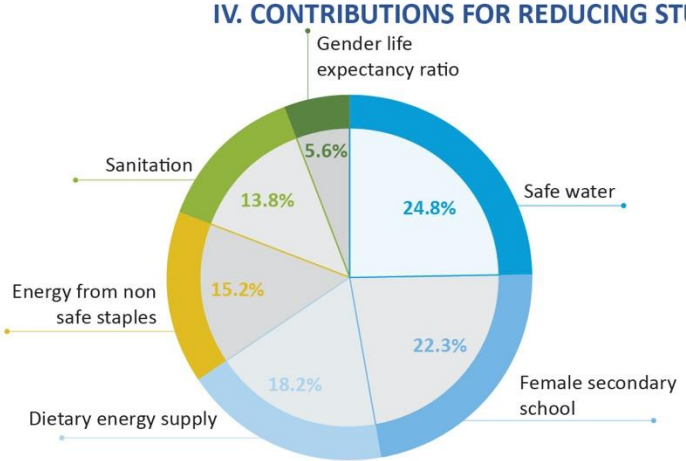


iii.c Mother's education level



Source: NISR, Comprehensive Food Security Vulnerability Analysis, 2021

IV. CONTRIBUTIONS FOR REDUCING STUNTING GLOBALLY 1970-2010



Global evidence suggests that stunting is a result of diverse factors such as water and sanitation, overall dietary intake, dietary intake from non-staples, and gender equality.

Source: Lisa C. Smith, Lawrence Haddad, Reducing Child Undernutrition: Past Drivers and Priorities for the Post-MDG Era, World Development, 2015

Key Challenges and Opportunities

3. Key Challenges and Opportunities

3.1. Production level

Land scarcity: Rwanda grapples with an inherent land scarcity issue, a consequence of its geographical constraints and burgeoning population. Average land holdings are now 0.45 ha, and the median is 0.2 ha. per agricultural household[55]. Increasing productivity and the value generated from the land is of utmost strategic importance and will be more critical in the future as the population grows. Land conservation and restoration will be essential for achieving the productivity objectives. There are essentially 4 ways to increase productivity:

1 **Improving yields and animal productivity in the current production system.** This could roughly double crop production as current yields are at about 40-50% of their yield potential[56]. Animal production can increase manifold with improved practices. This requires intensified investment in improved agronomic practices, irrigation, equipment, inputs, infrastructure, animal feeds and breeds, disease and pest control mechanisms, and research, amongst others. These elements are covered in detail throughout the strategy.

2 **Protecting agricultural land and developing marginal land for improved production.** Integrated landscape management and mainly using climate smart, regenerative and conservation agriculture, which protects land health and maintains land productivity and the agro-ecology. Furthermore, to protect current agricultural land against encroachment from settlements. Finally, developing land which is currently unused for crops and animal production.

3 **Improved food quality, food safety, value addition, and reduced post-harvest losses.** Findings from the latest study 2023 on post-harvest losses, showed that post-harvest losses in the maize value chain is 13.8%, 12.4% for rice, and 11.3% for beans. This represents an important quantity of cereals and pulses lost annually and the need for improving handling capacity. Today the country records a total of 1,512 drying infrastructures including 927 drying shelters, and 585 drying grounds, and a total of 525 storages with respective capacities of 30,961MT: 14,714MT and 297,525MT. The percentage of losses attributed to Aflatoxin is recorded at 2.2% in Maize[57]. Post-harvest management and handling is primarily traditional and lacks advanced technologies and practices, which causes food loss, reduced access to quality inputs for processors and raises food safety concerns. Preventative food related disease is among the leading causes of morbidity in Rwanda, and the third leading cause of child mortality[58].

4 **Prioritising high-value products.** Shifting to high-value products can increase farmer incomes manifold with the current production techniques. For example, if a farmer shifts from beans to cooking banana, the land productivity could increase by almost 10 times using the existing farming practices[59]. Shifting to high-value export crops or animal products can increase the value added by even more[60,61] .

The impact of climate change is significant, and it is expected to accelerate in the future. Mean temperatures have risen between 1.4°C and 2.56°C from 1971 to 2016 and increased

55 NISR, 2020, Agriculture Household Survey

56 PSTA 5 Projection Model

57 Assessment of post-harvest losses for beans, cassava, irish potato, maize, rice, and tomato crops Final Report- 2023 (RAB)

58 Martin Ntawubizi, Anselme Shyaka, Christine Mukantwali, Eugène Niyonzima, Jerome Ndahimana, and Jean Baptiste Ndahetuye,
2020, Situational analysis of the food safety control system in Rwanda: Animal-source foods, fruits, and vegetables, UR/RAB/RSB

59 NISR, 2024, Seasonal Agriculture Survey

60 NAEB, 2024, Profitability Analysis on Horticulture

61 IFPRI, 2024, Crop commercialization in Rwanda: Current market participation and drivers

occurrences of floods and droughts[62](Infographic 10 on page 36). The loss from climate related disasters is estimated between 2%-10% of agri-GDP per year. [63] Meanwhile, the continuous loss from soil erosion has been estimated at RWF 810 billion per year.[64] This trend is projected to continue with mean temperatures to increase by between 0.1-0.3 degrees by 2050 and a 5-10% increase in rainfall variability.[65] The implications are that droughts, floods, landslides, and soil erosion are likely to be more frequent. The future changes may cause yield potentials of essential staple crops to decrease by over 10% by 2050.[66] Rwanda's National Determined Contribution has set goals for climate mitigation and adaptation, especially for conservation agriculture, sustainable intensification, soil and water management, agroforestry, and climate resilient breeds and seeds. The PSTA 5 will incorporate climate smart agriculture as per the NDC.

Low yields and animal production due to sub-optimal agriculture and animal husbandry practices and climate impacts. Whilst the uptake of inputs, irrigation, and land husbandry have improved during the PSTA 4 period, yields remain low. About 65% of farmers had received extension services in 2020[67], but stakeholder consultations have found that the current extension system, has limited uptake, is often of low quality, and is too narrow in its focus[68]. Additionally, there is limited availability of impactful technologies such as climate resilient seeds, post-harvest facilities, and only 1% of farmers report to use mechanization[69] etc. Hence, there is a need to develop demand-driven technologies, and secure uptake and use through a more adapted extension system.

Access to finance and insurance for farm operations. The agriculture sector receives 6%[70] of commercial credit against the target of 10.4%,[71] which is well below its 27% contribution to GDP.[72] Across all consultations,[73] the access and volume of finance was reported insufficient by farmers. Only 17% of farmers receive formal finance for their operations, whereas another 60% get finance from informal lenders or family. Accessing finance is critical for farmers to afford improved technologies and accessing services to improve productivity. Insurance can enhance access to credit through risk mitigation while increasing resilience. The insurance adoption amongst farmers increased from 4% in 2016 to 11% in 2020,[74] indicating that there is a need for increasing coverage.

Commercialization is a key driver for agriculture transformation and food security. About 12% of commercial farmers are food insecure versus 32% for subsistence farmers[75]. Furthermore, uptake of good agriculture practices is substantially higher among commercial farmers compared to subsistence farmers. Previous research has focused on landholdings to drive agriculture transformation[76]. More recent empirical studies find that the level of commercialization and crop choice is relatively more important for household income than landholdings, reinforced by enhanced access to value chain finance and formal credit[77] Furthermore, analysis of Seasonal Agriculture Survey data finds that increasing the share of production sold by 1%-point is associated with 0.19% higher average yield and

62 Ministry of Environment, 2020, Updated Nationally Determined Contribution.

63 Watkiss, Paul, Blanche Butera, Jonathan Bower, 2023, The Macroeconomic Case for Climate Adaptation in Rwanda, IGC.

64 IUCN, 2022, The State of Soil Erosion Control in Rwanda.

65 Ministry of Environment, 2020, Updated Nationally Determined Contribution.

66 Austin, Kemen, R. Beach, D. Lapidus, M. Salem, N. Taylor, M. Knudsen, and N. Ujeneza. (2020). "Impacts of Climate Change on the Potential Productivity of Eleven Staple Crops in Rwanda", Sustainability.

67 NISR, Agriculture Household Survey 2020.

68 Consultation on CAES, 27th July 2023.

69 NISR, Agriculture Household Survey, 2020.

70 BNR, Monetary Statements.

71 Strategic Plan for Agriculture Transformation (2018-2024) Planning for Wealth.

72 NISR, National Accounts.

73 The situation assessment report of PSTA 5 consultations.

74 Agriculture Finance Thematic Report FinScope Rwanda 2020 – Access to Finance Rwanda (afr.rw)

75 NISR, CFSVA.

76 See PSTA 4.

77 IFPRI, 2024, Crop commercialization in Rwanda: Current market participation and drivers, (forthcoming).

1.25% higher income per hectare[78]. The underlying logic is that commercialization generates cash flow and incomes that allow farming households to invest in better practices and household expenditures. Finally, commercialization enhances job creation. Whereas 240,000 commercial farmers are independent, 1.6 million people are workers on commercial farms [79], and bringing production through the commercial challenges create additional jobs in trade, transport, processing and other parts of the Agri-food systems This underscores the need to focus on commercializing farmers to bring about rural transformation.

3.2. Post-harvest and consumer level

Favourable agronomic conditions for high-value products. Rwanda's rainfall pattern allows for 3 harvests annually. It possesses unique climatic and topographical characteristics, making it inherently favourable for the propagation of economically significant crops, notably tea, coffee, and diverse horticulture crops such as chilli, French beans, avocado, passion fruits, and others. The commodities derived from these specific chains are of high quality, consistently commanding a premium price in global markets. Furthermore, several animal resource value chains have seen significant progress over the past decade indicating favourable conditions, especially for products less dependent on feeds such as eggs, milk, aquaculture, and honey. The PSTA 5 will build on these strategic advantages to drive agriculture transformation.

Weak market linkages due to lack of hard and soft market infrastructure. Market linkages require hard infrastructure such as feeder roads, market facilities, post-harvest infrastructure, and cold-chain facilities. According to the World Bank Report, despite the large investments in Rwanda (8.4% of GDP in 2019-2024) there is still a need to increase infrastructure investment to reach the government's goal of 6.5% annual real GDP Growth[80]. However, soft infrastructure is equally important and particular focus will be put on the organisation of all value chain actors for improvement of and ownership in the management of hard infrastructure and the trade relations between actors in the system. Although the country has roughly 5,000 agricultural cooperatives with 1.1 million listed members, only 13% of farmers report being active members of a cooperative or a farmer association[81]. Whilst some farmer organizations are well-functioning, consultations across all provinces have identified a need for improving the governance and management of many farmer organizations to increase farmer participation and strengthen market linkages. Meanwhile, alternative models such as Out-grower Service Companies have emerged and achieved substantial increases and production in their operations, especially in the tea sector.[82] To strengthen market linkages, PSTA 5 will pilot these and other new models for farmer organisations.

Access to safe high-quality food and reducing food loss. Rwanda's domestic food system is predominantly informal, with a large proportion of food being produced for auto-consumption or traded domestically. This informality extends to post-harvest handling, which is primarily traditional and lacking in advanced technologies and practices. Poor handling practices causes food loss, reduced access to quality inputs for processors, and raises food safety concerns. Preventative food related disease is among the leading causes of morbidity in Rwanda, and the third leading cause of child mortality[83]. There is a strong need for hard and soft infrastructure for testing and standards compliance to increase food safety, value addition, and food quality.

High price volatility in consumer markets. Since 2010, food price inflation has seen four peaks in which year-on-year inflation exceeded 20%,[84] i.e. there has been a severe food price shock every 3-4

78 Manayubahwe, Kazana, and Mads Knudsen, 2024, Determinants of Agriculture Yields and Value Added, Technical Note for PSTA 5.

79 NISR, Labour Force Survey 2023.

80 World Bank Document Infrastructure Development: Leveraging Private Sector to close the Gap (worldbank.org).

81 NISR, Agriculture Household Survey, 2020.

82 Gatsby Foundation, 2020, IN IT FOR THE LONG HAUL: Transformative impact from The Wood Foundation Africa and Gatsby Africa's investments in the Rwandan tea sector.

83 Martin Ntawubizi, Anselme Shyaka, Christine Mukantwali, Eugène Niyonzima, Jerome Ndahimana, and Jean Baptiste Ndahetuye, 2020, Situational analysis of the food safety control system in Rwanda: Animal-source foods, fruits, and vegetables, UR/RAB/RSB

84 NISR, Consumer Price Index

years on average. During this period, inflation peaks are typically correlated with adverse weather events,[85] which are anticipated to intensify with climate change. Disaster risk is the sum of vulnerability with the hazard and exposure and that disaster risk management. With the increasing exposure to hazards, it is imperative to strengthen resilience both at the national and local levels by increasing food production and food storage for the growing population as well as increasing resilience at the household level. This requires a cross-sectoral effort contribution from Agri-food systems actors to reduce risk and increase absorptive and adaptive capacities across the system.

Addressing malnutrition. The critical role of dietary diversity and nutritious foods dietary intake from non-staples is equally important for reducing stunting as the overall dietary energy intake.[86] However, the dietary diversity scores have stabilized around 5.5 different food items per week on average as evidenced in the past few CFSVA surveys.[87] Protein intake and several micro-nutrients are generally missing from the reported dietary diversity scores. The factors for low uptake are both economic, behavioural, and systemic. Hence, there is a need to promote public programmes to increase access to nutritious food. This can be achieved through processing of wholegrain, fortification, and bio-fortification. Behavioural change and sensitization on intake of widely available nutritious foods such as orange fleshed sweet potatoes, high-iron beans, small dried fish (rich in vitamin B12), dark green leafy vegetables (abundant in vitamin A) as well as carrots, mango, and milk.[88] Additionally, to increase availability and access through increased production of nutritious food, and increasing income to be able to purchase a variety of foods.

Systemic level

Transformational potential in leveraging youth. Youth farmers have more formal education than the older generations and empirical studies find that they are more commercially oriented, have higher land productivity, and have more off-farm jobs – especially when compared to households with mature heads[89]. However, they only have access to about half the land of non-youth[90]. This points to opportunities in expanding markets for land-leasing in order to potentially increase land productivity. Furthermore, youth have significant potential for entrepreneurship, especially in the wider Agri-food systems and are typically early and efficient adapters of new technology.

Transformational potential in women increasing women participation in commercial value chains and off-farm employment. About 58% of farmers are women, but they are less likely to be involved in market-oriented agriculture and have fewer off-farm jobs than men[91]. About 51% of rural working age women (1.5 million) are outside the labour force compared to 36% of rural men[92]. About 21% of rural women have off-farm jobs. Consequently, there is significant untapped potential from increasing women's labour market participation both from a national perspective as well as for the households.

Transformational potential adopting innovation and digitalization. Several global studies carried out in different countries at various stages of development have found that the average return to investment in agriculture innovation is approximately 40-60%[93] . In Rwanda, crop animal yields are far from the global averages. Hence, there is still a significant potential for research in all stages of the value chain. Furthermore, the past decade has seen the emergence of several digital technologies such as remote sensing, digital payment systems, digital extension services and many others. In Rwanda, 85%

85 World Bank, Note to Development Partners for NST2

86 Smith, L, and L Haddad, 2015, Reducing Child Undernutrition: Past Drivers and Priorities for the Post-MDG Era, World Development 68 (441).

87 NISR, CFSVA 2021

88 Global Alliance for Improved Nutrition (GAIN) and United Nations Children's Fund (UNICEF). Affordability of nutritious foods for complementary feeding in Rwanda. Geneva: GAIN, 2021

89 IFPRI, 2024, Rwandan farmer typologies, (forthcoming)

90 Agriculture Household Survey, 2020

91 NISR, Labour Force Survey 2023

92 NISR, Labour Force Survey 2023

93 MINAGRI, PSTA 4

of farmers have access to mobile phones and currently 55% use mobile payments. These are opportunities to leverage both for the public and private sectors.

Potential for increased private sector and civil society participation. The PSTA 4 mid-term review found limited evidence for synergies with private sector and civil society actors as well as limitations in coordination between different institutions. The food system entails a multitude of sectors and actors, and successful outcomes are contingent on leveraging capacities of all actors. It is therefore crucial to address this gap in the PSTA 5 strategic period, both in terms of research and planning partnerships as well as public-private partnerships.

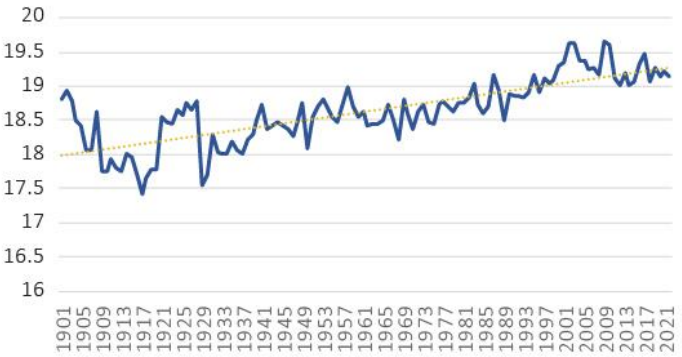
Transformation in building capacities. The PSTA 4 mid-term review found that capacity building and institutional changes envisaged were not sufficiently implemented. This will need to be addressed during PSTA 5 to deliver on the targets. Using an Agri-food systems approach and increased delivery through partnerships there will be an increased need for coordination, knowledge management through the implementation of flagship programs like the Customised Agriculture Extension System (CAES), skills and capacity development, and resource mobilization.

10. CLIMATE CHANGE AND ITS IMPACT

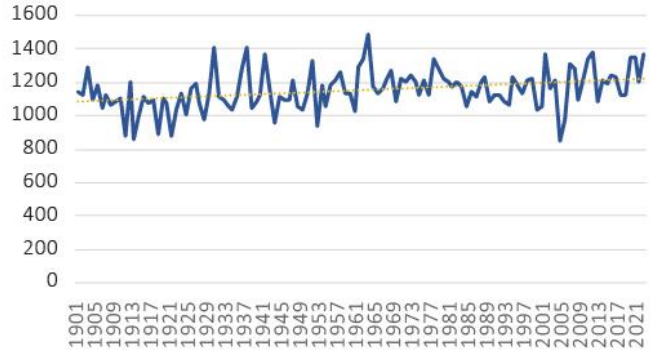
I. TEMPERATURE AND RAINFALL TRENDS

Since 1970, Rwanda experienced a temperature increase of 1.4°C, higher than the global average, and can expect an increase in temperature of up to 2.0°C by the 2030s from 1970. This disrupts weather patterns and results in more severe and frequent storms.

i.a Annual mean temperature (°C)



ii.b Annual mean rainfall (mm)



Source: The World Bank, Climate Change Knowledge Portal, 2022

II. EFFECTS OF CLIMATE-RELATED EVENTS ON AGRICULTURE

Between 2018-2023, Kirehe experienced the most substantial damage in crops due to climate-related events such as floods, landslides, and rainstorms. Rulindo ranks first in terms of livestock damage.

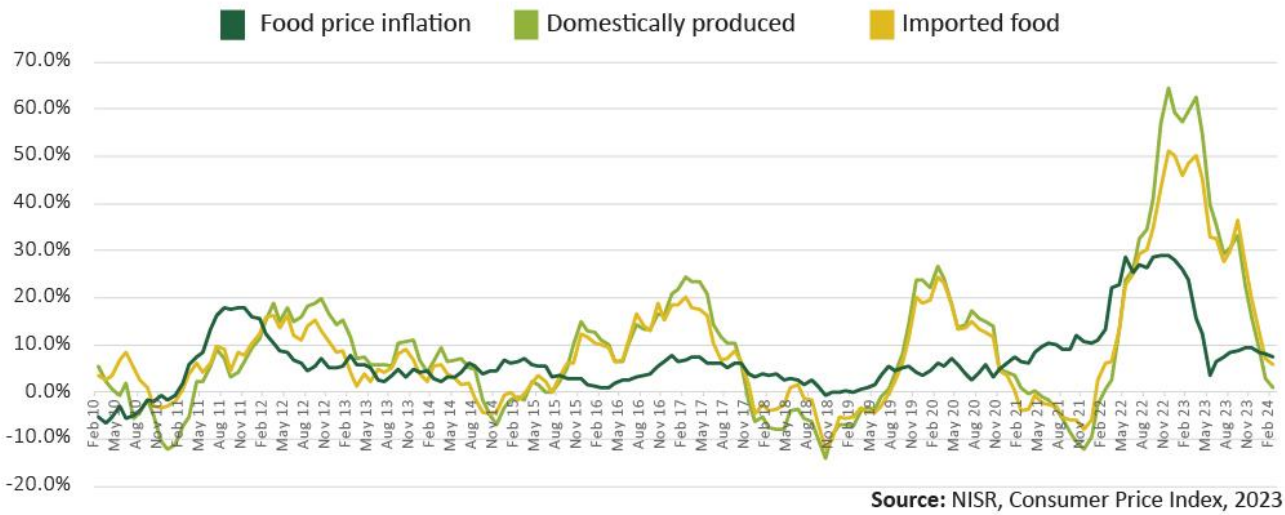
ii.a Average damaged hectares of crops (2018-2023)

ii.b Average Number of Damaged Livestock (2018-2023)

Source: MINEMA, Annual Disaster Effects Reports, 2023

III. IMPACT OF CLIMATE, COVID, AND CONFLICT ON FOOD PRICES

Over the past few years, domestic food prices have spiked due to a blend of factors such as climate change, the covid-19 pandemic, and the global crisis arising from the Russia-Ukraine conflict, with the peak food inflation reaching 65% in November 2022. These price spikes significantly impact the availability, accessibility, and stability of food.



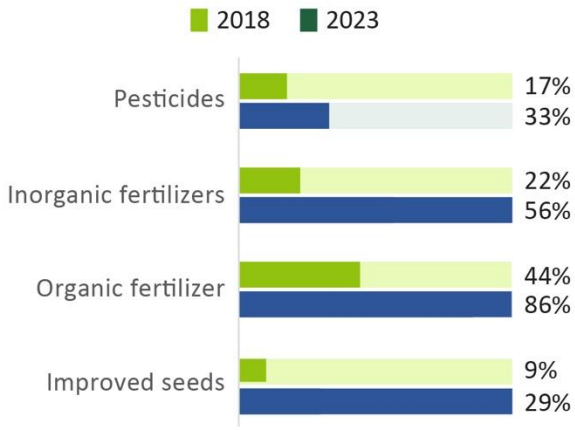
Source: NISR, Consumer Price Index, 2023

11. EXTENSION SERVICES AND AGRICULTURE PRACTICES

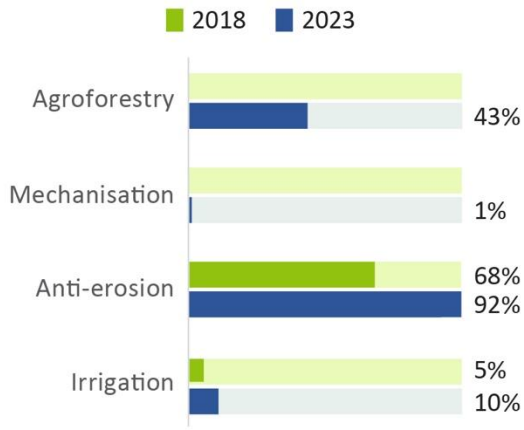
I. AGRICULTURAL INPUTS AND PRACTICES

Between 2018-2023, there was a substantial improvement in accessing agricultural inputs. Using improved seeds and pesticides is still very low compared to other inputs. Few farmers utilize irrigation and mechanization techniques.

i.a % of farmers using agricultural inputs



ii.b % of farmers applying agricultural practices



Source: NISR, Seasonal Agriculture Survey, 2018 & 2023

i.c Irrigation developed (Ha)

i.d Radical terraces (Ha)

i.e Fertilizer applied (Kg/Ha/Annum)

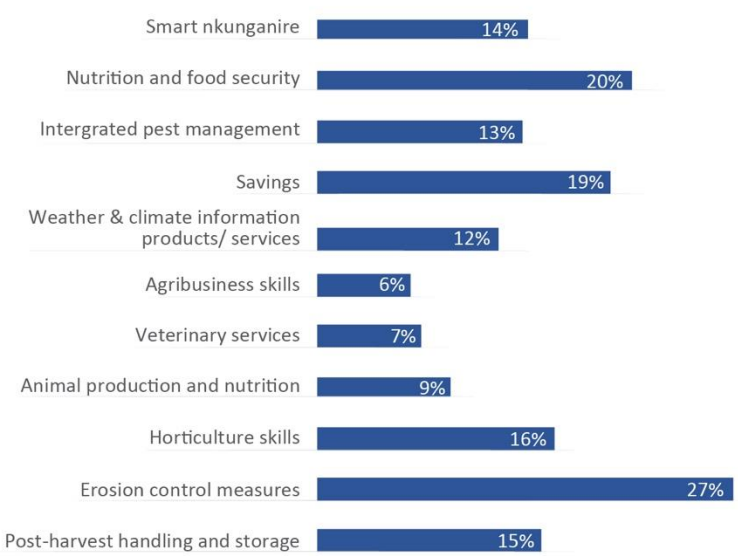
Source: MINAGRI Annual Report 2022/23

II. ACCESS TO EXTENSION SERVICES

Two thirds of agricultural households accessed extension services in 2020. About 13% of agricultural households were part of a cooperative, 21% participated in Twigire Muhinzi, and 12% in farmer field schools.

Agricutural households received extension services

ii.a Type of extension services received

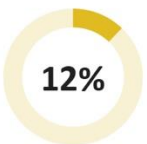


ii.b Farmer groups

Agricultural cooperatives/Association

Twigire muhinzi/mworozi group

Farmer field school

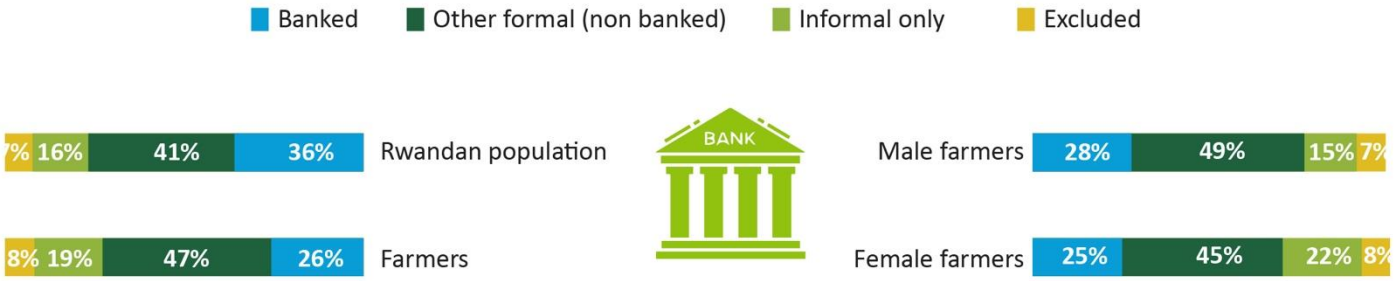


Source: NISR, Agriculture Household Survey, 2020

12. AGRICULTURE FINANCING

Farmers are significantly less banked compared to the Rwandan population, with a higher propensity for using other formal and informal products. Female farmers tend to rely more on informal financial products in contrast to their male counterparts.

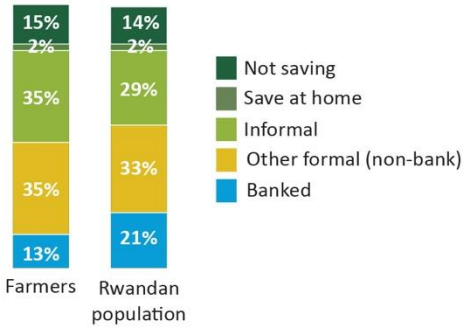
i. Farmers' financial inclusioin



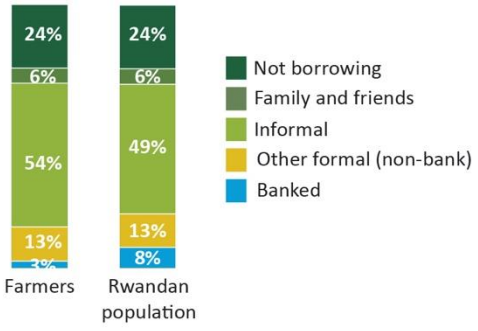
Source: AFR, Agriculture Finance Thematic Report, 2021

Most farmers have access to loans and savings but mainly through informal means. Only 6% of total credit in Rwanda is flowing to the agriculture sector. Which highlights the need of financial interventions tailored to the sector's challenges

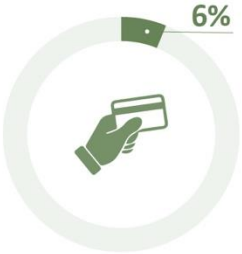
ii. Saving means for farmers



iii. Farmers' access to credit



iv. Credit to the agriculture sector



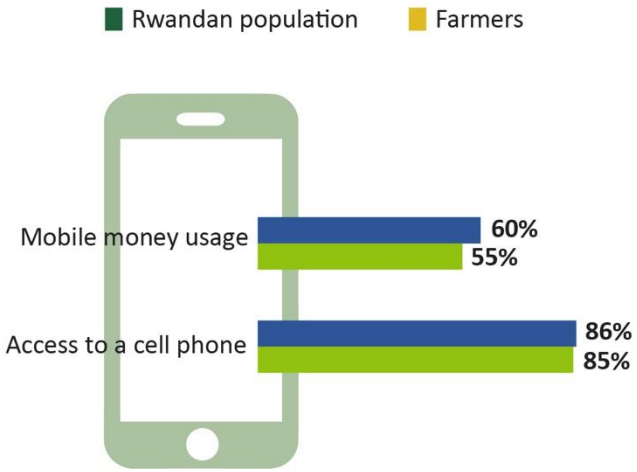
Source: AFR, Agriculture Finance Thematic Report, 2021

Source: MINAGRI Annual Report 2022/23

A smaller proportion of farmers have access to agriculture insurance. The use of mobile money among farmers does not vary from that of the wider national population.

iv. Uptake of agriculture insurance

v. Mobile money usage



Source: NISR, Agriculture Household Survey, 2020

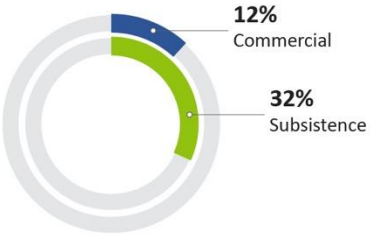
Source: AFR, Agriculture Finance Thematic Report, 2021

13. COMMERCIALIZATION

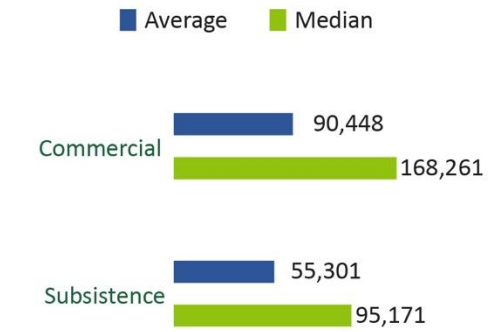
I. COMMMERCIAL VS SUBSISTENCE HOUSEHOLDS

Commercial households are significantly less food insecure, are more affluent, and have higher access to agricultural inputs and practices in comparison to subsistence farmers. In addition, households with more landholdings tend to be commercial.

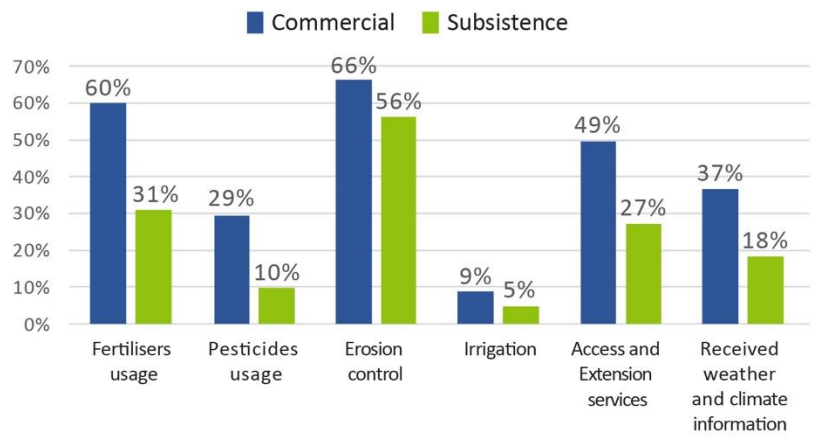
i.a Food insecurity



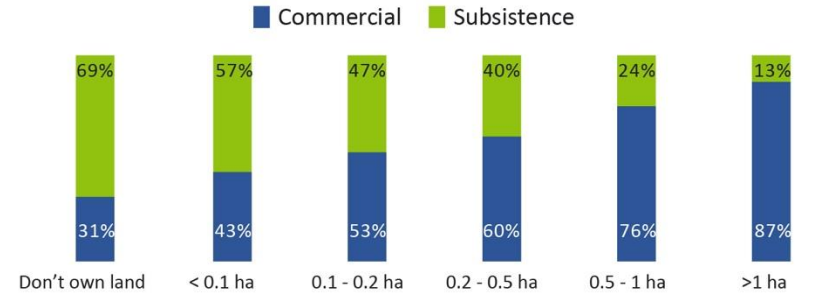
i.b Annual expenditure per capita



i.c Agriculture practices



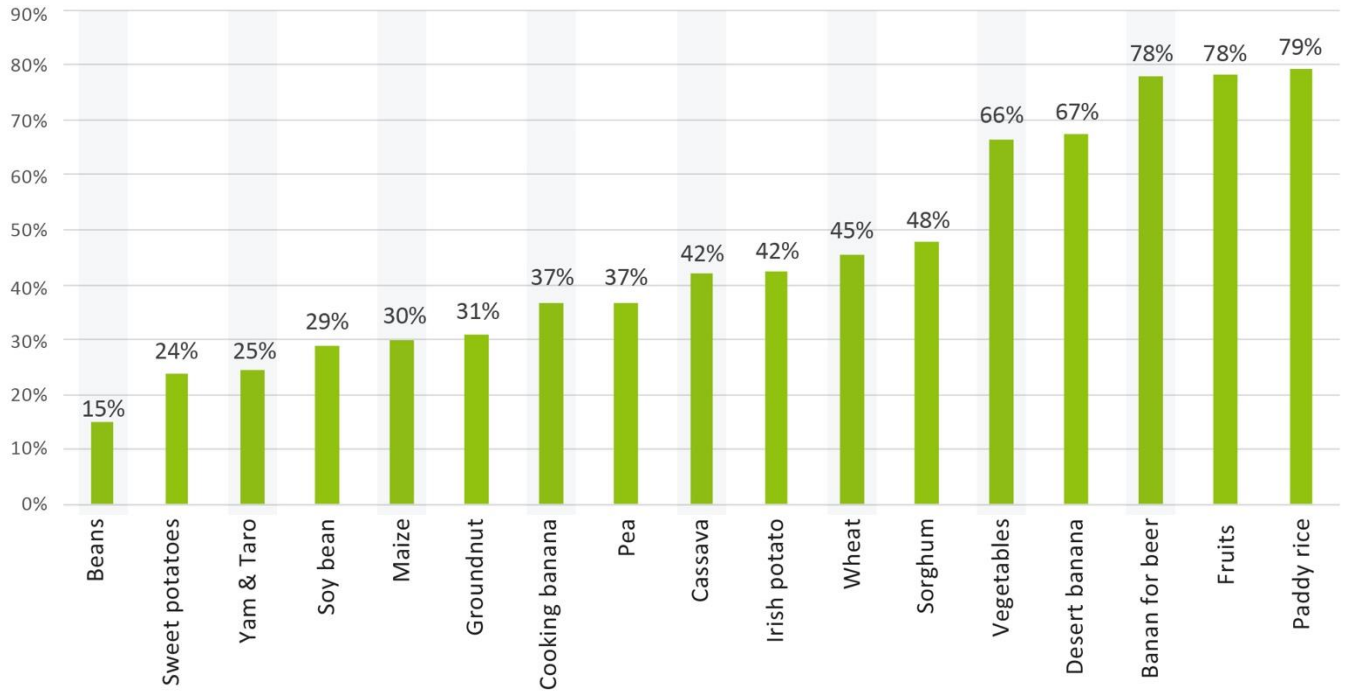
i.d Land ownership



Source: NISR, Comprehensive Food Security Vulnerability Analysis, 2022

II. SHARE OF CROPS SOLD

On average 32% -38% of food crop produce is sold to a market. There are significant disparities between crops, with quite low rates of commercialization for beans, maize, cooking bananas, and cassava. In contrast, commercialization is high in paddy rice, fruits, and beer bananas, and moderately high for dessert banana and vegetables.



Source: NISR, Seasonal Agriculture Survey, 2022

Priority and Theory of Change

4. Priorities and the Theory of Change

4.1. Vision, Mission, and Objective

PSTA 5 serves as a framework for implementing the National Strategy for Transformation (NST 2), ensuring direct alignment with the National Agriculture Policy and Rwanda's Vision 2025. The strategy is guided by the following vision and mission:

VISION	MISSION
A nation that achieves food security, nutritional health, and sustainable agricultural growth driven by a productive, resilient, and market-led agricultural sector.	To ensure food and nutrition security in Rwanda by leveraging modern production and agribusiness, while professionalizing farmers to enhance production, post-harvest management, commercialisation, and competitiveness.

4.2. Impact goals

The impact goals are by the Vision 2050 and NST 2 calling for a bold agenda for PSTA 5 aimed at transforming not only the agriculture sector but underpinning transformation of all Agri-food systems to achieve sustainable food and nutrition security and increasing resilience.

Increased economic growth and opportunities. Increasing rural household incomes will be the bedrock of broad-based transformation in the long-term underpinning progress on social and economic indicators. Vision 2050 sets a bold target for labour productivity which is a function of growth in agriculture GDP and creating non-farm opportunities to reduce the dependency of agriculture for incomes. This requires a substantial increase in land productivity paired with labour saving technologies. Moreover, it requires a shift to higher value products through increased exports and value addition. Increasing incomes for agricultural households will underpin the economic transformation in the decades to come.

Improved food security and nutrition. Agriculture is the cornerstone of both economic stability and societal health and well-being. PSTA 5 targets a substantial elevation in the percentage of our populace who are food secure. Concurrently, in a bid to nurture a healthier future generation, the plan is committed to reducing stunting rates. National food sovereignty is another aspect of food security to be addressed by the strategy. The strategy will target increased national production and food reserve capacity.

Improved resilience. Over the past few years, the world has seen global shocks such as the COVID-19 and supply shocks to essential agricultural resources, coupled with the relentless challenges of climate change. Like other countries, Rwanda was severely impacted by these shocks, and it is very likely that there will be more shocks in the future. It is therefore paramount to build resilient Agri-food systems against both social, economic, and natural shocks. Measures of using climate-smart agriculture techniques, de-risking the agriculture sector, ensuring inclusiveness in all agriculture-related activities, capacity building of farmers as well as the enhancement of the current strategic grain reserve will be taken.

Table 1: Impact Indicators

Indicator	Unit	Source	Baseline (2023)	2028/29
Inclusive economic transformation				
Agriculture GDP growth	%	GDP National Account	2.0%	6.1%
Agriculture exports revenue (USD Million)	USD Million	NAEB Annual Report	875	1,540
Off-farm jobs in the Agri-food	Number off-farm jobs in Agri-food system	Labour force Survey and SAM	400,000	644,204
Women's Empowerment in Agriculture Index	Index value	IFPRI	72%	100%
Improved food and nutrition security				
Percentage food secure HH (CARI indicator)	%	CFSVA	79.4% (2021)	88%
Stunting rate	%	CFSVA	32.4% (2021)	15%
Dietary diversity score	Score	CFSVA	5.5	8.0
Food self-sufficiency ratio	%	Food Balance Sheet	79.6% (2022)	100%

4.3. Cross-cutting priority areas

The strategy has several cross-cutting priorities. These are priorities which due to their importance and complex nature need to be considered across all strategic components both in planning and implementation. In PSTA 5 the following are considered as cross-cutting areas:

1. **Farmer inclusion.** Farmers are key stakeholders in the Agri-food systems and their participation is crucial for successful implementation of the strategy. It is critical to involve farmers in the decision-making process and ensure that interventions are closely aligned with their needs, experiences, and insights. This will happen for example through introducing Village Land Use Action Plans. Also, inclusion of categories of farmers in the Agri-food systems by linking them to markets and services

is also a cross-cutting priority, as this will underpin the transformation of the sector and the economy in the decades to come.

2. **Environment and climate change.** The accelerating impact of climate change is affecting the entire food system. Climate adaptation is therefore to be considered across all strategic interventions. Conservation agriculture is one of the key levers in adaptation, and as such, its principles have been tested and currently being expanded across various initiatives and will loom prominently in the upcoming strategic period. In 2022, the adoption of Conservation Agriculture in Rwanda commenced, leading to the establishment of 5,416 demonstration plots by 2023[94]. It is projected that full-scale adoption at the village level is anticipated[95].

3. **Improved nutrition.** Nutrition is critical for building human capital and it is therefore important for the long-term potential of the economy. Yet, the stunting rate remains high at 32.4%. Addressing this will require a multi-sector approach and concerted efforts across accessibility, availability, and uptake of healthy diets, as well as partnership between institutions championing this cause. Nutrition is a crosscutting priority in PSTA 5, but there are also nutrition targeted interventions in Priority Area II.

4. **Youth employment.** Youth is a valuable resource, carrying potential for innovation and dynamism. Harnessing this potential requires intentional effort toward creating off-farm opportunities and capacity building in the Agri-food systems. By diversifying opportunities within the sector, youth can find employment in various fields that match their skills, energy, and interests. The creation of meaningful job opportunities, aligned with the youth's interests and aptitudes, is crucial. Such roles must not only be engaging but also provide equitable financial rewards, enabling young individuals to secure a respectable standard of living. This will ensure their integration into the workforce with dignity and purpose.

5. **Gender and family promotion.** The text discusses the importance of gender equity in agriculture, emphasizing that women face disparities in income and farming opportunities when compared to men. To address this, the strategy prioritizes gender inclusion, ensuring women have equal access to agricultural resources and decision-making processes. The approach aims to empower women, enhancing productivity and household agricultural output. Updating the Gender and Youth Mainstreaming Strategy aligns with this vision, focusing on adopting labour-saving technologies to improve efficiency and the quality of agricultural products. This transformational framework serves as a catalyst for engaging diverse stakeholders and driving social and economic change in agriculture.

6. **Leveraging the private sector.** Recognizing the critical role of the private sector in driving innovation and investment, this priority seeks to foster a conducive environment for private sector participation and collaboration in the agricultural sector.

7. **Digitization of the Agri-food systems.** Digitization will fuel the transformation both on farms and in the wider Agri-food systems. Digital solutions have transformational potential for improving production, quality, traceability, finance, planning and several other aspects.

8. **Capacity development.** The complexity of the Agri-food systems requires strong actors. Interventions across the strategy will target capacity building of farmers, value chain actors, and systemic enablers (policymakers, public servants) during implementation to achieve sustainable results.

9. **Adaptive management in implementation.** This priority underscores the importance of flexibility and responsiveness in management practices, allowing for continuous learning, adjustment, and improvement of strategies based on evolving circumstances and insights.

10. **Disaster Management.** Despite the emphasis of PSTA 5 on building resilient and sustainable food systems, disasters may still occur that cannot be prevented. Agriculture remains a sector particularly exposed and vulnerable to natural hazards and disasters. Risk mitigation and disaster management are integral components of the interventions proposed under PSTA 5. Promoting good agricultural practices continues to be a priority to reduce risks at the farm level. During PSTA 5, agricultural research should consider risk reduction, adaptation, and sustainability, while agricultural insurance products help farmers and stakeholders recover after a crisis. Additionally, capacities and

94 Speech by MINAGRI Minister of State, Knowledge Seminar, November 22, 2023

95 RAB internal source.

institutional systems will be strengthened to improve disaster preparedness by providing timely information and having response and recovery plans and systems in place.

11. **Disability and social inclusion.** Under PSTA 5, the theme of disability and social inclusion is critical to ensuring that all members of society benefit equitably from advancements in agriculture. PSTA 5 emphasizes the integration of persons with disabilities into all aspects of agricultural development, ensuring that they have equal access to resources, training, and opportunities. Inclusive policies and programs will be designed to remove barriers and create enabling environments for disabled individuals to participate fully in the agricultural value chain. Through targeted interventions, capacity building, and awareness campaigns, PSTA 5 aims to foster a culture of inclusivity, empowering individuals with disabilities to contribute to and benefit from resilient and sustainable food systems.

12. **Data and Statistics.** Under PSTA 5, data and statistics are very important in building resilient and sustainable food systems. Accurate, timely, and comprehensive data collection and analysis are essential for informed decision-making and strategic planning. PSTA 5 emphasizes the enhancement of data management systems to ensure the reliability and accessibility of agricultural data. This includes leveraging advanced technologies and methodologies for data collection, processing, and dissemination. By strengthening the capacity for data-driven analysis, PSTA 5 aims to improve monitoring and evaluation processes, identify trends and challenges, and support evidence-based policy formulation. The goal is to create a robust data ecosystem that supports continuous improvement and innovation in the agricultural sector.

13. **HIV /AIDS and NCDs.** Under PSTA 5, addressing HIV/AIDS and non-communicable diseases (NCDs) is essential for building resilient and sustainable food systems. Recognizing the impact of health on agricultural productivity, PSTA 5 integrates health considerations into its strategies and interventions. Efforts focus on raising awareness, providing education, and ensuring access to healthcare services for individuals affected by HIV/AIDS and NCDs within the agricultural community. By promoting healthy lifestyles and supporting disease prevention and management, PSTA 5 aims to enhance the well-being and productivity of farmers and agricultural workers. This holistic approach not only improves individual health outcomes but also strengthens the overall resilience and sustainability of the agriculture sector.

14. **Research and Development.** Under PSTA 5, research and development (R&D) are cornerstone activities for advancing resilient and sustainable food systems. Emphasizing innovation, PSTA 5 supports comprehensive R&D initiatives aimed at improving agricultural productivity, sustainability, and climate resilience. This involves fostering partnerships between research institutions, universities, and the private sector to drive technological advancements and the adoption of best practices. Key areas of focus include developing climate-smart agricultural technologies, enhancing crop and livestock varieties, and promoting sustainable land and water management practices. By investing in R&D, PSTA 5 seeks to generate new knowledge, solutions, and tools that empower farmers, enhance food security, and contribute to the long-term sustainability of the agricultural sector.

15. **Regional and International positioning.** PSTA 5's focus on "Regional and International Positioning" is crucial for enhancing Rwanda's competitiveness in the global agricultural market. This theme is justified by the need to integrate Rwandan agriculture with regional and international markets, ensuring local farmers and agribusinesses can access broader markets, benefit from trade agreements, and attract foreign investment. Key activities to implement include establishing strategic trade partnerships, participating in international agricultural fairs and exhibitions, enhancing export quality standards, and facilitating knowledge exchange through global collaborations and training programs. These efforts will help position Rwanda as a leading agricultural hub in the region, fostering economic growth and sustainability.

4.4. Theory of change

The Theory of Change identifies the pathways between the strategic priorities and the expected results, by addressing root causes of systemic barriers for actors in the Agri-food system.

The core problem for most actors in the system is financial capital.

Subsistence/semi-commercial farmers generally have insufficient resources to invest in improving the production, mitigating risks, and meeting basic needs of the household. As a result, there is a low uptake of technologies, which in turn causes yield gaps in the animal and crop production, lower incomes with direct effect on food and nutrition security. This has a consequence on the other actors of Agri-food systems as the off-takers do not get sufficient quality produce from farmers while the input and service providers struggle to sell their products and services to the producers. Furthermore, consumers in general are either having limited access to sufficient and quality food or having insufficient incomes (considering that about 68% of the consumers are farmers) to fulfil their food needs in terms of quality and quantity.

The key strategic entry point for unlocking the system is to connect farmers to remunerative markets, which increases farm incomes and fuels the system. When farmers are connected to attractive markets that are profitable or remunerative, incomes from farming increase, and so does the ability and incentives to invest in inputs and technologies which further increase production and reduce risks to the production (including climate risks). Due to this investment, there will be more jobs for farm workers, more business for inputs and service providers, and more produce for off-takers. Consequently, production, jobs, and incomes increase across the Agri-food systems. Food availability, access, and stability will contribute to the benefit of consumers, which will lead to the substantial use of nutritious food, and improvements in food security and nutrition outcomes.

The boosted farm incomes to fuel the system will be the basis for increasing uptake of enabling functions, which will propel the system further forward. Market-oriented farmers will be able to invest in technologies and extension services, stimulating the production of modern technologies and services which will be provided by the public sector, research institutions as well as the private sector institutions. Enhancing the quality of these institutions will have a multiplicative impact on the Agri-food systems. This will also be coupled with digitalization, to ensure a smooth and more efficient running of the system. With increased cash-flows, cash-flow based lending will be possible, creating finance to fuel the system further. Moreover, farmers will be able to afford agri-insurance to increase resilience against disasters. Finally, with increased commercialization and incomes, system actors will be able to afford the use and maintenance of infrastructure at the level of production, post-harvest, and further stimulate the development of agricultural value chains.

Youth will play a key role in this transformation. With improved enabling factors, youth will play key functions in the Agri-food systems as commercial farmers, skilled farmworkers, and entrepreneurs across the entire system, leading to the creation of more decent jobs.

The potential of women's increased participation in the value chains will be unlocked. With the transitioning system, opportunities to increase women's labour market participation will increase. However, the barriers are specific to each context, so all interventions will need to consider the barriers and circumstances preventing their equal participation.

Vulnerabilities to various shocks must be addressed in the short and medium term. The full transition is not expected within this strategic period. There will be a continued need to support resilience of vulnerable households – smallholders in particular. Critical consideration will be given to climate change adaptation and shocks mitigation to ensure food availability at households and national level in the foreseeable future. This Theory of Change informs the Priority Areas to be discussed in detail in the following sections, and especially how they are interlinked. These are the Modernization of Agriculture and Animal Resources Production for resilient Agri-food systems (the production side); Inclusive markets and post-harvest management for sustainable Agri-food systems (the supply and post-harvest handling side) and strengthening the systemic enablers. Financial and technical investments in the

three priority areas while considering the cross-cutting areas will ignite the transformation of Agri-food systems in Rwanda toward the desired impact.

4.5. Key innovations

The PSTA 5 brings on board the following key innovations:

Increased focus on Agri-food systems thinking. PSTA 5 takes a holistic approach realizing the role of agriculture as a generator of both incomes and food for the population. It considers the actors of the system and the relationships between them to engender improved outcomes. Furthermore, it considers the full spectrum of sectors in the system including health, environment, trade, infrastructure, digital economy, the financial sector etc. and the interaction and linkages between the sectors. This approach calls for increased emphasis from MINAGRI on its role as a coordinator, regulator, and facilitator of the Agri-food systems, coordinating the efforts of other public and civil society actors and leveraging the private sector. This requires an increased focus on managing knowledge and planning jointly with other actors.

Increased focus on climate resilience. Recognizing climate change as a tremendous force with severe impact on incomes and food security, the PSTA 5 will prioritize climate resilience. This includes climate smart agriculture practices, including sustainable land management, soil health, water management as well as climate resilient seeds and breeds. Regenerative agriculture techniques will be embedded in the extension system, and the focus of research will be to develop and implement climate resilient technologies and practices.

New management of agricultural land through agriHubs and Food Basket Sites s. To achieve the desired agricultural productivity and growth, an innovative approach to land management will be implemented. Agricultural land with potential for consolidation will be identified and mapped to facilitate focused interventions from both the public and private sectors. This initiative aims to enhance production for food security and commercial purposes. Infrastructure investments, such as irrigation systems, cold chain facilities, post-harvest handling, and feeder roads, will be prioritized based on the specific needs of these sites to strengthen production and market linkages.

Farm Service Centres (FSCs) will be established around these areas to provide critical support, including inputs, private-led extension and mechanization services, out-grower services and other essential services. The identified sites will be categorized into two classifications: AgriHubs and Food Basket Sites (FoBaSi).

AgriHubs as envisioned in the PSTA 5 strategy, are market-driven agricultural production sites operating on large land parcels with at least 500 hectares and often featuring irrigation systems. They will be mainly operated by large scale farmers and/or investors and equipped with advanced modern infrastructure including irrigation systems and production and post-harvest machinery. AgriHubs will target both domestic and export markets.

Food Basket Sites (FoBaSi) will capitalize on consolidated land sites of not less than 5 hectares that are agglomerate under one management for production, product aggregation and marketing. They will be mainly managed by smallholder farmers organizations with support from the Government over a period of five years after which the food baskets will be autonomous. The production under FoBaSi will be mainly oriented to food security, domestic and the export markets.

Depending on the specific needs and characteristics of the sites, various management models will be adopted:

- **Cooperative-driven model**. This farmer led model is functioning in certain areas, but generally needs substantial improvement in governance and technical capacities. The Government and various development partners will support them with professional management skills to enable them to run autonomously and professionally after 5 years of PSTA 5 implementation.

- **Out-grower model**. Off-takers sign supply contracts and provide services to farmers. This model may work in some value chains, especially export value chains with fewer options for

side-selling. Support will be performance based and directed toward increased production and strengthened market linkages, incentivizing the out-grower to invest in farmers and farms.

- **Land-leasing model.** A farmer or investor takes over the production and pays landowners a fixed fee, or possibly a share of revenues or production, and they may be employed as workers as well. Under this model, the role of the government is to ensure facilitation and fairness between the parties.

Strengthening the Country's commodity reserves to address market volatility and relieve pressure on the production sector. Given the price volatility seen in recent years and the foreseen instability from climate change, the Government will not only invest in expanding the national strategic reserves for grains but will also strengthen private-led commodity reserves. Whilst production from Food Basket Sites and AgriHubs will increase, the core mandate of these reserves will be to secure the most affordable food staples available while limiting the food inflation. Meanwhile, the core focus of the agriculture sector will be transitioning into sustainable commercial models.

New and focused model for improving household resilience. Support to vulnerable households will be focused on facilitating graduation out of poverty while mitigating risks affecting household production. The focus will be on food access, nutrition, and climate resilient production.

Increased emphasis on research. Research in modern, climate and nutrition smart technologies will be critical for the transformation. Several centres of excellence will be established to provide demand-driven innovation, facilitate coordination with research networks and education institutions, and ensure uptake through training and collaboration with the private sector.

National Agri-food systems coordination. Under PSTA 5, with the adoption of complex approaches such as Agri-food systems and AgriHubs, the role of the public sector is gradually transitioning from a "tactical" implementing role to a "strategic" facilitating role. This shift will pave the way for increased participation and significant interventions by the private sector and non-governmental institutions in supporting the advancement of Agri-food systems. This shift entails establishing robust regulatory frameworks, crafting incentives, and designing programs with systemic impacts. It also requires a strong commitment to robust knowledge management and the establishment of effective Monitoring, Evaluation, and Learning (MEL) systems to ensure continuous improvement in the impact of investments in Agri-food systems. At the central level, the MEL system will be necessary to align institutions with this more strategic role, coordinate and guide the efforts of private, governmental, and non-governmental entities in their implementation roles.

14. THEORY OF CHANGE

IMPACT (2028/29)

Inclusive Economic Transformation

Agriculture growth	Agriculture exports revenue
>6%	1,540 Million USD

Women in agriculture with adequate empowerment	Off-farm jobs in agri-food systems
100%	644,204

Improved Food and Nutrition Security

Percentage food secure HH (CARI indicator)	Stunting rate
88%	15%

Dietary diversity score	Food self-sufficiency ratio
8.0	100%

OUTCOMES

Production

1.1 Modernized Crop Production and Productivity

1.2 Modernized Animal Resources Production and Productivity

Markets and consumers

2.1 Boosted agriculture export

2.2 Strengthened Market linkages and post-harvest infrastructure

2.3 Improved food security and nutrition

Systemic enablers

3.1 Research and Technology Transfer for Agri-system transformation

3.2 De-risking Agriculture for increased resilience

3.3 Agri-food systems digitalization

3.4 Agri-food systems Planning and Coordination

CHALLENGES AND OPPORTUNITIES

Supply side (Production)

- High value products
- Land scarcity
- Poor farmer organization
- High degree of subsistence farming
- Climate change

Demand side (Markets)

- Significant export potential
- Weak linkages between farmers and off-takers
- Food price volatility
- Poor nutritional status

Systemic enablers

- Youth and women inclusion and digitalization
- Low uptake of agriculture finance
- Gaps in private and public sector synergy
- Limited inter-institutional coordination

Priority Area I

Priority Area I: modernization of agriculture and animal resources production for climate-resilient Agri-food Systems

This Priority Area covers the production side in the Agri-food systems focused on increasing crop and animal resources production. Land stands out as the scarce production factor, highlighting the necessity to improve land productivity, which would yield the most significant impact on the Agri-food systems. This requires a new approach to address land fragmentation, land health, climate change adaptation, inputs, crop pest and disease control, agriculture water resources management and mechanization. Simultaneously, efforts will be directed towards enhancing and diversifying incomes and diets through the improvement of animal resources production systems. This endeavour involves bolstering infrastructure for livestock production, optimizing animal feeding, refining breeding techniques, and strengthening animal health systems. By elevating productivity levels at the farm level and considering climate change, the groundwork is laid for increased incomes, food security, and increased resilience across the agricultural landscape.

Outcome 1.1 Modernized crop production and productivity

As indicated in previous sections, there has been substantial uptake in agricultural inputs, irrigation, and mechanization in the PSTA 4 period. However, despite the concerted efforts and substantial investments over the past five years, the anticipated evolution in production and productivity has yet to materialize. Challenges persist, exacerbated by the accelerated impact of climate change, casting uncertainty over the attainment of PSTA 4 targets. The following subsections present a plan to turn this around for the next strategy, but also introduces new priorities reflecting the emerging landscape.

Particularly, PSTA 5 puts higher priority on new production models, selected priority crops and commodities aiming at sustainably increasing productivity with climate smart practices, improved inputs distribution models while leveraging the capacity of women, youth, and the private sector to a larger extent. The selection of priority crops and commodities within PSTA 5 largely mirrors previous strategies, albeit with a particular focus on increasing resilience to shocks and augmenting agriculture production.

The following is an overview of key crops and their anticipated growth trajectories:

Maize: Holds a pivotal role as a cereal in the national diet balance sheet, contributing significantly to both caloric (16%) and protein (13.3%) production. Its importance extends to industrial applications, with a projected production increase of 72% by the end of PSTA 5. Notably, maize serves as a crucial component of the strategic reserve due to its commendable storability.

Irish potato: As a staple food and valuable cash crop, Irish potato production is forecasted to surge by 92% by the end of PSTA 5. The introduction of new varieties suited to lower altitudes promises to broaden production beyond its current niche, particularly in the Eastern Province where land availability facilitates expansion.

Beans: Beans like maize, constitute a significant staple food, contributing 16% to caloric production and 30.3% to protein production. Efforts are underway to address the challenge of low yields through the development of high-yielding varieties and the promotion of climbing beans. Despite productivity constraints, fortified high-iron bean varieties hold promise for nutritional enhancement, with a targeted increase in production of 50%. The promotion of high iron beans is done through linking producers to the school feeding programmes and domestic markets.

Soybean: Soybean is a high-value crop that has garnered attention from the government of Rwanda due to its numerous benefits for both human consumption and the agricultural value chain. Known for

its nutritional value, versatility in food production, and potential as a key input for agro-industries, soybean is positioned as a strategic crop within Rwanda's agricultural transformation agenda. The crop's suitability to Rwanda's agro-climatic conditions further enhances its potential for scaling production and contributing to food security, economic growth, and the development of the agricultural sector. By the end of PSTA 5 implementation, soybean production is expected to double. Additionally, sunflower cultivation will be introduced and tested for higher productivity and potential as complementary or alternative crop to soybean, especially in processing industries.

Cooking Banana: With its substantial contribution to both caloric (15%) and protein (5.3%) production, banana stands as a vital alternative to Irish potatoes. Enhanced production hinges on improved plantation management and the provision of high-quality suckers for replanting, facilitating plantation reconversion. The production of cooking banana is projected to increase by 40% over current annual production.

Wheat: Wheat is an important staple crop globally, providing a significant portion of the calories in many diets. In Rwanda, the demand for wheat has been growing due to changing dietary patterns and the increasing demand for processed foods like bread, pasta, and biscuits. However, the country has traditionally relied on imports to meet its wheat needs, creating an opportunity for local production that is projected to nearly double in the next 5 years. This will help the country in its endeavor to reduce dependency on foreign wheat and contribute to national food security.

Cassava: Acknowledged for its potential for high yields and resilience to climate shocks, cassava contributes significantly to caloric production (13%) and serves as a raw material for various industries. Efforts to bolster cassava production align with PSTA 5 that focus on building resilient and sustainable Agri-food systems. The strategy targets to increase cassava production by 23%.

Rice: Building on yield improvements witnessed during PSTA 4, rice cultivation is earmarked for promotion to reduce reliance on imports, which currently satisfy 40% of domestic demand. Expansion and efficient management of existing irrigated schemes, alongside the establishment of new ones, are pivotal to double rice production as per the PSTA 5 targets.

Fruits and vegetables: The two commodities encompass an important number of species and varieties already in production in Rwanda. They are recognised for their nutritional and economic value. Their production volume will be more than doubled in response to the projected increase of domestic and export demand.

Output 1.1.1 Agricultural land management and production models improved

Situation

The National Land Use and Development Masterplan 2020-2050[96] outlines a growing need for a substantial reconfiguration of rural landscapes to take place over the coming decades. This entails reserving 1,243,300 ha for agriculture by 2050 and concentrating investment toward modern commercial agriculture on the 841,400 ha. that are deemed "highly" suitable for agriculture. Over the next few decades small homesteads are to be gradually consolidated in more concentrated rural settlements in a bid to increase production and promote structural change with more off-farm jobs, and fewer and better paid jobs in agriculture production[97]. Both public and private investment in agriculture development is often complementary to other investments. For example, the returns to investment in production are higher if complemented by investment in post-harvest handling, market infrastructure, and processing in the same location. Most importantly, investment in the management of infrastructure and of farmer organizations is critical for creating sustainable commercial agriculture models linking farmers to markets.

Unfortunately, cooperatives and other farmer organisations often struggle with acquiring the capacity to manage infrastructure, create operations, assets, and offer attractive markets for their members (see Section 3 and Output 2.2.1: Organisational models). Yet, over the past decade, new organizational models have emerged. For example, out-grower service companies in the tea sector, have significantly increased productivity and incomes for farmers and agricultural workers[98]. Another example is NASHO irrigation cooperative (NAICO) Eastern Province which has quadrupled yields over the past decade[99].

Finally, the Gabiro Agribusiness Hub, being completed, is expected to generate significant private investment, substantially improve yields of high-value crops, and create approximately 4,000 jobs. The government is identifying agricultural land that is potential for consolidation, mainly to form the "Food Basket Sites s," primarily owned by smallholder individual farmers or cooperatives, with most plots around 5 hectares and some larger irrigated sites, PSTA 5 aims to develop sustainable commercial large-scale production models in high-potential areas (named AgriHubs in this document), creating market opportunities for all farming households.

Key strategic interventions

1 **Underpin the transition with a Land-use Masterplan and clear regulations and guidelines for land-use and land-lease**. The transition will be supported by a Land-use Masterplan with clear regulations for land-use and land-lease. Districts will identify high-potential areas for agricultural transformation, guiding investments. A comprehensive masterplan will consider socio-economic and agronomic factors, along with improved land-use and lease guidelines. Studies show that younger farmers have higher land productivity, suggesting that well-designed lease regulations can improve productivity, investment, and sustainability[100]. Additionally, since female-headed households own less land than male-headed households, it is crucial to ensure women's participation in land tenure programs. Inclusive land-lease models can optimize land use and increase incomes for both landowners and lessees.

2 **AgriHubs and Food Basket Sites**. The government and partners will invest in AgriHubs and Food Basket Sites by partnering with the private sector, supporting farmer organizations, infrastructure, and market linkages, aiming to enhance food security and create sustainable commercial farming organizations within five years. These sites will be provided with infrastructure, technology, soil fertility management, mechanization, irrigation, and post-harvest support, customized to local needs. Locations

96 GoR, 2020, National Land Use and Development Masterplan 2020-2050

97 GoR, 2020, National Land Use and Development Masterplan 2020-2050

98 Bourque, R, 2020, in it for the long haul: Transformative impact from The Woods Foundation Africa and Gatsby Africa's investments in the Rwandan tea sector

99 Mukeshimana, Gloriose, Christophe Mupenzi, Janvier Ndayambaje, 2023, "Analysis of Irrigation Development to Crop Production in the Kirehe District Case of Nasho Irrigation Scheme", East African Journal of Science and Technology, Vol.12 Issue 1, 2022 Narmah, (P.19 –29)

100 IFPRI, 2024, Rwandan farmer typologies, (forthcoming)

will be prioritized in areas with large irrigation schemes and consolidated plots over 5 hectares. AgriHubs are more market-oriented and big investors-led sites and they will gradually expand to cover Food Basket Sites, where management will be simplified. For both types of agricultural sites, the public sector will facilitate financial incentives, strengthen farmer organizations, and collaborate with the private sector on sustainable projects, monitoring results through MEL (Monitoring, Evaluation, and Learning).

Output 1.1.2: Small-holder farmers supported for household resilience

Situation

Over the past decades, various public programs have aimed at supporting agricultural households, with mixed levels of success. Smallholders have benefitted from initiatives such as input subsidies, including seeds, fertilizers, and cuttings, designed to increase agricultural productivity. Historically, smallholder support under the Crop Intensification Program (CIP) has served a dual purpose: improving household-level food production and contributing to the national production of staple crops.

Key strategic interventions

1 **Support smallholders to create Food Basket Sites (FoBaSi).** Farmers outside Food Basket Sites will be informed about related interventions and supported to create the sites voluntarily. This will be a major step to increase their access to climate resilient technologies. Furthermore, they will be sensitised on the importance of graduating to AgriHubs and becoming more commercial which will increase their agriculture income and reduce poverty.

Output 1.1.3: Urban and peri-urban farming promoted

Situation

Urban and peri-urban areas provide a controlled environment agriculture (CEA) and other cutting-edge agriculture technologies in proximity to urban markets. Such technologies can increase access of city dwellers to fresh and nutritious food, urban greening, biodiversity conservation, and ecosystem resilience. Moreover, peri-urban areas offer opportunities for agri-tourism.

Key strategic interventions

1 **Promote investment and start-ups with high-intensive, climate resilient, and nutrition sensitive production models:** including hydroponics, vertical farming systems; and aquaponic systems, rooftop gardens and mushroom production etc.

2 **Building capacity of youth and women farmers working in urban areas to** foster a business-oriented approach and producing highly nutritious income generating crops such as fruits, vegetables, and nuts. Build capacity in these practices and business models through demonstration sites to train youth and women.

3 **Mainstream agro-ecotourism activities in urban and peri-urban farming areas.** Agro-ecotourism or agri-ecotourism is a blend of agri-tourism and ecotourism activities that PSTA 5 seeks to leverage. It exposes and engages visitors in socially responsible, eco-friendly, and sustainable farming practices and learning about local produce and culture. It is designed to create off-farm activities, on-farm farmer's markets and thus increase farm incomes. Agro-ecotourism sites, once strategically established and organized, offer visitors participate in experimental farming practices by immersing themselves in the agricultural lifestyle such as cow milking, traditional milk processing, etc. Mainstreaming agro-ecotourism will promote local agriculture products and provide an authentic Rwandan rural experience.

Output 1.1.4: Climate-smart agriculture practices improved

Situation

The country is facing a growing impact from climate change with increasing temperatures resulting in weather related disasters. In addition, Rwanda's topography, compounded by sub-optimal agriculture practices, contributes to significant land degradation and soil erosion, which reduces soil fertility. Remote-sensing based data suggest that the country currently has about 1.1 million ha at risk for soil erosion, of which about 867,000 ha. are currently insufficiently protected[101].

Building on Rwanda's Nationally determined contributions (NDC) 2020 and the revised Green Growth and Climate Resilience Strategy (GGCRS), PSTA 5 outlines a bold strategy for protecting all agricultural land at risk within this strategic period. This will substantially reduce both the impact of climate related disasters by reducing the ongoing depletion of soil quality and reducing greenhouse gas emissions. Consequently, this will sustainably increase long-term productivity and nutritional outcomes for small-holder farmers and vulnerable groups.

There will be a need for substantial resources and capacities to adapt to the impacts of climate change and manage floods and soil erosion across the Rwandan watersheds. This includes investment in climate smart practices and land husbandry such as Conservation Agriculture practices, terracing, nature-based solutions, agroforestry, improved fertilizer recommendations informed by soil maps, increased use of lime, organic fertilizers, and soil conservation. Furthermore, many climate-smart techniques have improved nutrition potential - for example, agro-forestry and upstream planting of orange fleshed sweet potatoes. Policies and stakeholder coordination nationally and within catchments will be required for successful implementation.

Moreover, weather and climate conditions are among the factors governing agriculture activities, they have a very significant effect on the performance of the agriculture sector in Rwanda. The agricultural sector is highly dependent on weather conditions and at the same time vulnerable to climate and weather-related risks, including prolonged droughts, erratic rains, floods, hailstorms and landslides.

Key strategic interventions

1 **Promote Integrated Watershed Management Approach.** Catchment restoration requires involvement of stakeholders ranging from the national level to land-users within the catchment. Sub-catchment committees will be established across all Level 3 catchments across the country to coordinate and plan interventions that respond to the unique condition of each catchment. The committees will be part of restoration design and approve activities to restore the catchments. Relevant activities include establishing terraces, agroforestry, storm-water management and other solutions to strengthening land health, carbon sequestration, and biodiversity.

2 **Climate Change adaptation and Mitigation Measures.** As Rwanda advances its efforts in agricultural intensification to boost productivity, it will emphasize sustainability measures such as promoting conservation agriculture (CA). Conservation agriculture entails various practices, including minimizing soil disturbance, preserving soil cover, diversifying crops, integrating nutrient management through customized application of organic and inorganic fertilizers, adopting agroforestry systems, integrated pest management strategies, implementing efficient irrigation methods, and integrating crop-livestock systems.

3 **Establish climate smart information systems and advisory services.** Weather and climate conditions significantly impact agriculture in Rwanda. The sector is highly dependent on weather and remains vulnerable to climate-related risks like droughts, erratic rains, floods, hailstorms, and mudslides. To enhance farmers' resilience, it's crucial to improve access to timely and affordable weather information. However, access alone is not enough; the information must be clear, actionable, and meaningful for

101 IUCN, 2022, The State of Soil Erosion Control in Rwanda

farmers and decision-makers. The private sector will be supported to help disseminate customized weather information and advisories to farmers.

4 **Enhance weather and climate information dissemination.** Providing timely and affordable weather information and advisories and empowering farmers with precise, actionable weather information for enhancing crop management, productivity, and resilience against weather variability is very important in building the adaptation capacity of farmers. In addition, the weather information and advisory should be customized and tailored to guide activities and decisions of farmers towards optimizing the efficiency of their activities.

Output 1.1.5: Irrigation and water resource management improved

Situation

Irrigation is critical for increasing productivity and mitigating climate-driven drought risks. Rwanda largely depends on rainfed agriculture, with 71,585 ha irrigated by 2023 versus a potential of 596,810ha. While some irrigation and watershed projects perform well, others face underutilization, poor maintenance, and limited access to affordable energy. Cooperatives and water user organizations require capacity building to develop viable business models for maintaining and replacing infrastructure.

PSTA 5 prioritizes expanding irrigation by completing ongoing large-scale schemes, although planning delays, feasibility studies, and infrastructure challenges remain barriers. Establishing large-scale irrigation schemes typically takes five years, requiring substantial water and electricity supplies in remote areas. New large-scale schemes will be planned for the next strategic phase. Small-scale irrigation will be prioritized in PSTA 5 due to its faster implementation and broader farmer reach. However, running costs, especially for fuel, pose challenges. To address this, solar-powered small-scale irrigation systems will be piloted and potentially scaled up.

Sustainability and broad access to irrigation remain key objectives. This includes training farmers, supporting youth-driven organizations to manage large-scale schemes, and promoting water harvesting techniques. Maintenance models and capacity-building initiatives will be critical to ensuring long-term irrigation success for both large- and small-scale projects.

Key strategic interventions

1 **Expand and optimise large-scale irrigation.** The strategy aims to activate 20 schemes covering 45,000 ha with existing feasibility studies, initiating 19 new schemes across the country. Priority is given to areas with well-functioning farmer organizations, high agricultural potential, and commercial value, ensuring cost-effectiveness and sustainability in new and rehabilitated marshland irrigation schemes. Furthermore, investments will also put into maintenance and rehabilitation of the existing schemes.

2 **Roll out Small-Scale Irrigation Technologies (SSIT).** Will be rolled out to generate more rapid results. Solar driven equipment will be piloted to reduce running costs for farmers. At least 30% of the SSIT shall be given to women farmers, to even out the existing gender disparity where for example 16% of men headed households have access versus 10% of female headed households[102].

3 **Promote water harvesting.** The government has successfully increased farmers' access to water-saving technologies and equipment like dam-sheets and rainwater harvesting facilities in drought-prone areas. The Pilots of water-saving technologies and their dissemination will continue in the coming period.

4 **Build alliances for implementation and maintenance of irrigation schemes.** Strong organisations to manage irrigation schemes are critical for ensuring the organisational model will be specific to each scheme. Irrigated land will be prioritised for AgriHubs to manage while outside AgriHubs, the scheme will be managed either by private companies, cooperatives, or water user's organisations.

102 NISR, Agriculture Household Survey, 2020

Consideration will be given to the capacity of managing entities and they will be supported according to their needs.

5 **Promote water saving and efficiency technologies to increase water productivity.** This initiative is aimed at standardizing and improving the quality of irrigation methods throughout Rwanda. The RAB Centre of Excellence for Mechanization will broaden its focus to encompass irrigation, establishing itself as a key centre for training and research for both farmers and irrigation experts. This will be in collaboration with the Rwanda Institute of Engineers (RIE), which plays a critical role in educating and enhancing the skills of irrigation professionals.

Output 1.1.6: Access to agricultural Inputs for climate-resilient production improved

Situation

Rwanda has seen significant progress increased in adoption of improved seeds and fertilizers from 2018 to 2023, reflecting an ongoing shift to improved agriculture practices. The use of quality seeds surged during this period, with Season A uptake for small-scale farmer increasing from 12.5% to 36% and large-scale farmer uptake increasing from 53% to 86%[103].

Furthermore, Rwanda has achieved remarkable self-sufficiency in seed supply for maize, soybean, and wheat through enhanced local seed production, reducing dependency on imported seeds[104]. This achievement is credited to the active participation of both private and public sectors, significantly surpassing the targets set by PSTA 4[105].

On the other hand, concerns about seed quality persist, especially for hybrid maize and horticulture seeds, indicating a need for continued focus on producing high-quality seeds to meet agricultural standards and to get climate-resilient and bio-fortified seeds in the country (See Output 3.1.1)[106].The period also saw the application of inorganic fertilizers double from 32 kg/ha in 2017 to 70.3 kg/ha in 2023[107], and uptake of organic fertilizers increased from 48.2% of farmers to 83.4% in Season A[108].

However, the reliance on inorganic fertilizers without proper soil amendment has not translated into proportional yield improvements. In some cases, fertilizers effectiveness is compromised by the absence of soil information and limited availability of complementing organic fertilizers. Quality seed use is foundational to the desired agriculture modernization. Guided by the Rwanda Seed Strategy and Investment Plan anchored on PSTA 5, a robust and vibrant private led-seed system will be developed that complies with level five of seed industry requirements. Rwanda's seed system will be fully accredited internationally (ISTA, OECD, UPOV), and the seed industry will constitute a significant contributor to agriculture exports in addition to satisfying local demand.

103 NISR, Seasonal Agriculture Survey, 2018 and 2023.

104 "RWANDA ENDS SEEDS IMPORT" – RAB Website Source: https://www.rab.gov.rw/1-1/news-details/rwanda-ends-seeds-import#:~:text="In%20this%20season%2C%20we,Minister%20said%20in%20the%20interview

105 PSTA 4 – MTR. Page 50-51.

106 Consultations with farmers in Kigali, Northern Province, and Eastern Province

107 MINAGRI Annual report, 2023 (Page 10)

108 NISR, Seasonal Agriculture Survey, 2018 and 2023.

Key strategic interventions

1 **Promote functional Farm Service Centres.** FSCs are hubs providing farmers with a complete range of services including quality inputs, capacity building information, finance, technology, and market linkages[109]. They will be established to address previous issues related to delays in availability of timely delivered quality inputs in the required quantities. FSCs will be local hubs for entrepreneurship and job creation for professionals in various agriculture services and inputs.

2 **Increase local production and storage of improved seeds and fertilizers in partnership with the private sector.** Local seed production will be strengthened by focusing on improving quality through variety maintenance, basic seed production and quality inspection. The priority for seed development is climate resilience, market preference, nutrition content, and yield potential of new varieties. Local production of organic fertilizers. Local production of inorganic fertilizers will be promoted. Moreover, ongoing production of local organic fertilizers will continue[110], and a strategic seed reserve will be established to support farmers in emergencies (see Output 2.3.4).

3 **Increase efficiency of agriculture inputs with soil testing and bio-fertilizers.** Recommendations based on soil tests and crop suitability maps to ensure the right quantity and blend of various organic and inorganic fertilisers is used in a certain area for a given crop.

Output 1.1.7: Plant health management enhanced

Situation

Plant protection and pest management are crucial in Rwanda's agricultural sector due to diverse crops facing increasing pest pressure. The National Agriculture Policy emphasizes the need for integrated approaches to manage pests sustainably. Yield losses from pests such as potato bacterial wilt and late blight can reach 100%, threatening food security. Other pests, such as fall armyworm and Striga weed, also pose significant challenges. Cassava production suffers from diseases like cassava mosaic disease and cassava brown streak disease, with estimated yield losses at 100%. Coffee production faces annual losses of up to 40% due to coffee leaf rust and significant damage from insect pests like the coffee berry borer. The control of diverse crop pests that damage crops continue to be critical, especially when compounded with the impact of climate change. Protective measures include using pest-resistant cultivars, cultural control, biological control, pesticides, and quarantine regulations

Key strategic interventions

1 **Carry out pest surveillance, risk assessment, and information systems.** Implement a comprehensive pest surveillance and monitoring program aimed at tracking the occurrence, spread, and intensity of pests and diseases impacting both crops and natural environments. This entails deploying skilled personnel in the field, leveraging remote sensing technology, and setting up early warning mechanisms to swiftly identify pest outbreaks. Moreover, Disease Incidence should be monitored statistically though the Seasonal Agriculture Survey.

2 **Build public awareness and capacity building in plant protection to enhance the connection between surveillance and practical application.** Results from the Pest surveillance will be communicated through different communication channels and the public will be given capacities of how to deal with plant health identified issues.

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109 Existing agro-dealers or agriculture cooperatives may collaborate to form these centres. Six farm service centres are already established in 6 districts including Nyabihu, Karongi, Ngororero, Bugesera Gatsibo and Nyamagabe and have started providing services to farmers.
(CNFA.org/farm services centres)

110 "RWANDA LAUNCHES A FERTILIZER BLENDING FACTORY WITH AN ANNUAL CAPACITY TO BLEND 100,000 TONNES" – MINAGRI website source: https://www.minagri.gov.rw/updates/news-details/rwanda-launches-a-factory-with-an-annual-capacity-to-blend-100000-tonnes-of-fertilisers

3 **Use IPM techniques in extension.** Institutionalized in Farmer Field School (FFS) and extension system from farming to post-harvest as well as promoting the use of biodiversity in agricultural systems to control or reduce pests and diseases.

4 **Enforce the regulatory frameworks and biosecurity measures.** Enforcement of quarantine protocols and phytosanitary measures to reduce infiltration and spread of pests and diseases. For import/export activities access to superior plant materials will be balanced against bio-security risks. Furthermore, improving the process for registration and certification of biopesticides and biofertilizers.

Output 1.1.8: Mechanization and labour-saving technologies promoted

Situation

The agricultural sector in Rwanda is heavily reliant on manual labour, impacting overall productivity and efficiency across various crop value chains, including priority crops like rice and maize. Just about 1% of farmers use mechanization[111]. From ploughing to harvesting and post-harvest handling, most activities are labour-intensive, affecting the workload especially for women who mostly do the fieldwork[112]. Even the application of fertilizers and pesticides is primarily manual, posing health risks to the farming community. This situation mirrors the current state of mechanization in Africa which remains relatively low compared to other continents with 65% of farms dependent on human labour, 25% are powered by drought, and 10% by engine power[113]. PSAT 5 efforts towards mechanisation will target suitable solutions considering land availability and topography.

Key strategic interventions

1 **Operationalize the Centre of Excellence for mechanization.** The centre will research, develop, and produce agricultural machinery as well as training users. Partnerships will be established to higher education, TVET, and research institutions. Research and dissemination will be targeted to identified needs amongst farmers.

2 **Enhance entrepreneurship and innovation for mechanization with innovation fund (de-risking facility).**

3 **Incentivize uptake of mechanization through training and financial incentives to farmers and value chain actors.** This will attract investment and entrepreneurship in the mechanization space comprising for example assembly, distribution, importation, and maintenance of equipment. Priority will be given to introducing mechanization technologies tailored to the needs and capacities of women farmers such as power tillers, small-scale tractors, and portable threshers.

4 **Promote Sustainable Practices.** The strategy underscores the importance of adopting mechanization that aligns with environmental conservation and natural resource preservation. Advocacy for practices such as direct sowing, minimal tillage, land levelling, and crop residue retention will be prevalent.

Outcome 1.2: Modernized animal resources production and productivity

Animal products have been the fastest growing agricultural sub-sector over the past decade including the PSTA 4 period where output grew by 8.5% per year on average[114]. Animal product value chains present excellent opportunities for generating incomes to farmers and value chain actors and highly nutritious food for the population. Whilst the beef and dairy value chains remain large and important, other value chains such as eggs, fish, poultry, pigs, honey, and rabbits are emerging as nutritious high-

111 NISR, Seasonal Agriculture Survey, 2023

112 MINARI, 2019, Women and Youth Mainstreaming Strategy

113 Africa Agriculture Status Report, 2023. Page 68

114 NISR, National Accounts

value alternatives with lower feed intensity. Rwanda's comparative advantage is expected to be in these value chains given the scarcity of land.

Despite the progress, only 60% of households consume protein rich food[115], and there is still a significant untapped potential to grow the production further and close the gap. This outcome addresses key challenges and opportunities related to animal husbandry practices, breeding, animal health, affordable feeds, finance, and relevant infrastructure for production and value addition. These factors are complementary and therefore the strategy will take a clustered approach concentrating efforts toward tangible results.

Output 1.2.1: Animal husbandry and infrastructure in animal hubs improved

Situation

Addressing the core challenges to build value chains requires concentration of complementary infrastructure and capacities relevant to the specific value chain. For optimal use of resources and capacity, the strategy will adopt a spatial approach concentrating the provision of public investment and services in high-potential areas for each animal value chain and creating opportunities for private investment. There will also be investment in feeder roads, post-harvest management, and market infrastructure to strengthen the linkages in the Agri-food systems (see Outcome 2.2). This approach allows for tailoring interventions to local contexts. For example, supporting compliance with the newly adopted zero-grazing policy in the Eastern Province, and other local factors.

Key strategic interventions

1 **Demarcate AnimalHub locations for specific value chains in collaboration with Local Governments and communities.** This includes aggregation of producers in specialized cohorts with the common interest of providing training, increasing access to inputs, and access to infrastructure and coordinating marketing, and the full value chain supported by digital platforms. Initially, each district will select one animal value chain to focus on and plan the required investment in relevant infrastructure. Investment will be tailored to the local contexts with provision of value chain specific infrastructure and services. For example:

- **Milk and Dairy:** water infrastructure, feeder roads, Milk Collection Centers (MCCs) and Milk Collection Points(MCPs), manure management. In zero-grazing zones, there will be focus on animal feed production, water management, and standard compliant sheds.
- **Beef farm, sheep, and goats:** to be in areas less suitable for cultivation. Focus on proximity extension, veterinary services, and value addition.
- **Pigs:** Focus on value addition, specialized extension and veterinary services, and feed storage in selected locations.
- **Poultry:** Focus on feed and specialized vet services in hub locations. Support out-grower models such as with nucleus farms providing poultry to surrounding small-scale farmers.
- **Aqua Parks:** Provision of suitable infrastructure, fish-feed, specialized veterinary services. For cage aquaparks environmental compliance will be emphasized, whereas for pond aqua-parks there will be focus on extension services and involving local communities.
- **Honey:** Hubs will be located near forests adequately distant from cultivated areas. Focus will be employment creation for local communities providing modern equipment, capacity building, and bee queens.

2 **Enforce and build capacity to implement the zero-grazing policy in Eastern Province.** The Eastern Province will be a Hub for livestock in which optimal production entails protecting animals in sheds considering the climate conditions in the area. Farmers are to invest in improving livestock sheds and water infrastructure in compliance with RAB and requirements for the design, construction, and

115 NISR, CFSVA, 2021

operation of animal sheds. Public support is provided in the form of capacity building, and provision of dam-sheets and other farm machinery.

Output 1.2.2: Sustainable animal breeding established

Situation

Genetic improvement drives Rwandan livestock development, with modern pig husbandry practices, Artificial Insemination (AI) centers, and advanced semen delivery technology boosting pig production. In dairy, the Songa bull center supports local bovine semen production, enhancing yields by crossbreeding resilient local cows with high-yielding exotic breeds.

The breeding systems in Rwanda face multiple challenges: Firstly, limited access to high-quality parent stock and inbreeding small ruminants has led to lower productivity and quality of seep, goat, and pig meat. Secondly, there is limited access to bovine AI services due to logistical issues and insufficient skilled AI technicians and semen conservation and delivery systems leading to a low success rate of 40%[116]. Consequently, most farmers prefer natural mating which has its own challenges: disease transmission (e.g., Brucellosis), inbreeding, and poor genetic potential of the bulls affecting productivity of the offspring. Thirdly, production of poultry, fish, and honey are severely limited by availability of chicken, fish fingerlings, and bee queens.

Key strategic interventions

1. **Establish breeding centres for different livestock.** Breeding centres including a centre of excellence will introduce improved breeds to maintain access to healthy productive animals and genetic diversity within the herd or flock. The centres will provide access to embryo transfers and other fertilization techniques and provide capacity building for AI technicians.

2. **Establish certified hatcheries for poultry and aquaculture, and bee queen rearing centres.** These will be established and expanded to meet the demand and requirements for substantially increasing the production of honey, eggs, white meat.

3. **Establish LN2 (Liquid Nitrogen 2) plants near AnimalHubs to ease logistics for AI provision.** Skill development plans to increase AI success rate in cattle to 60%.

4. **Implement a holistic policy and standards framework.** For sound livestock breeding practices, integrating regulations, policies, breed standards, herd/flock books, and identification systems. This comprehensive approach aims to drive sustainable genetic resource management, fostering positive and enduring changes in Rwanda's livestock sector.

Output 1.2.3: Access to animal feed improved

Situation

The animal feed sector faces challenges including high cost of raw materials, poor quality, and storage constraints, limited regulatory compliance amongst feed traders. Additionally, resource and infrastructure limitations, including water shortages, insufficient research, and a shortage of large-scale feed processing capacity, further impede the growth of improved forage production and overall feed processing capabilities[117]. Furthermore, local factories struggle to overcome regional competition due to high operational costs[118], hindering competitiveness. Addressing these challenges involves efficient land use, access to quality seeds and water, and reducing machinery costs for farmers.

116 RAB, 2019. ADOPTION OF ARTIFICIAL INSEMINATION AND SUCCESS RATE IN DAIRY CATTLE IN RWANDA

117 Rwanda livestock master plan (2017/18-2021/22)

118 due to being a landlocked country.

Fundamentally, there is competition between producing raw materials for animal feeds versus for human consumption, which typically have higher value[119]. Yet, over the past few years, opportunities have emerged to produce animal feed sources on small land and areas not suitable for staple crops. For example, producing protein from insects and producing climate resilient grasses, which can be grown at high intensity at hydroponic facilities. For example, Napier grass cuttings, Brachiaria, Panicum, Chloris, Leucaena, Panicum, Disodium, Mucuna and Barley fodder[120].

Key strategic interventions

1 **Increase the nutrient reserves of animal feed plants to improve access to raw materials.** Increasing grain storage capacity and sourcing animal feed ingredients locally or globally at relatively low cost, particularly during periods of high grain production, would reduce production expenses (see 2.3.3).

2 **Encourage PPP models promoting investment and entrepreneurship to produce alternative sources of animal feed.** Including circular economy concepts such as insects for animal protein, food waste, hydroponics for climate resilient grasses. Support to farmers in fodder production and conservation including acquisition of the machinery used in fodder harvesting and processing.

3 **Strengthen R&D and dissemination of climate-resilient fodder varieties.** To respond to the effects of climate change on livestock nutrition, it is important to do research on drought-tolerant fodder grasses and legume species.

Output 1.2.4: Animal health systems strengthened

Situation

Over the past decade, the demand for veterinary services in Rwanda has grown due to increased livestock production and emerging animal diseases like Rift Valley Fever (RVF), Swine Erysipelas, African swine fever (ASF), and Peste des Petits Ruminants (PPR). Effective animal health systems are crucial for early diagnosis, prevention, and control of diseases, particularly zoonotic ones that can spread across borders. These diseases limit trade, food security, and public health, especially in rural areas. The situation is worsened by climate change, antimicrobial resistance, and increased animal and human movement. A multisectoral approach, as outlined in Rwanda's One Health Policy, is needed to address these challenges. Expanding animal health facilities, improving disease surveillance, and enhancing preparedness are key. Additionally, there is a need to improve farmers' knowledge of diseases, biosecurity, and access to veterinary services, while addressing gaps in veterinary human resources, particularly in emerging value chains.

Key strategic interventions

1 **Provide affordable and sustainable proximity veterinary services to farmers to enhance animal and zoonotic disease prevention and control through fostered public private partnerships and One Health approaches.** Establish clinics with veterinary doctors and paraprofessionals across the country. The clinics will emphasize vaccinations and disease surveillance. Trained Community Animal Health Workers (CAHWs) will be providing basic animal husbandry and health services in communities. Affordability will be facilitated through implementation of Veterinary Sanitary Mandate (VSM) and through collaboration with cooperatives and off-takers as per Customized Agriculture Extensions System (CAES). Furthermore, to strengthen capacity for veterinarians, paraprofessionals, livestock owners, and abattoirs for detecting and reporting unusual animal health incidents. And finally, to collaborate across agencies to safeguard Rwanda against the risk of AMR and incursion of diseases.

119 PSTA 4 MTR Final Report.

120 MINAGRI, 2022. Annual Report 2021 – 2022 FY.

2 **Strengthen national epidemio-surveillance programme for early warning and monitoring of animal diseases.** A unit in RAB will be established to identify outbreaks and emerging diseases early, provide information for implementing control and prevention measures, research, data collection, and investigations on animal health and disease prevalence, and finally to report on animal health status every 6 months. Furthermore, to upgrade veterinary laboratories capable of diagnosing and differentiating relevant infections or infestations. Finally, veterinary laboratory service diagnostic capacity will be strengthened across the country to improve quality and accessibility.

3 **Strengthen digital technologies and innovations to transform veterinary services.** Update and maintain livestock registry for cattle and other livestock, both for genetic planning and disease mitigation. The demand for digital skills and innovations is expected to rise in the future within all stakeholder groups of the animal health sector. Beyond health management, this system will have several other use cases for planners and value chain actors, and there will be a need to capacity building on digital technologies across the value chains.

Output 1.2.5: Fisheries and aquaculture developed

Situation

Rwanda's fisheries and aquaculture sector made significant strides in the PSTA 4 period toward boosting fish production. Efforts included enhancing fingerlings production, promoting investments in aquaculture, and fisheries, alongside robust extension services and surveillance[121]. Whereas capture fisheries cannot go much beyond its current level of about 40,000 MT/year, there is significant potential to increase aquaculture production. This modern approach to aquaculture promises to enhance fish production through efficient resource use, minimal environmental impact, and improved fish growth rates. The main challenges for further growth are cost of fish-feed, availability of fish-fingerlings, access to specialized extension and veterinary services, infrastructure, and adequate biosecurity measures.

Key strategic interventions

1 **Establish the national aquaculture research centre.** The centre will be tasked to provide fingerlings by conducting adaptability trials of various fish species of economic value across various regions of the country to integrate them into production, as well as testing feeding trials for locally produced feeds and developing strategies for disease prevention and treatment, among other responsibilities.

2 **Develop certified private hatcheries.** The government will engage private investors to set-up certified hatcheries.

3 **Demarcate sites for aquaparks.** Clustering of fish-farms to provide infrastructure, extension and veterinary services, coordination for bulk purchase of inputs, and aggregation of produce, and value addition.

4 **Promote private investment in fish-feed plants.** Facilitate access to affordable raw materials through public bulk payments and storage. Use de-risking to incentivise investment.

5 **Promote circular economy models for providing affordable fish-feed.** De-risk entrepreneurship and investment in technologies that use animal waste, integrate with plant production etc.

121 MINAGRI Annual reports, FY 2020-21 (page 69), FY 2021-22 (page 63) and FY 2022-23 (page 49)

Output 1.2.6: Beekeeping developed

Situation

Honey production has considerable potential for exports, value addition, and income generation, not least for vulnerable groups. Over the PSTA 4 period output increased from 5,105 to 7,250 MT (2018-2023). Training initiatives targeting young beekeepers, emphasizing modern methods and advanced techniques for increased productivity contributed to this growth[122]. It is reported that there are 120,000 beekeepers in the country of which 35% are using modern methods.[123] The critical constraints to increased production includes access to modern equipment and bee queens plus royal jelly, and potential health threats from pesticides on cultivated land.

Key strategic interventions

1. **Promote modern sustainable beekeeping practices in suitable zones.** Proximity coaching and field trials to enhance capacity of youth, women, and people with disabilities in key beekeeping zones[124] such as Nyungwe, Gishwati, Mukura, Virunga National Park, Akagera National Park, and Ruhande/Arboretum. Support in the zones will comprise access to modern equipment and queens; training in IPM, best apiculture practices, disease management, business management.

2. **Promote market linkages for high-value international markets and processing.** This will facilitate investment at production level. Encourage value addition with honey-based items like mead and cosmetics in local communities through the de-risking facility (see Output 3.2.1).

3. **Strengthen national research and development and regulations.** Research into bee genetics should be promoted to sustain the development of bee strains that are more resilient to diseases and environmental stressors and developing customized educational programmes for beekeepers. Moreover, research efforts should concentrate on increasing the quantity of melliferous plants and pollinator-friendly flora around apiaries and IPM techniques. These will inform development and implantation of regulations and policies to protect bee populations in the selected zones.

122 MINAGRI, Annual Report 2022/23

123 "Revitalizing Rwanda's beekeeping to increase quality and quantity of bee products"

https://www.fao.org/rwanda/news/detail-events/ru/c/1373162/

124 MINAGRI Annual Report, 2023. (Page 50)

Priority Area II

Priority Area II: Inclusive markets and post-harvest management for sustainable Agri-food systems.

Priority Area II considers the demand-side in the Agri-food systems, i.e. post-harvest handling, value addition, markets, and consumers. Developing the domestic market is essential for food security and nutrition, while export markets provide opportunities for increasing incomes and attracting investment. The aim is to transition agriculture from subsistence to commercial farming, through enhancing market access and increasing incomes for farmers. Strengthening the demand-side will be the basis for commercialization of production, hence catalysing agriculture transformation and ensuring food security and nutrition.

Outcome 2.1: Boosted agriculture exports

There are compelling reasons to boost agriculture exports. Firstly, exports are relevant for the trade balance. But equally important, agriculture exports carry the highest potential for agriculture transformation through their potential for attracting private sector investment and linking farmers to high-value markets.

Agriculture exports revenue increased by USD 235 million between 2018 and 2023[125], but there is still room for substantial growth. The main factors to drive growth will be to increase the branding and value of exports and to increase the production volumes.

Output 2.1.1 Export crops expanded

Situation

The core of increasing Rwanda's agriculture exports is to boost production volumes in existing value chains and to promote new value chains with export potential. Export value chains are relatively well-functioning in general, but each value chain has unique bottlenecks hampering further development. In coffee, the main problem is low yields due to ageing trees, climate change, and sub-optimal agricultural practices. Whereas coffee has excellent market prospects, investing in rejuvenation is limited due to the long maturity period of 3-5 years combined with relatively low farmgate prices.

In contrast, tea farmers have seen increased incomes and production in recent years from successful out-grower models[126], but there is limited value addition, and farmers face difficulties getting tea puckers. Both coffee and tea plantations are vulnerable to fluctuating temperatures related to climate change. In coffee, mulching and intercropping with shade crops (i.e., banana) is a possibility, but with increasing climate change, production at lower altitudes will become increasingly difficult and new production sites will be needed at higher altitudes.

The budding horticulture value chains such as avocado, French beans, chilli and others have shown significant market potential over the past few years, but struggle with nascent business structures, inadequate and costly cold-chain logistics, cost of seeds, traceability, access to standards, and agronomic skills for export-oriented production.

125 NAEB Statistics

126 Gatsby Foundation, 2020, IN IT FOR THE LONG HAUL: Transformative impact from The Wood Foundation Africa and Gatsby Africa's investments in the Rwandan tea sector

Key strategic interventions

1 **Demarcate land for exports in AgriHubs.** Land for export crops will be demarcated within AgriHubs, offering access to inputs, services, and post-harvest facilities. Guiding principles for the selection of Hubs will be local growing conditions, income potential, and stakeholder interests. For high-value products, land-lease and profit-sharing models are likely possible.

- **Expand coffee and tea plantations.** New coffee and tea areas will be established at higher altitudes in response to climate change challenges. There will be guidance for improved practices and extension guides for climate smart production, which have been developed[127].

- **Increase the planted area for other exports crops:** areas for other export crops will be identified and designed. Initial Hubs will consider zones for chilli, avocado, French beans, and passion fruit, and others. The focus will be on protected agriculture, traceability, food safety and quality standards compliance, and critical post-harvest facilities.

2 **Promote cost-effective post-harvest handling and processing facilities and their operationalization in the AgriHubs.** This includes cold-chain facilities that are fit for purpose, new technologies for aggregation, quality testing, packaging, storage, transport, and others. Public support to accessing inputs, access to quality and traceability standards, and other services will be planned in collaboration with off-takers. The government will conduct relevant research for optimal agricultural practices and extension services including climate-smart practices, intercropping, and advanced agriculture production systems (e.g., protected agriculture) tailored to the export market.

3 **Unlock growth in new potential export value chains to diversify exports.** Diversifying exports increases resilience against global shocks. When a new potential product has been identified through market intelligence or private sector initiatives, new impediments and structural constraints usually emerge. The Government will adopt a systemic approach to discovering and addressing such impediments through various support modalities such as infrastructure provision, research, capacity building, inputs, advisory for standards compliance, business development support, and financial support.

Output 2.1.2: Rwandan agri-exports de-commoditized

Situation

Rwanda's agriculture exports are dominated by commodities with limited branding and value addition, and producer margins on export crops are limited. For example, the quality of Rwandan coffee has increased significantly over the past decades, yet branding and penetration in high-value markets are less than desired, and Rwandan coffee producers are subject to volatility in international commodity prices and legal barriers in destination countries. The share of fully washed coffee has increased to 76% of total exports, but roasted coffee is less than 1% of coffee exports[128]. In tea, about 25% is sold through direct sales, and value addition is limited. Whereas some value-added products are exported to the region, it remains a small share of total exports. As a result, Rwandan producers have limited market power. For example, in 2023, the average farmgate price for coffee was RWF 410 – under 7% of the average export price at RWF 6,242[129]. Strengthening marketing, branding, value addition as well as creating alternative selling options will increase the market power for Rwandan producers and increase incomes.

127 Reference made to the Green Gicumbi Project managed by Rwanda Green Fund

128 NAEB July 2022- June 2023 Statistics Report

129 NAEB Statistics

Key strategic interventions

1. **Enhance the market share and public diplomacy.** There will be resources allocated towards branding Rwandan high value agri-commodities and strengthening market intelligence in foreign destinations. Also to facilitate direct linkages between Rwandan exporters and foreign buyers and increase Rwanda's market share at international markets.

2. **Strengthen the home market for diversified export products.** Spurring a strong home market for exported commodities will improve resilience against international price shocks. It will also strengthen the country's brand in tourism sectors and increase bargaining power against foreign buyers of products.

3. **Establish and improve agriculture export facilities to promote value addition and diversification of Rwandan agriculture exports.** The focus will be on developing infrastructure, labs, capacity, resources/investments, services, mechanization, packaging across the value chain.

4. **Promote investment in de-commoditization of exports.** The government will proactively seek private investment for developing these export value chains further and transforming the agriculture sector. In addition, viable investment packages will be designed to attract global operators for production, value addition, or infrastructure, and identify. For high-risk/first mover products, public ventures will be considered aiming at crowding-in private investment and creating systemic change.

Outcome 2.2: Strengthened market linkages and post-harvest infrastructures

As outlined in the Theory of Change, the commercialization of farming is identified as a crucial catalyst for agricultural transformation. This necessitates the development of robust market linkages between farmers and their buyers. These linkages take the form of physical (hard) infrastructure, processes, and systems (soft infrastructure) as well as in the relationships established between market system actors. This outcome aims to strengthen these linkages by considering farmer organizations linking the 2.3 million farming households to markets, post-harvest infrastructure, quality standards, value addition, and trade infrastructure.

Output 2.2.1: Organisation models of farmers and value chain actors improved

Situation

With land fragmentation and small plot sizes, effective organisation of farmers is critical for improving their market access and their market power. Farmer organizations in Rwanda are largely dominated by agricultural cooperatives, which are set up to solve input and output market problems. Currently agricultural cooperatives take the biggest share of close to 48% of the total registered cooperatives (4,946 out of 10,563) with 1.14 million members. On the other hand, only 13% of farmers report to be selling through cooperatives [130], and consultations across the country have found low member involvement and ownership due to widespread management and governance capacity deficiencies in most cooperatives. In recent years, new organizational forms such as Out grower Service Companies (OSCs) have emerged with some success in the tea value chain. While OSCs typically address some of the governance and capacity issues, they require significant capital investment to be effective.

130 NISR, 2020, Agriculture Household Survey

Key strategic interventions

1 **Concentrate investment in farmer organizations in AgriHubs.** Public and civil society efforts will be concentrated in farmer organizations to create market linkages to off-takers. Professional management will be established and fully funded in the first year. External support will be phased out over a 5-year period after which the cooperatives shall be financially sustainable.

2 **Establish a dedicated capacity and enterprise development program of agricultural cooperatives to become farmer led enterprises.** MINAGRI in close collaboration and support from MINICOM to establish a capacity-building programme in governance, financial management, member involvement and business development for agricultural cooperatives to ensure sustainability. To separate the management and governance roles within the cooperatives there should be structured incentives or compensation mechanisms for cooperative leaders for effective and efficient delivery.

3 **Encourage partners and the private sector to promote new farmer organisation models (out grower service models and contract farming).** Civil society, farmers and other private sector players are encouraged to develop alternative and innovative models, which improve market access for farmers. Further strengthening farmer organizations through establishing information-sharing platforms, providing extension services, and leveraging digital technologies to disseminate timely and relevant information to farmers through their mobile phones. There shall be specific emphasis on the formation of producer groups among youth and women farmers, encouraging collaboration and collective action in the production and marketing of agricultural products.

Output 2.2.2: Post-harvest handling for reduced losses improved

Situation

Post-harvest handling and value addition are crucial for food quality, safety, and boosting incomes through commercialization and exports. Nutritious food is perishable, so adequate facilities are key to ensuring access to healthy diets. In PSTA 4, the government focused on improving post-harvest handling, reducing losses from 16.4% in 2019 to 13.8% in 2023. However, a recent 2023 study by RAB highlighted significant losses across value chains: maize (13.8%), beans (11.3%), rice (12.4%), tomato (33.5%), cassava (24.8%), and Irish potatoes (25.2%).

These losses are highest during processing and at collection centers, primarily due to inadequate training and extension services on post-harvest handling and marketing.

Key strategic interventions

1 **Carry out post-harvest training to enhance post-harvest handling and storage of perishable nutritious foods and animal products.** Training on various post-harvest practices, tools, and technologies for handling perishable crops and animal products will be given. Thematic training modules on safe handling practices will be developed and disseminated in collaboration with academic institutes and the private sector. There will be specific training sessions on food preservation techniques such as drying, canning, and fermentation targeting women farmers. This empowers women to extend the shelf life of their produce, thus reducing food waste and increasing market opportunities for their products. Innovation on cool chains, drying and preservation and local manufacture of post-harvest equipment and technologies will be encouraged,

2 **Develop a viable private sector driven operating model for post-harvest handling.** The private sector plays the main role in operating post-harvest facilities. An agriculture de-risking facility is to be established to foster public-private partnerships with capacity building and financial support Construction of small-scale rural-based agro-processing units and value addition facilities to allow preservation of crops closer to production sites, provision of transport technologies tailored to the needs of smallholder farmers.

Output 2.2.3: Agriculture commodity safety and quality increased

Situation

Rwanda's informal Agri-food systems are predominantly informal and generally lack proper post-harvest handling. This raises concerns about safety, nutrition, and accessibility of diverse food items. Social and economic factors shape dietary patterns, contributing to preventable food-related diseases, a leading cause of morbidity and child mortality. Key safety concerns include parasites, bacteria, and mycotoxins, posing serious health risks. Aflatoxins, particularly prevalent in maize, ground nuts, chilli, cassava, and dairy, are a significant focus. Rwanda has recently established institutions to promote food safety standards development and compliance, but they face challenges in implementation, in part due to overlapping mandates. Streamlining and empowering these bodies are essential to effectively address food safety issues. Accountability and service delivery must be assessed and improved to enhance their contributions to Rwanda's food safety and quality standards. Requirements for compliance and traceability are on the rise in global markets such as the EU.

Key strategic interventions

1 **Improve institutional coordination.** To ensure efficient utilization of resources, and to optimize the collective impact of the institutions, there is a need for clarified demarcation of the functions and responsibilities of relevant authorities in charge of quality control, standards, rules and regulations, and conservation. Additionally, given the significant impact of these institutions on business outcomes, it is important to include the views of market actors when assessing institutional performance.

2 **Develop standards and a traceability system.** The government will focus on improving food standards, enforcement, and changing behaviours to tackle food contamination and waste, which happens mostly after harvesting and in informal processing places. Additionally, a traceability system will be set up with the aim to trace food in critical commodities, starting with General Agricultural Practices (GAP) certified export products, and gradually rolled out across the Agri-food systems.

3 **Build capacity in testing, and food safety awareness along value chains.** A national program will be rolled out to educate farmers, traders, and local processors as well as Youth and women-led Small and Medium Enterprises (SMEs) on best practices related to food safety and quality standards. This initiative will also provide access to testing and affordable technologies that enhance food safety from production to post-harvest handling. A network of extension services will be established to offer continuous guidance and support.

4 **Business support schemes.** A business support scheme is set to be established, aimed at offering financial and technical SMEs dedicated to advancing food safety standards. This scheme will offer technical advisory services and grants to SMEs that invest in safe food handling practices, adopt food safety management systems, and comply with national and international food safety standards. Priority will be given to address the most serious safety concerns related to consumption of contaminated food.

Output 2.2.4: Value addition increased

Situation

Agro-processing gross value added was about RWF 864 bn in 2022, which is about 64% of total manufacturing sector value added. The World Bank estimates Rwanda's food processing sector to reach US$340 million by 2024, highlighting the growing domestic demand[131]. However, there is a large untapped potential to add more value to agricultural produce. For example, in 2021, only about 8% of the milk production was channelled through Milk Collection Centres, and they were operating at 53%

131 https://www.agroberichtenbuitenland.nl/binaries/agroberichtenbuitenland/documenten/publicaties/2024/04/30/rwanda-agri-economic-outlook/Rwanda+Agri-economic+outlook.pdf

of capacity. Moreover, increasing processing is an opportunity to increase both farmer incomes and nutritious food through fortification.

Key strategic interventions

1 **Promote public-private partnerships with systemic large-scale impact.** Larger agro-processors to be incentivized to act as anchor firms investing in their value chains toward creating systemic impact for farmers and increasing availability of quality raw materials for processing.

2 **Increase investment in local facilities for value addition.** The de-risking facility will incentivize entrepreneurship and investment in local facilities for value addition. Including small livestock slaughter slabs, local dairy plants linked to MCCs, local whole grain flour mills, extending value chains and others.

3 **Build capacity and enforce compliance with food safety and quality standards.** Public institutions and private sector providers will support processors in compliance with standards and food safety regulations at the processing units.

4 **Increase food fortification in processing.** Staple fortification is a relatively cost-effective way to rapidly enhance nutritious outcomes in the short to medium term. The assigned regulatory bodies will support processors to access the relevant certificates to produce fortified food products.

Output 2.2.5: Trade infrastructures improved

Situation

Rwanda's topography hinders the construction of effective transport, logistics, and trade networks. Roads in rural areas are largely unpaved and often in poor condition. In addition, the country's storage infrastructure is limited. While there has been progress in expanding the road network and storage facilities, challenges in the transportation of produce remain. E-Soko data often find over 50-100% price differentials in markets across the country, which is indication of significant market imperfections.

A relatively small share of crop and animal products goes through the formal trade channels. The key impediments are lack of feeder roads, transport facilities, standard storage facilities and limited access to market information. Availability of cost-effective electricity and water to the collection centres and storage facilities is limited. For example, in 2023, only about 8.6% of the milk production was channelled through Milk Collection Centres, and they were operating at 53% of capacity[132].

With additional milk powder factories and dairy plants under construction, there will be a sustained opportunity for increasing the supply. Small livestock slaughter facilities are scarce, thus poor meat quality and safety, leading to low meat exports compared to imports.

Key strategic interventions

1 **Operationalise the Kigali Wholesale Market, community markets, and other strategic facilities.** The Kigali Wholesale Market will be operational in this strategic scheme. Wet markets in local areas are also critical for availability and access to nutritious food, which is often perishable, and livestock markets are available where needed.

2 **Improve transport networks including feeder roads focused toward AgriHubs and Food Basket Sites s.** There will be a concerted effort between MININFRA and MINAGRI under the umbrella of Agri-food systems to avail and improve the transport infrastructure, ensuring swift and efficient movement of agricultural produce.

132 MINAGRI, 2021. Annual Report 2020 – 2021.

3 **Support standards compliance at markets.** To ensure improvement in trade and increase market access, there is a need to follow national and international standards and regulations across various agricultural commodities as a priority. Regulations, enforcement, capacity building and effective market infrastructure will be implemented in collaboration with competent public institutions to develop food standards further.

Outcome 2.3: Improved food security and nutrition

The consumption of nutritious and safe food is a critical aspect of public health and well-being, and it has been on an upward trajectory, driven by various government initiatives, civil society effort, and international partnerships aimed at promoting food security and improving nutrition. This component targets the promotion of stable availability, access, and utilization of a safe, nutritious, and varied diet.

Output 2.3.1: Food security and nutrition improved

Situation

Rwanda's agricultural growth hasn't fully addressed food security challenges; 21% of households are food insecure[133] with child stunting at 32.4%[134]. Food production falls short of national needs by 19% in protein, despite the initiatives like One-Cow-per-Poor-Family that aim at improving nutrition and income amongst the most vulnerable households. Malnutrition is mainly caused by limited consumption of nutritionally diverse foods, and insufficient consumption of animal proteins and diversity in vegetables and fruits. Dietary diversity is 5.5 out of 12 and largely unchanged between 2018 and 2021. It is 6.7 in urban areas and 5.3 in rural areas. Key challenges include lack of animal proteins and costly nutritious foods in rural markets. Economic vulnerability exacerbates food insecurity, with 29.5% of households spending over 65% of their income on food[135]. Malnutrition stems from limited diverse food intake, micronutrient deficiency, and unhealthy diets, impacting children, adolescent girls, and pregnant/lactating women[136].

To combat these issues, the government promotes home gardening, diverse agricultural practices, and nutrition education campaigns. Several policies and tools have been implemented to enhance nutrition interventions. These are for example the Nutrition Sensitive Agricultural Mainstreaming Guidelines 2020, the Rwanda Food Composition Table (RFCT), The Nutrition Sensitive Crop Calendar, The Food Based Dietary Guidelines and ongoing research on biofortified beans and orange-fleshed sweet potatoes contribute to enhancing nutrition interventions. Additionally, nutrition-dense foods such as green leafy vegetables, avocados, and carrots, are promoted with a target to improve dietary diversity and nutrition nationwide.

Strategic public-private partnerships promote nutrient-dense products' consumption through campaigns, cooking demos, and nutrition education. Collaboration ensures policy implementation involving district units, health workers, and technical experts. Joint actions were taken to promote consumption of NDP through Nutrition Campaign, Social Protection, cooking demonstration and kitchen gardens and nutrition education. The government promotes home gardening, diverse agriculture, and conducts nutrition education campaigns.

In PSTA 5, four strategic interventions have been identified to contribute to the Rwanda's vision on eradicating malnutrition:

133 NISR, 2022, CFSVA 2021

134 NISR, 2022, CFSVA 2021

135 NISR, 2022, CFSVA 2021

136 NISR, 2022, CFSVA 2021

Key strategic interventions

1 **Promote consumption of nutritious food stimulated.** Transition to wholegrains and fortified foods, greens, and fruits (school feeding, defence, police, correction facilities etc.) This promotes healthy eating habits and creates a market for producing nutritious food. Where possible, use wholegrains in the grain reserve. Wholegrain processing can produce around 30% more content and is nutritionally superior to refined processing, so it can feed more people with the same number of grains if distributed within its shelf-life period.

2 **Maintain and scale up nutrition sensitive social protection programmes.** Maintain and scale successful social safety nets programmes such as Childhood Development Programs, VUP, and One Cup of Milk per Child Program; to increase accessibility and behaviour change toward nutritious food consumption amongst infants. Still, the high stunting rates calls for other social protection interventions which ensure the well-being of vulnerable populations through better access to quality, nutritious and diversified food, and income generating activities to afford nutritious food and healthy diets. Additional measures will be taken to build a culture for nutritious food. For example, behavioural change programmes, and fruit trees will be planted near schools and in other public spaces.

3 **Promote biofortified crops and industrial food fortification at the household level.** The biofortified staple crops and vegetable varieties can be developed and they contain higher levels of important nutrients such as iron and zinc, addressing deficiencies. A comprehensive food fortification program targeting selected food vehicles will be implemented. This multifaceted approach encompasses firstly, policy development to mandate the fortification of cereals with essential nutrients; secondly, establishment of a regulatory framework with clear standards for nutrient types, levels, and quality control; and, thirdly, stakeholder engagement involving government agencies, food industry players, and civil society for coordination and compliance. Infrastructure enhancements will support the production and monitoring of fortified cereals.

4 **Implementing dietary guidelines and nutrition sensitive agriculture guidelines.** Food-Based Dietary Guidelines (FBDGs) already in place are dietary recommendations expressed in terms of food and diet instead of nutrients, to be understood and used by the populations. Nutrition Sensitive Agriculture (NSA) Mainstreaming Guidelines (2020) provides systematic guidance for the designing, execution, and monitoring of nutrition-sensitive agriculture programs. The guidelines will be underpinned by events and activities to facilitate behavioural change amongst the population.

Output 2.3.2: Households supported in nutrition-sensitive production

Situation

Many rural households, particularly those led by women, face challenges in securing adequate nutrition, income, and resilience against climate or economic shocks. Livestock production offers an opportunity to enhance household food security, diversify incomes, and improve the overall livelihood of families. Additionally, small-scale vegetable gardening can boost nutrition, particularly for vulnerable groups. Supporting women-headed households with animal resources and vegetable production will be a key step in addressing gender disparities and fostering household resilience.

Key strategic interventions

Distribution of Animal resources and Vegetable seeds to families: Eligible households will be supported with cow, small livestock (goats, pigs, sheep, rabbits and poultry). Additionally, they will be supported with Vegetable seeds for the kitchen garden to improve their standards of living in terms of nutritious and quality food.

Output 2.3.3: Food stability and mitigating related shocks ensured

Situation

In recent years, the global landscape of food security has faced unprecedented challenges. The COVID-19 pandemic has not only disrupted supply chains but also significantly increased the cost of agricultural inputs and food commodities. Concurrently, global events have further escalated these prices and led to scarcity of grains and inputs in 2022-24. In reaction to these crises, some countries have imposed export bans on food, compounding the problem and triggering a protectionist cascade that further restricts global supply[137].

Climate change has also aggravated the situation, impacting agricultural productivity more severely than ever before. Extreme weather events have become more frequent and intense, leading to crop failures and a reduction in food production. These fluctuations in food availability and prices disproportionately affect the most vulnerable households, spending a higher percentage of their income on food and have limited ability to absorb shocks. In Rwanda, the twin crises resulted in a major spike in food prices, with the inflation on locally produced food prices reaching 51% in November 2022[138].

To safeguard against these multifaceted challenges, the country needs to enhance its strategic grain reserve significantly. Such a reserve would enable the nation to source food from the most cost-effective markets, strengthen domestic agricultural value chains, and ensure the smooth functioning of the domestic market. An expanded and well-managed strategic grain reserve is a vital intervention for maintaining national food security and protecting the population against the vagaries of international markets and climate unpredictability.

Key strategic interventions

1 **Expansion of warehouse facilities.** Enhancing the grain reserve will require more warehouse facilities, including the construction of new storage units in key locations and upgrading existing ones to increase capacity. These facilities will be equipped with modern preservation technologies to minimize post-harvest losses and maintain grain quality. Strategic placement will optimize logistics for domestic distribution and import-export activities, strengthening the grain reserve system. Investments will include climate-controlled storage to regulate temperature and humidity, proper ventilation to prevent mold and moisture growth, and airtight seals to protect against pests and contaminants, especially to prevent aflatoxins.

2 **Improve early warning systems and forecasting.** This is critical for reducing the loss of lives and livelihoods associated with natural disasters. Leveraging advancements in remote sensing and economic modelling, the strategy includes implementing a sophisticated early warning system. This system will integrate satellite imagery, weather data, and market trends to predict food price fluctuations and potential shortages. By employing predictive analytics, authorities will gain actionable insights that enable proactive management of the grain reserve, optimizing stock levels in anticipation of market shifts and climatic events.

3 **Strengthen the national gene bank to conserve seed.** Recognising the critical role of resilience in food security, the strategy emphasizes strengthening the existing gene bank with a focus on preserving high-quality, diverse seed varieties. These seeds can be rapidly distributed to farmers in response to prolonged food shortages or crop failures. By safeguarding genetic diversity and ensuring access to climate-resilient seeds, the gene bank will serve as a vital resource for sustaining agricultural production and facilitating recovery during and after crises.

137 Xinshen Diao, Paul Dorosh, James Thurlow, David Spielman, Jenny Smart, Gilberthe Benimana, Serge Mugabo, and Gracie Rosenbach, 2022, Impacts of the Ukraine and Global Crises on Poverty and Food Security, IFPRI Country Brief 5

138 NISR, 2024, Consumer Price Index

Priority Area III

Priority Area III: Strengthening Agri-food systems enablers for effective and efficient delivery

Several enablers are critical for strengthening both the agriculture production side, the side of consumers and value chain actors, and the linkages between actors. The prioritized enablers in PSTA 5 covers innovation and technology transfers, agriculture financing and de-risking, digitalization, planning and coordination. Improving the capacity of these functions underpins transformation of the system through availing critical service to farmers, market actors, and consumers.

Outcome 3.1: Strengthened research and technology transfer for Agri-food systems transformation

This outcome entails numerous programmes to improve support functions. For example, research and innovation facilitate most functions in the system. The research component focuses on linkages between institutions and the feedback with extension to increase farmer uptake. Education, especially agriculture TVET and food science, will be fundamental for agricultural transformation.

Output 3.1.1: Demand-driven research enhanced

Situation

Research and technology transfer are at the core of agriculture transformation while adapting to climate change and mitigating outbreaks of various pests and diseases. The average return to investment in agriculture research is 40-60% globally, and it is higher in developing countries like Rwanda[139]. The PSTA 4 period focused on the development and release of high-yielding, disease and pest-resistant crop varieties and animal breeds, and various technologies to help farmers cope with climate risks[140]. Whilst there was progress in developing new varieties and breeds, and creating fertilizer rate recommendations, challenges remain. The main challenges include limited uptake and commercial use of developed innovations, the need for improved facilities in post-harvest research, gene-bank, ICT facilities, and irrigated test plots[141]. Furthermore, there is a need to develop and maintain a pool of highly skilled researchers in the applied research facilities. Research is dominated by the public sector. For example, in the national plant variety list published in 2021, 136 out of 170 plant varieties are owned by RAB and the remaining 34 are owned by private companies[142]. However, there is an opportunity to leverage networks of national and international research fora, including universities, the private sector, and global research institutions such as CGIAR. The Joint Action Development Forum (JADF) can lead to technology transfer and capacity building and enable evidence-based policy making and national development[143].

Key strategic interventions

1 **Develop high-yielding, nutritious, climate resilient, and disease resistant seeds and breeds.** Priority will be given to developing high-yielding and disease-resistant crop varieties, and genetic enhancements in the animal sector.

139 MINAGRI, PSTA 4

140 MINAGRI, 2022, MTR; MINAGRI 2022/23 Annual Report

141 MINAGRI, 20221 MTR; Stakeholder consultations

142 National Plant variety list 2021

143Yongabo, P., & Göktepe-Hultén, D. (2021). Emergence of an agriculture innovation system in Rwanda: Stakeholders and policies as points of departure. Industry and Higher Education, 35(5), 581-597. https://doi.org/10.1177/0950422221998610

2 **Develop technologies related to soil management, inputs, plant health, and animal health.** Research will concentrate on land health and Integrated Soil Fertility Management, pest and disease measures, and developing climate-smart agricultural practices, and high-intensive technologies such as hydroponics, aeroponics, and others. To further enhance soil health and productivity while reducing greenhouse gas emissions through CO_2 sequestration and mitigating methane emissions, a strategy for compost development will be implemented during the PSTA 5 era. Compost enriches soil organic matter, improves soil structure, and offers a sustainable alternative to synthetic fertilizers, promoting long-term agricultural resilience and productivity while contributing to the fight against global warming and climate change.

3 **Develop post-harvest and mechanisation technologies.** The research will aim to produce post-harvest technologies fitted to the Rwandan context, aimed at farmers accessing labour saving technologies and achieving improved quality and reduced post-harvest losses. Consider specifically labour-saving technologies that address the needs of youth, women, and persons with disabilities.

4 **Carry out conservation of genetic resources.** Resources will be allocated to the collection, characterization, conservation, and archiving of data related to both native and exotic germplasm and genes to avoid genetic loss. The conservation of genetic resources, including microbial species, through ex-situ methods, will be carried out in dedicated infrastructure, such as the National Gene Bank in Rubona, and will be complemented by the establishment of selected in-situ conservation sites. The National Gene Bank will be revamped, expanded, and equipped and its management enhanced.

5 **Enhance research staff capacity.** Research staff will be given PhDs, Masters and Non-degrees short term courses in core and emerging topics. Furthermore, there will be intensified efforts toward staff retention to maintain and grow the capacity for high quality and need-responsive research. Gender equality in the access to these opportunities will be ensured. Research will be promoted through scientific publications, and technologies developed by researchers shall be supported to access intellectual property and contribute to evidence-based policymaking.

6 **Strengthen the network with domestic, regional, and international research institutes.** While maintaining a long-term National research program, regional and international research collaboration will be strengthened. In that way technologies available in the region and across the world will be introduced in Rwanda through patents and licenses to support the sector. Set academy-ministry research platform to review the progress and suggest research projects for joint mobilization of funds.

7 **Promote private sector investment in research (local, regional, and international companies).** The national research institutions will expand collaboration with private actors to access new technologies to allow farmers to access high quality and productive varieties and breeds.

Output 3.1.2: Customised agriculture extension system enhanced

Situation

The extension system is crucial for technology adoption and technology development. Ideally, they work in a dynamic iterative process, translating best agricultural practices and new technologies to farmers, as well as articulating the challenges faced by farmers to the research and policy communities.

The *Twigire Muhinzi* extension model adopted in 2014 marked a shift towards a decentralized farmer-to-farmer extension system, aimed at ensuring comprehensive access to advisory and extension services for all farmers in Rwanda. The model operates through a dual approach, utilizing both Farmer Promoters and Farmer Field Schools to disseminate knowledge and agricultural practices. This has resulted in a substantial increase in the outreach of public advisory services, expanding from one-third of households in 2012 to about two-thirds in 2015. An impact study found that FFS participants saw

their yields grow by close to 38%, while farmers trained by FPs had 11% higher yields[144]. Similarly, livestock producers who participated in Livestock-FFS (L-FFS) saw their yields of milk increase by 75%, from 4.5 to 7.9 Liters per day, and 90% of the participants saw improvements in animal health[145]. The program also successfully introduced climate smart agricultural practices in livestock. Another community-based extension model in animal husbandry practices is the use of Community Animal Health Workers (CAHWs). These are members of the community who receive training in basic animal health care and provide a limited range of basic veterinary services to the members of their community, often in association with or supervised by a graduated veterinarian[146].

The current extension model is recognized for its demand-driven approach, geographic accessibility, and the promotion of technology transfer. It encourages group formation, contributing to social cohesion among farmers and serving as a foundation for various development interventions. Additionally, it utilizes demo plots and experiential learning in Farmer Field Schools, empowering farmers with decision-making skills essential for effective farm management.

Despite its success, the current extension system faces several challenges. Firstly, it is financially unsustainable and relies on public funds and voluntary work from Farmer Promoters. Farmers have limited funds available for FP training let alone a 6-months course in FFS, and the public funds can only reach a fraction of the more than 3.4 million farmers in the country. Secondly, the current system is limited in its scope and capacity for transformational topics beyond basic food commodity production. There is little capacity to cover important topics linking the farmers to opportunities and value chain development, i.e., post-harvest handling, business management, standards compliance, production of commercial crops etc. They are also uniform, one size fits all, and do not consider the various needs of different stakeholders. Finally, the system does not effectively provide a feedback loop from farmers to inform research and curriculum priorities.

As a result, undesirable agricultural practices are still widespread in rural areas, including practices that promote erosion, the absence of crop rotation, excessive use of pesticides, limited utilization of organic manure and lime leading to soil acidification, and the application of a uniform fertilizer recommendation nationwide without considering the unique characteristics of each soil type (including under or over-use of fertilizers).

The GoR has therefore developed the Customized Agriculture Extension System (CAES), to complement the existing system and make the extension system more sustainable responding to the needs of market actors. The implementation of CAES is based on the principle of subsidiarity that stipulates that extension to be effective and responsive to clients must be planned and implemented at the proximity of the beneficiaries where responsibilities between the different levels of the Government and the extension services participants are clearly defined. Although there has been some improvement in the livestock sector paying for CAHWs paid for by farmers and input providers[147], the overall CAES system is yet to be implemented and will need substantially increased participation from stakeholders.

Key strategic interventions

1 **Develop customized extension packages across commodity value chains.** Customized extension packages will be developed in collaboration with different stakeholders, particularly farmers and market actors to respond to their needs. These packages shall be developed for a wider set of value chains. Special consideration is to be given to gender and youth. Based on farmer-to-farmer learning the extension packages need to include indigenous knowledge suited to different agro-ecological conditions

144 Musabyimana, Innocent, Ranganathan, Sankaranarayanan, and Hilda Vasanthakaalam, 2018, Success story of implementing the self-sustaining agricultural extension system in Rwanda, Journal of Agricultural Extension and Rural Development Vol. 10 (9)

145 RDDP, 2022. Impact assessment of L-FFS

146 VSF International (2018). Community-Based Animal Health Workers (CAHWs). Guardians for Quality, localised Animal Health Services in the Global South.

147 Orora wihaze, 2022. Feed The Future Rwanda Orora Wihaze Activity, quarter 3 Performance Report. Kigali, July 29, 2022

of the country and promote sustainable agriculture. The materials shall be tailored to the needs of different demographics, including women, men, youth, persons with disability, and elderly farmers.

2 **Conduct capacity development of extension service providers.** The public sector will develop manuals for capacity building of extension service providers and introduce a certification system for quality assurance. Existing FPs, Master Trainers, FFS and L-FFS facilitators and Community Animal Health Workers (CAHWs) will be enrolled alongside emerging private providers, and private veterinarians and paraprofessionals will be engaged through Veterinary Sanitary Mandate (VSM). Youth in rural communities shall be given opportunities for this training with emphasis on participation from young women.

3 **Provide incentives and platforms for certified extension workers for service delivery.** Both FFS and L-FFS shall be included in the CAES system. They will be allowed to sell services to private market actors who need capacity upgrading. Whereas the workers currently are mostly voluntary, a payment system is to be introduced for those who are certified and consistently provide services in their local communities. Whereas many Twigire Muhinzi FPs will be retained, the CAHW system will be expanded and branded as "Twigire Mworozi". Furthermore, to promote cost efficient digital service delivery models building on previous experience will be leveraged.

4 **Strengthen the partnership between the Government, the private sector, and knowledge Institutions.** The coordination task force will oversee quality assurance of extension materials, fund mobilization, and coordination of extension service providers. The task force will coordinate partnerships with market actors to incentivise extension services provision, as well as partnerships with research and higher learning institutions will be supported to strengthen their outreach programmes. The private sector partners will provide the feedback loop to research institutions and in some cases pay for the research. There will also be extensive involvement with farmers representing both youth, women, men, persons with disabilities, and elderly farmers to ensure that extension packages respond to their needs. The good practices, information, and success stories will be shared through knowledge sharing events such as research open days, agriculture shows and policy dialogues.

5 **Promote market linkages for sustainable financing of agricultural extension.** There is a mutual benefit for off-takers and input providers to establish relationships with producers to ensure access to quality raw materials, and for financial service providers to facilitate transactions between farmers and off-takers. There is also potential for input providers to develop markets with farmers. Local Farm Service Centres should be leveraged to implement these strategies for continuity and support.

6 **Upgrade Monitoring, Evaluation, and Learning.** As the extension programme becomes more pluralistic and implemented by private partners, it is critical for the public sector to enhance its ability to monitor results and ensure learning and knowledge sharing. Public funds must be used where they generate the most impact for farmers and the Agri-food systems in general, and constant learning and adaptation will be necessary to ensure this.

Output 3.1.3: Technical capacity, education, and skills developed

Situation

Sustained agriculture transformation will require a transition towards professional farmers trained extensively in good agricultural practices, animal husbandry, farm management, post-harvest handling etc. Yet over 91% of Rwanda's 3.4 million farmers have only primary education or had no formal education at all[148]. Although the younger generation of farmers are comparatively better educated, still, 41% have only primary school education and 41% had no formal education. Hence, only a small proportion of farmers have received secondary level or extensive TVET education in agriculture practices.

148 NISR, Labour Force Survey 2023

Hence, there is a dire need to increase the level of education amongst farmers, especially in modern and commercial farming practices, as well as graduates in agronomy, veterinarians, and other Agri-food system related studies from higher learning institutions. Just 818 students graduated from higher education in agronomics or veterinary services in 2023[149], while the number of students trained in farming is unknown. For a modernised Agri-food system and transformed rural economies, the education of professional farmers will need to be delivered at a large scale through TVET, secondary schools, and higher learning institutions.

There are ample opportunities to further strengthen agricultural education and professionalisation efforts. Collaborative initiatives between educational institutions, government agencies, and private sector partners can enhance the relevance and effectiveness of agricultural training programmes. By integrating hands-on learning experiences, internships, and apprenticeships into curricula, institutions can better prepare agriculture workers for the challenges in agriculture.

Key strategic interventions

1. **Strengthen the TVET and agriculture provision for professional farming.** The TVET system must be strengthened to substantially change practices in the sector and educate the next generation of farmers and value chain actors at a substantially larger scale. TVET is relevant for both production and post-harvest levels, and climate smart agriculture will be a recurrent theme. Ensure that courses are designed to entice both young women and men to participate.

2. **Strengthen higher-level institutions and especially the STEM field toward capacities needed in the Agri-food systems.** Developing specialized courses in food technology, agriculture, and veterinary practices to incorporate emerging technologies in the training and build a robust food cluster.

3. **Strengthen internship programs.** Establishing collaborative programs with industry stakeholders to facilitate internships, thereby bridging the gap between education and practical industry demands.

4. **Promote entrepreneurship programs.** Launching initiatives that nurture entrepreneurial skills among the youth, aiding them in establishing businesses that can transform the Agri-food systems. Entrepreneurship could be in everything from commercial farming, post-harvest provision, extension services, value addition, or other activities in the Agri-food systems. At least 50% of participants shall be women.

5. **Ensure inclusivity in the educational system.** A focal point remains on ensuring inclusivity, emphasizing programs that actively involve youth, especially young women. Additionally, there is a strong inclination towards promoting sustainable, climate-smart practices through education, ensuring the coming generations are stewards of environmentally friendly agricultural practices.

Outcome 3.2: Strengthened agriculture de-risking for resilience

Despite the Agriculture sector's high contribution to Rwanda's GDP, employment, poverty reduction, and most importantly food and nutrition security, it remains the least-served sector when it comes to financing. The Central bank data on loan disbursement across different economic sectors per types of financial services providers indicate that the share of financing that goes to the agriculture sector stands at six percent and the total loan portfolio to agriculture stands at 3.7% of total formal credit[150].

The commercial banks' agriculture loan portfolio stands at 5% of the total loans, Microfinance institutions (other than Umurenge SACCOs) at 7% and Umurenge-based SACCOs at 26%. However, in terms of importance, commercial banks contributed up to 80%, Microfinance institutions other than SACCOs 8% and Umurenge SACCOs 12%.

149 NISR, Statistical Yearbook 2023

150 BNR

Output 3.2.1: Access to agriculture finance increased

Situation

In 2023, only 6% of commercial credit was allocated to agriculture, despite the sector contributing about 25% of GDP and employing over two-thirds of the population. While this marks an improvement from the 1-2% before the PSTA 4 period, it still falls short of the NST-1 target of 10%. Challenges stem from both the demand side (subsistence farming, production risks, market risks, lack of access to credit, outdated agronomic practices, etc.) and the supply side (high transaction costs, lack of suitable financial products, and limited capacity of financial institutions).

A major barrier is the lack of data on farmers, which hinders access to financing. In sectors like tea and coffee, where extensive profiling has been conducted, this has notably eased access to finance.

The public sector has played a significant role in funding agriculture with investments in irrigation, terracing, and cold-chain facilities, and this will continue in PSTA 5, with a greater focus on maximizing investment impact by strengthening the implementers.

Key strategic interventions

1. **Establish the agriculture de-risking facility.** Aimed at bridging the gap between farmers and financial markets by minimizing finance market risks and stimulating both demand and supply sides. This includes providing credit guarantees, technical assistance, and grants to support infrastructure development, market linkages and value chain advancements, focusing on systemic impact projects that ensure gender inclusion and youth opportunities.

2. **Incentivize the development of tailored agri-finance products.** Encourage agricultural finance innovation through evidence-based approaches and partnerships, developing new financial models to address market failures and leveraging patient capital and blended finance. Special focus will be on products for smallholder farmers, women, and persons with disabilities, as they have lower access to finance than other demographics.[151].

3. **Strengthen governance and coordination for agri-finance reforms.** Improve the coordination among agriculture finance stakeholders, establish working groups, and roll out infrastructure improvements to facilitate access to financial services in rural areas, ensuring an enabling environment for agriculture finance.

4. **Build farmer profiles and strengthen digital payment systems.** Accelerate the creation of farmer registries in priority value chains to enhance finance access, implement interoperable payment systems to provide a comprehensive view of smallholder financial transactions and develop alternative collateral options.

5. **Create awareness and strengthen financial services education.** Launch campaigns to increase awareness of financial services, addressing cultural norms affecting gender-based access, and enhancing the capacity of financial service providers to develop seasonally adjusted products.

Output 3.2.2: Agriculture Insurance scheme strengthened

Situation

Rwandan agriculture is largely rain-fed, making it vulnerable to climate-related risks, especially droughts. Climate change has heightened the risks of droughts, floods, pests, and diseases that affect crops and livestock. Parts of Rwanda have seen unusual climate patterns, such as rainfall variability

151 NISR, Finscope 2021

and extreme events, including heavy rains in the North and West and droughts in the East and South of the country.

In response, the government launched the National Agriculture Insurance Scheme (NAIS) in 2019 under the initiative "Tekana Urishingiwe Muhinzi Mworozi." This program aims to reduce agricultural risks through insurance, offering indemnity-based livestock products and area-yield index insurance for crops. The government subsidizes 40% of premiums, while farmers cover 60%. The scheme currently covers eight crops and three types of livestock, with aquaculture insurance under development. Since its launch, the NAIS has significantly mitigated risks from weather and disease. In four years, the scheme has facilitated over RWF 2 billion in agricultural loans, using insurance as collateral. Insurance companies have collected over RWF 4 billion in premiums, and RWF 2.5 billion has been paid out in compensation to farmers for losses. These successes were largely enabled by nearly RWF 1.7 billion in government subsidies.

However, uptake of the insurance scheme has been lower than expected. Barriers include high promotional costs, limited market knowledge, insurer reluctance, and issues with contract fulfilment and payouts. The insurance mainly covers input costs but does not address the opportunity cost of lost harvests or income. Farmers are compensated for direct damage but not for the potential income lost from selling their harvest, making the insurance less attractive.

A key challenge is the lack of detailed data on farmers, limiting access to financial services. However, in sectors like tea and coffee, where farmers have been profiled through detailed data collection, access to finance has improved. Profiling has helped farmers in these sectors secure loans and financial products.

The public sector has been crucial in financing agricultural infrastructure. During PSTA-2, 3, and 4, significant investments were made in irrigation, terracing, cold-chain facilities, and more. These investments, alongside grants to private sector implementers, have contributed to the sector's growth. For PSTA 5, there is a focus on ensuring strong implementers to maximize the impact of these investments. Despite challenges, Rwanda's agriculture sector has grown, with agro-export value rising and major projects improving irrigation, commercialization, and access to finance and insurance. Moving forward, ensuring the efficiency of these initiatives and a comprehensive strategy to strengthen agricultural stability, productivity, and sustainability is essential.

Key strategic interventions

1 **Stimulate demand for agri-insurance.** Enhancing uptake through clear guidelines, mobilization efforts, enforcement, and continued subsidies. Make agriculture insurance compulsory for all large-scale crops and livestock farmers to create a critical mass and allow for risk spreading. In return, the Government will subsidize output coverage products and improve accountability and transparency, ensuring farmers receive their contracts promptly after premium payments, and monitoring the fulfilment of these contracts by insurance companies to build trust with farmers. Currently access rates for women and youth are respectively 0.7% and 0.8% versus 1.1% for men and non-youth[152]. Therefore, consideration will be given to meeting the specific needs of these groups.

2 **Stimulate the development of more attractive and profit-oriented agriculture insurance products.** The government subsidy will shift towards output-based insurance products. Moreover, to increase the uptake of insurance the government will improve access to data and farmer profiles for more efficient delivery of insurance products.

Outcome 3.3: Digitized Agri-food Systems

Over the past few decades, the world has seen the emergence of new digital technologies with transformational potential at all levels in the Agri-food systems. For example, farm operations can be greatly improved with modern technologies such as precision farming, smart irrigation, smart livestock monitoring for optimized feed and water management, digital extension services, and many others. At the level of value chains, digital payment solutions can improve access to markets and finance, as

152 NISR, Agriculture Household Survey 2020

digital traceability systems can enhance supply chain transparency to reduce food losses and provide reliable information for consumers, and other stakeholders. Finally, at the planning and governance level, digital technologies such as remote sensing and artificial intelligence can automate data collection and simplify workflows for rapid decision-making.

Rwanda has established a robust institutional framework to support digitization of agriculture and harness the full potential of these technologies clustered under the name "4th Industrial Revolution (4IR)" [153]. The ICT4RAG (ICT for Rwanda Agriculture- 2016-2020 and the National Digital Agriculture Strategy-2023-2030 (NDAS) set the digital agenda for agriculture coupled with key national policies such as the revised National Broadband Policy (2022) prioritizes 4G/5G access, critical for data-driven solutions. The Responsible National AI policy promotes ethical Artificial Intelligence (AI) development in agriculture, backed by ongoing use cases. The Startups Act and Rwanda Innovation Strategy (2023) incentivize and support Agritech growth. Finally, the creation of digitalization divisions within key Ministries has proved a game-changer for accelerating digital transformation and creating practical digital solutions. Nevertheless, Rwanda's agriculture grapples with digital hurdles which are to be addressed in the PSTA 5 period. Challenges include limited rural internet, low farmer literacy rates, inaccurate data, affordability issues, limited institutional capacity, and fragmented tools. The following subsections define an agenda for digitising the agriculture sector at farm level, in value chains, and in institutions. The agenda here established how the government can facilitate the private sector and civil society to drive the transformation through the adequate frameworks to expand rural connectivity, bridge the digital divide, enhance data quality, promote financial inclusion, standardise tools, build sustainable solutions, and create awareness through education.

Output 3.3.1: Affordable digital technologies developed

Situation

Rwanda has made significant progress in digital infrastructure with rising internet and mobile phone use (30.5% internet penetration and 11.7 million mobile phone users)[154]. Especially recent surges in the use of mobile money and smartphone usage have created opportunities across the sector to leverage data and traceability to provide products and services.

However, a digital divide persists between urban and rural areas (79.6% mobile phone ownership in Kigali vs. 35% in the Southern Province)[155], which is a barrier to fully unlock the potential of digitalization in propelling agricultural development. Despite advancements in digital agriculture initiatives like the Agriculture Monitoring Information System (AMIS), E-soko, and Irembo, there are still challenges like data limitations, affordability, and unequal access due to disparities across location, age groups, and gender. The benefits of digitalization will only be fully reaped when a critical mass of farmers have access to digital applications.

Key strategic interventions

1. **Prioritize Device access and connectivity.** Expand access to affordable digital devices for farmers and stakeholders through subsidies, partnerships, and tax incentives[156] and Increase advocacy for investment in expanding reliable internet access across rural areas.

2. **Reduce Costs for Digital Adoption.** Partner with private companies and others to subsidize access and transaction fees for essential agricultural services, driving wider use[157].

3. **Establish a Digital Public Infrastructure for Agriculture.** Build the Agricultural Management

153 DE4A (Digital Economy for Africa Initiative). Digital Transformation Strategy for Africa [Internet]. 2023 [cited 2023 Dec 12]. Available from: https://www.worldbank.org/en/programs/all-africa-digital-transformation

154 Simon Kemp, 2023, Digital Insights for Rwanda.

155168 NISR. Statistical Yearbook 2022. 2022. Available from: http://www.statistics.gov.rw

156 AFDB. Africa Digital Transformation Action Plan (2022-2026).

157 GSMA. The Mobile Economy Sub-Saharan Africa 2023.

Information System (AMIS) as a comprehensive registry for farmers, farms, crops, and livestock. This foundation will empower innovation and unlock data-driven decision-making through analytics. Integrate AMIS with Esoko, mobile payments, and e-commerce platforms to connect farmers directly to markets, improve transparency, and enhance food security.

Output 3.3.2: Data governance enhanced

Situation

Rwanda's data infrastructure offers potential for informed agricultural decisions, but challenges persist[158]. Data collection suffers due to a lack of incentives[159], resource limitations at the local level[160], and slow traditional methods. Investing in capacity building, incentives, and technological solutions can overcome these hurdles, empowering data teams and unlocking actionable insights for policy and investment.

Key strategic interventions

1. **Implement a robust data strategy and governance framework.** This framework will prioritize data privacy, compliance, and quality, while enabling data sharing across stakeholders. National and local data stewards will oversee collection, quality, and capacity building in data technologies.

2. **Build a scalable data network with incentives.** Motivate data collection with performance-based rewards, leverage private and youth partnerships to expand outreach, guaranteeing data quality through clear processed and robust data governance[161].

3. **Modernize data collection with technology.** Utilize drones, satellite imagery, IoT, and crowdsourcing to gather data faster and cheaper[162]. Invest in robust data storage, analysis, and AI tools to unlock big data's potential for nationwide agricultural insights to inform policy making[163].

Output 3.3.3: Digital innovation in agriculture value chains promoted

Situation

Rwanda boasts a thriving ecosystem for digital innovation with plenty of start-up initiatives and several start-up incubators. However, there is a hurdle to reach young innovators toward agri-tech resources and initiatives are concentrated in cities. Moreover, low agricultural commercialization limits the financial viability of many agri-tech solutions, and early-stage agri-tech startups struggle to reach the market. However, opportunities exist. Development of Infrastructure coupled with decentralization of resources, and mentorship programs, can address rural access gaps.

158 FAO. The State of Food and Agriculture 2021: Digitalization and Big Data in Agriculture. The State of Food and Agriculture 2021. FAO; 2021.
159 World Bank. Data Driven Agriculture Toolkit. 2023.
160 FAO. The State of Food and Agriculture 2021: Digitalization and Big Data in Agriculture. The State of Food and Agriculture 2021. FAO; 2021.
161 World Bank. Data Driven Agriculture Toolkit. 2023.
162 FAO. The State of Food and Agriculture 2021: Digitalization and Big Data in Agriculture. The State of Food and Agriculture 2021. FAO; 2021.
163 World Bank. Data Driven Agriculture Toolkit. 2023.

Key strategic interventions

1. **Launch Agritech innovation pipeline.** Establish a dedicated program to onboard and nurture Agritech talent. This pipeline will leverage existing initiatives, GoR collaborations (MINAGRI-MINICT), and innovation hubs to ensure quality assurance. Verified innovations will be promoted to farmers, boosting confidence and adoption.

2. **Cultivate Agritech Champions.** Expand incubation programs, mentorship, and hackathons to attract and empower young innovators. Delivering tailored training for Agritech entrepreneurs will enable success at all development stages.

3. **Unlock AMIS data for Innovation.** Promoting the AMIS API for local and international innovators/researchers will empower them to create data-driven Agritech solutions for farmers.

Output 3.3.4: Digital competencies developed

Situation

Rapid digitalization in Rwandan agriculture offers great potential, but challenges remain. Smallholder farmers, especially women and the elderly, face barriers in digital literacy and device access. For example, women are 21% less likely than men to own a mobile device. While 77% of young Rwandans (aged 15-24) use the internet, only 27% of those aged 55-64 do. Moreover, there's a widening gap between the required and existing government capacity to leverage emerging technologies for agricultural transformation. This highlights the need for capacity building within government ranks to adopt digital tools effectively.

Ensuring access to technology and digital literacy for smallholder farmers, particularly women and the elderly, is crucial for maximizing the potential of digital tools. The government must bridge these gaps to make agriculture more inclusive and sustainable, fostering growth through innovation and capacity development.

Key strategic interventions

1. **Strengthen delivery of digital literacy through age-appropriate programs and innovations.** Leverage existing networks like digital ambassadors, farmer promoters, village elders with smartphones, etc. and partner with private sector initiatives to develop context-specific, accessible digital literacy modules. Leveraging innovations to strengthen sustainable delivery of digital literacy and advisories like solar-powered tablets and other private sector advisory models (e.g., kuza.one) will contribute to energy-efficient solutions.

2. **Strengthen Regional and Community Agritech ICT Centres.** Partnering with existing rural ICT centres to equip them with computers, internet, and Agri-digital officers, will empower farmers with information access nationwide. Explore alternative solutions like affordable tablets or public access points to technology such as digital villages.

3. **Develop structured programmes for sustained capacity development (leadership and emerging technologies, other).** Equip government staff with digital skills to identify, prioritize, and adopt relevant emerging technologies skills in each period such as AI, satellites, machine learning and blockchain.

Output 3.3.5: Sustainable business models for digital systems and platforms developed

Situation

MINAGRI has launched a robust suite of digital agriculture platforms with over 10 operational or near completion platforms. Examples include the Management Information System (MIS), Esoko, National Agriculture Insurance Scheme (NAIS), National Strategic Reserve System (NSGR), Smart Kungahara (SKS), Smart Nkunganire (SNS), the livestock harmonization project, FaMIS, the Seed value chain digitization system, the Smart Agric System-Satellite Enabled system (MVP stage), the AI-enabled voice chatbot for Agri-advisory (implementation), inspection and certification system, and Rwanda Soil Information Service (RWASIS).

However, the long-term sustainability of these systems presents challenges, particularly regarding funding, data updates, and technical expertise for ongoing maintenance[164]. The current reliance on pre-qualified service providers for system development and handover often incurs significant costs and requires technical capacity for maintenance and updates. Development partner contributions and technical assistance can help offset initial costs, but ongoing maintenance, data collection, and upgrades require innovative solutions. Additionally, timely data collection is crucial for many systems, particularly those using machine learning or requiring output validation, further complicating sustainability. A compounding factor is the widening gap between the required and existing government capacity to leverage emerging technologies for transformation. Although the government has invested significantly in digital capacity during the PSTA 4 period, rapid advancement in available technologies poses challenges in keeping pace and unlocking the full potential.

While public investment plays a crucial role in enabling digital agriculture transformation,[165] recognizing the limitations of relying solely on government funding is vital. To achieve sustainable growth, diversifying financing models through strategic partnerships, private sector engagement, and innovative approaches is crucial[166].

Key strategic interventions

1 **Diversify funding for digital agri-tech.** Secure long-term financial viability by exploring hybrid funding models (public-private partnerships, user fees) and innovative data monetization (anonymized data for research/services). This, combined with open-source solutions and subsidized technologies, will ensure the sustainability of digital agriculture platforms.

2 **Mobilise resources for digital agriculture growth.** Develop a comprehensive resource mobilization plan which maps funding sources (grants, blended finance) to stakeholder needs and gaps. Leverage blended finance tools and incentivize private sector participation (co-financing, risk-sharing) to attract investment and accelerate digital agriculture growth. Additionally, establish dedicated funds to support local innovators and early-stage solutions.

164 World Bank. Data Driven Agriculture Toolkit. 2023.

165 FAO. The State of Food and Agriculture 2021: Digitalization and Big Data in Agriculture. The State of Food and Agriculture 2021. FAO; 2021.

166 World Bank. Data Driven Agriculture Toolkit. 2023.

Output 3.3.6: Digitalization networking strengthened

Situation

While establishing a digital office within MINAGRI was a positive step, challenges remain in achieving effective coordination across the sector. Collaboration between the office, other directorates, and external Agri-food systems stakeholders is critical, yet remains limited. This fragmentation leads to missed opportunities and duplicated efforts[167]. Additionally, digital delivery is often overlooked in monitoring and evaluation frameworks. Early and ongoing collaboration with the digital office throughout project lifecycles is essential to optimize efficiency, leverage expertise, and achieve successful digital agriculture integration.

Key strategic interventions

1 **Establish a cross-cutting digital agriculture working group.** Led by the PS office and comprising representatives from across the Agri-food systems stakeholders (MINAGRI, RAB, NAEB, private sector, farmer organizations, development partners) and building on the National Digital Agriculture Strategy (NDAS), this group will drive coordinated planning, prioritization, and implementation of digital agriculture strategies. It will oversee information sharing and ensure the strategy's alignment with evolving sector priorities, facilitating smooth execution.

2 **Establish a national digital agriculture task force.** The task force will translate the strategy into concrete action with a core focus on driving implementation by leading data governance efforts, exploring resource mobilization options, and fostering collaboration across the entire Agri-food systems.

Outcome 3.4: Strengthened Agri-food systems planning and coordination

The Government of Rwanda (GoR) will continue the path toward becoming a market facilitator rather than a market actor. This outcome underscores the importance of institutional capacity and synergized coordination to deliver results in Rwanda's Agri-food systems with a strengthened focus in MINAGRI on evidence-based policy, programme designs, resource mobilization, regulations, Monitoring, Evaluation, and Learning (MEL), and knowledge management. Meanwhile, implementing agencies will focus on supporting farmers, market actors, and consumers to thrive in the Agri-food systems.

To deliver on this agenda, there is a need for strengthening institutional capacity and the enabling environment to mobilise the necessary resources and capacities from various actors. Therefore Agri-food systems planning, coordination, improved policies and regulations, enhanced institutional capacity are key areas of focus under this outcome.

Output 3.4.1: Capacity for planning and knowledge management enhanced

Situation

The transformational food systems agenda outlined in this strategy entails introducing programmes that involve a wide range of stakeholders. Initiatives such as the de-risking facility, CAES, and the AgriHubs are new approaches and involve collaboration with Agri-food systems stakeholders, and to realize the full impact potential and mitigating potential risks of such programs requires strong designs from the onset and adapted approaches during implementation. Furthermore, PSTA 5 requires substantial resource mobilisation from a wide range of stakeholders. Currently, Rwanda allocates 7.5% of its public expenditure to agriculture, falling short of the 10% target in the Malabo declaration[168].

This indicates a need to increase the capacity for mobilising public, private, and civil society resources, as well as increasing efficiency and effectiveness. Therefore, the new agenda requires increased

167 World Bank. Data Driven Agriculture Toolkit. 2023.

168 4th Biennial CAADP Report, 2023. Page 114.

capacity in MINAGRI and its agencies for planning and adaptive management of programmes with catalytic impact across the Agri-food systems.

Key strategic interventions

1 **Strengthen public sector capacity to design and oversee the implementation of impactful programs.** PSTA 5 will intensify the programmatic approach to deliver on the strategic agenda. This requires a project tasked with designing impactful programmes and mobilising the required resources. The project will design programmes and public private partnerships with feasibility studies, cost-benefit assessments, and environmental and social impact assessments, and accountability. This will be achieved through the existing public sector staff, which will be complemented by recruitment of new staff where needed.

2 **Strengthen MEL and knowledge management capacity for adaptive management.** The strategy and programmes will have a robust yet flexible MEL framework at several levels. Firstly, the strategy and key programmes require base-lines, mid-term reviews, and end-lines at the impact and outcome levels to guide broad, strategic priorities. Secondly, there will be ongoing reports capturing progress on output indicators as well as qualitative assessments capturing lessons learned during implementation and guiding the way forward. Thirdly, there will be ongoing reports on real-time data tracking and analysis in key areas such as food prices, disaster events, and others. Fourthly, ad-hoc research projects will be commissioned in partnership with research institutions, to provide strategic guidance for policy and strategy formulation. Finally, MINAGRI will ensure knowledge sharing through events and dissemination across programmes.

3 **Establish a public sector capacity building programme to underpin the transformation.** This programme aims to endow them with the requisite skills for effective engagement and facilitation considering the new strategy, including navigating public-private interfaces, and contributing to systemic agricultural improvements. The programme will include various models of capacity building such as formal degrees in relevant fields, non-degrees training, on-the-job capacity building, and coaching.

4 **Establish PSTA 5 coordination program (to be called Programme 5).** The agriculture sector is required to have a dedicated basket fund for coordination and capacity building of the staff and key players, supporting the transformational agenda of PSTA 5. The fund will help to secure coordination operations such as office expenses, training costs, convenings, post-project management, and other indirect costs. The fund will replace Programme 4 which was a support fund for PSTA 4 implementation and is therefore required to be upgraded to this PSTA edition. This basket will be directly linked to the existing projects and flagship programs to be developed under the PSTA 5 and its funding will come from partners as direct contribution or indirect costs (overheads) on the flagship programs and depending on the flexibility of the partners. This will be clarified and implemented through financial and technical agreements that will be signed between heads of institutions in the agricultural sector and partners for Agri-food systems transformation.

Output 3.4.2: Agri-food systems coordination and value chains developed

Situation

The Agri-food systems objective requires collaboration between sectors and joint planning. Recognizing the interconnectedness of sectors MINAGRI will foster collaboration with other sectors and partners critical to achieving PSTA 5 objectives. The agriculture sector working group will need to be redesigned to reflect the food systems approach, and there will be increased coordination with other institutions that are critical in the Agri-food systems, such as MINECOFIN, MINAFFET, MINICT, MINALOC, MOH, MOE, MINEDUC, MINICOM, RDB, and MININFRA etc. Moreover, in response to gaps identified in the MTR, there is a need for intensified efforts toward public private dialogue as well as strengthening coordination with civil society, research institutions, and development partners in critical areas such as research and extension services provision and other, with a common agenda to strengthen value chains.

Key strategic interventions

1. **Establish cross-institutional platforms to strengthen Agri-food systems coordination.** A food systems secretariat will be established to coordinate interventions and joint planning across sectors. Secondly, the CAES secretariat will be established to implement the CAES agenda linking research outputs to extension providers, value chain actors, and funders (see Outcome 3.1.2)

2. **Prepare packaged business plans for value chain development.** De-risking investment through business models that assess the profitability of various value chains. This will inform the government, farmers, and investors about business viability. The plans will consider youth and create access for women.

3. **Revitalize and establish new National Agriculture VCPs to bolster private sector engagement.** It will serve as a nexus for collaborative development across the agriculture value chains. It will promote the development of investment plans and defined contributions from both the public and private sectors.

4. **Establish transparent governance structures for PPDs.** Provide PPD guidelines to foster stakeholder engagement by respecting stakeholders' representation (youth and women), agenda-setting for efficient PPDs meetings, and follow-up mechanisms for meeting resolutions.

5. **Establish and strengthen linkages with regional value chains.** Diversify export opportunities into broader markets through MINAFFET & PSF (example: access the global marketplace for Rwandan products).

Output 3.4.3: Policy and regulatory reform for an enabling environment reviewed

Situation

The Government of Rwanda (GoR) remains steadfast in its commitment to foster a conducive environment for the transformation of agriculture and enhancing resilient Agri-food systems. The PSTA 4 Mid-Term Review (MTR) provides detailed insights into Rwanda's progress in creating an enabling environment for agricultural transformation as outlined in the PSTA 4 framework. Specific achievements include significant advancements in climate resilience through the development of terraces and irrigation systems, the establishment of local seed companies to reduce seed import dependency, and improvements in food security and nutrition. For instance, the area under irrigation increased by 21.3% during the 2018-2021 period, and 53 local seed companies were initiated, contributing to the availability of locally produced improved seeds[169]188. Such a transformational agenda of the Rwandan Agri-food systems, including the agriculture sector, will necessitate a reconfiguration of institutional structures to support these enhanced roles efficiently and effectively.

During PSTA 4, MINAGRI has worked synergistically with stakeholders to support investment in the sector (e.g. access to subsidies and access to finance) and facilitate access to services (e.g. access to land tenure for agriculture endeavour). However, in the rapidly evolving Agri-food system space, regulatory frameworks often struggle to keep pace with innovation adoption, market trends, and the changing needs of farmers, consumers, and businesses. This can lead to outdated, excessive, or inefficient regulations that hinder growth, innovation, and sustainability in the sector. Hence, the ministry has been partnering with different stakeholders to firm up its system. A continuous regulatory reform review is essential to identify regulatory bottlenecks, to align policies with current best practices, and new development, and to ensure that the legal environment reinforces rather than impedes agricultural development, and that policies and regulations are informed by evidence.

169188 Mid-Term Review PSTA- 4, pages 31-32

Key strategic interventions

1 **Institutionalize a structured review Process for regulatory frameworks.** MINAGRI will regularly review and monitor the performance of its regulatory frameworks and take necessary steps and actions to deliver in line with Agri-food systems such as enabling the Business of Agriculture framework. In addition, considering the situation, the Ministry could identify new policies, laws, and regulations to bring on board, considering regulatory synergies and trade-offs.

2 **Build an alliance with Agri-food Systems stakeholders.** To ensure evidence-based policies, the government will regularly consult research institutions and other stakeholders. Also, the profile of stakeholders will be widened to include Agri-food systems actors operating outside the agriculture sector during consultations. Establish new sector working group platforms geared toward Agri-food systems approaches.

Output 3.4.4: Institutional reforms for effective implementation enhanced

Situation

Modern agriculture faces a variety of complex and evolving challenges, including climate change, market volatility, and the need for sustainable practices. These issues demand robust, agile institutional frameworks that can support transformative efforts across the agriculture sector. The agricultural landscape is further complicated by cross-cutting issues that span multiple sectors, such as water management, land use, rural development, and climate resilience. These challenges cannot be addressed within a narrow, sectoral approach but require integrated efforts across various areas, which is why a shift towards thinking in terms of *Agri-food systems* is necessary.

Unfortunately, many existing institutional frameworks are outdated and fail to meet the demands of today's dynamic Agri-food systems. Current structures often do not effectively integrate new technologies, data-driven decision-making, and innovative management practices. As a result, they are poorly equipped to respond to emerging trends, embrace innovation, and promote sustainable growth or resilience in the sector. This misalignment undermines the sector's capacity to adapt, scale, and meet the demands of modern agriculture

Key strategic interventions

1 **Conduct institutional review.** As the PSTA 5 moves to implementation, an institutional review will be conducted to assess key institutional capacities and weaknesses against the new priorities in PSTA 5. Specific focus will be given with respect to capacities like resource mobilisation, programme design, MEL and knowledge management, digitalization, value chain development, climate resilience, legal and regulatory capacity, nutrition, and others.

2 **Conduct institutional arrangements to perform in the Agri-food Systems space.** Based on the institutional and capacities gap analysis as well as responding to the pressing need and mandate of the Agri-food systems necessary institutional adjustments and arrangements will be carried out.

3 **Incorporate technology and innovation into modernization efforts.** Digitalization of the Agri-food systems will play a significant role through the introduction of interactive dashboards for efficient executive decision-making and performance tracking as well as onboarding of Data analysts to provide deeper analysis of agriculture data, especially for food security projection and agriculture transformation planning.

Financing and Economic Appraisal

5. Financing and economic appraisal

5.1 Costing methodology

The costing of the strategy was done after defining targets for activities and outputs. Unit costs were obtained from reviews of existing and previous programmes and literature, and through workshops with relevant experts in MINAGRI and relevant agencies. The cost modelling was done with COSTAB software.

The main assumptions include a national inflation rate of 4.2% per annum, an international inflation rate of 3% per annum, and an exchange rate of 1294 RWF/USD. Price and implementation contingencies were applied to certain expenditure categories. Unit costs are provided inclusive of all taxes, including import duties, value-added tax (18% VAT), and other direct and indirect taxes. VAT applies to most expenditure categories except for training and grants. Local purchases mainly consist of training and study services, developments, and technical assistance. Price increase provisions are based on the 4.2% annual inflation rate as of March 2024, though it is noted that this consumer price index may not perfectly reflect the specific purchases for the strategy.

5.2 Financing requirements

Table 2 on the next page provides a comprehensive overview of the financing requirements to fully fund the strategy and generate the desired impact. The total cost is estimated at 6,406.5 billion RWF, with 77.6% (4,974.4 billion RWF) in local currency and 23.8% (1,665.3 billion RWF) in foreign currency.

The share of foreign exchange costs is mainly explained by specific needs related to international technical assistance, equipment, materials necessary for rehabilitation or infrastructure installation work and other expenses related to operations, study trips, training abroad.

As presented in Table 2, Priority Area I: Modernization of Agriculture and Animal Resources Production for resilient food systems takes the lion’s share of the budget (58.6% of the total budget), whereas Priority Area II: Inclusive markets and post-harvest management for sustainable Agri-food systems takes 17.5%; and Priority Area III: Strengthening Food Systems Enablers for Effective and Efficient delivery takes 23.9%. Additionally, 11.3% of the total budget is allocated for contingencies, including both physical (0.8%) and price (10.5%) contingencies, to ensure flexibility in adapting to unforeseen circumstances and price fluctuations.

The investment is divided between public and private sector contributions, with the public sector investing RWF 3,600.0 billion (56.2%) and the private sector expected to contribute RWF 2,806.5 billion (43.8%). The budget demonstrates a gradual increase in annual investment, starting at 1,071.6 billion RWF in 2024/25 and reaching 1,435.9 billion RWF by 2028/29. This escalation reflects the ambitious nature of the strategy and the increasing capacity for implementation over time.

A key feature of this financial plan is the consistent and substantial private sector leveraging, which remains steady at 40-45% each year. This underscores the strategy's emphasis on public-private partnerships and highlights the government's commitment to creating an enabling environment that attracts and sustains private investment in the Agri-food system. The balanced approach between public and private funding is designed to ensure the sustainability and effectiveness of the strategy's implementation, aligning with Rwanda's vision for a market-driven agricultural transformation.

Table 2: Financing requirements by component

	Domestic Currency (Billion)	Share of total	Foreign currency (US $ Million)
Total strategy costs	**6,406.5**	**100%**	**4,950.8**
1. Modernization of Agriculture and Animal Resources Production for Climate Resilient Agri-food Systems	**3,753.51**	**58.6%**	**2,900.7**
1.1. Modernized Crop Production and Productivity	2,430.82	37.9%	1,878.50
1. 2. Modernized Animal Resources Production and Productivity	1,322.69	20.6%	1,022.20
2. Inclusive markets and post-harvest management for sustainable Agri-food Systems	**1,121.17**	**17.5%**	**866.4**
2.1. Boosted Agriculture Exports	144.45	2.3%	111.6
2.2. Strengthened market linkages and post-harvest infrastructures	234.84	3.6%	181.5
2.3. Improved Food Security and Nutrition	741.88	11.6%	573.3
3. Strengthening Agri-food Systems enablers for effective and efficient delivery	**1,531.78**	**23.9%**	**1,183.7**
3.1. Strengthened research and technology transfer for agri-food systems transformation	860.64	13.5%	665.1
3.2. Strengthened agriculture de-risking for resilience	405.59	6.3%	313.4
3.3. Digitized Agri-food Systems	217.14	3.4%	167.8
3.4. Strengthened Agri-food Systems planning and coordination	48.41	0.8%	37.4

5.3 Macro-economic Impact

The analysis presented in the following figures is underpinned by the Rural Investment and Policy Analysis (RIAPA) model, which is a computable general equilibrium (CGE) model developed by the International Food Policy Research Institute (IFPRI).[170] This model has been specifically calibrated to Rwanda's economic context using an updated 2022 Social Accounting Matrix (SAM), ensuring its relevance and accuracy. The RIAPA model allows for a comprehensive assessment of PSTA 5's potential impacts across various sectors of the Rwandan economy, capturing both direct and indirect effects of the proposed interventions.

The analysis considered four scenarios for public spending:

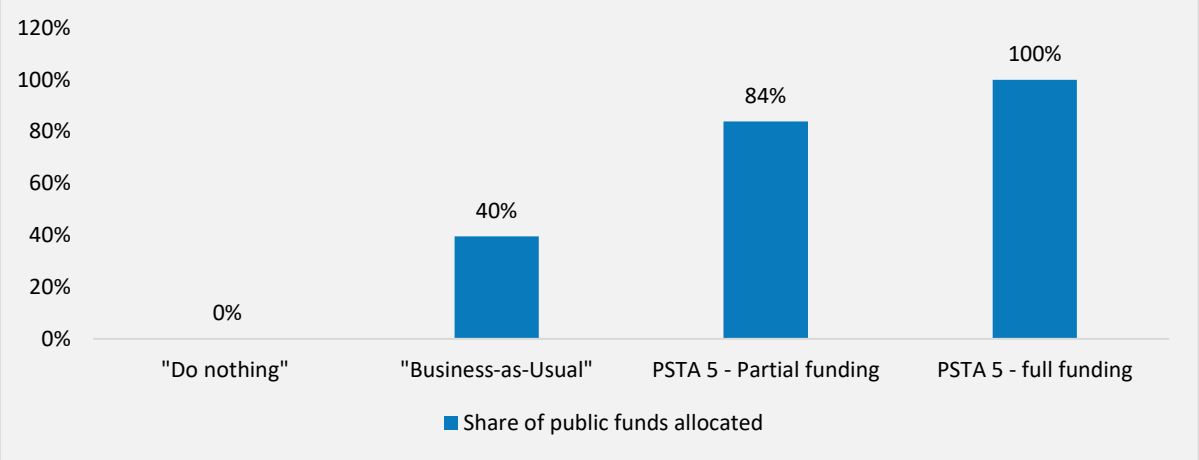
1. **PSTA 5 - Full funding scenario.** This scenario assumes full implementation of PSTA 5 with complete financial backing[171].

[170] It should be noted that a CGE baseline year can usually not be calibrated to match observed data in the base year. The model approximates reality rather than replicating it.

[171] It should be noted that by "fully funded" we refer to investments that can be modelled in the current RIAPA model framework.

2. **PSTA 5 - Partial funding scenario.** This represents a situation where PSTA 5 is implemented but with limited financial resources – 84% of the planned public investment to be implemented.
3. **"Business-as-Usual" scenario.** This scenario assumes a continuation of current policies and public investment levels growing by the same level annually as under PSTA 4 (11% per year on average).
4. **"Do nothing" scenario.** This represents a baseline where no public interventions or investments are made in the Agri-food systems.

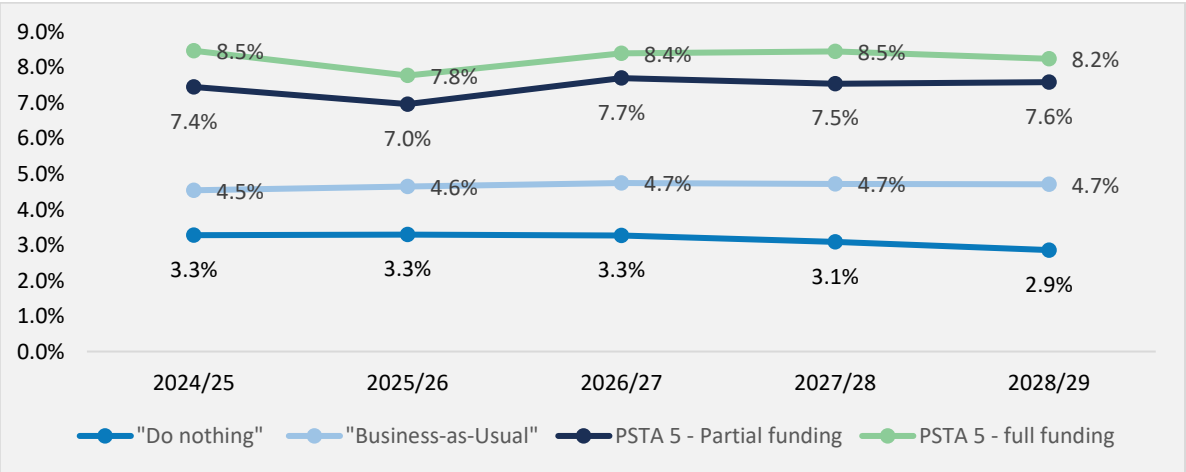
Figure 1: Share of the planned public funds raised for PSTA 5



The following sections present RIAPA model projections of key macro-economic variables under the four different public spending scenarios.

As presented in Figure 2, the divergence in agricultural GDP growth across scenarios is striking. The "Do nothing" scenario shows minimal growth, hovering around 3% annually with a declining trend. The "Business-as-Usual" scenario indicates slightly higher growth at 4.7% on average. However, even with partial funding, PSTA 5 is projected to significantly boost growth to 7.5% annually on average. The full funding scenario demonstrates the transformative potential of PSTA 5, with growth rates reaching 8.2% by 2028/29. Compared to the baseline, agriculture GDP will be 4.1 times larger by the end of the strategy under the fully funded scenario, versus 2.35 times larger under the business-as-usual scenario.

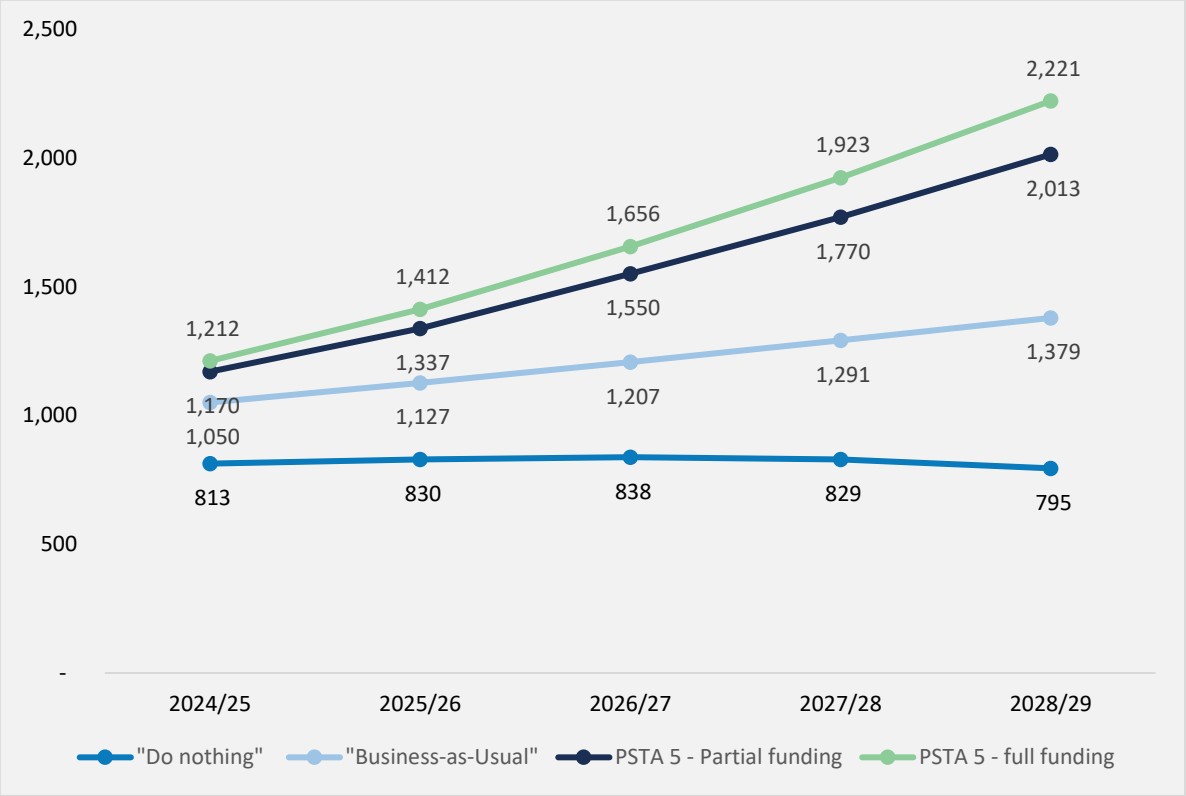
Figure 3: Annual Agriculture GDP growth



Export projections vary significantly across scenarios (see Figure 4 below). The "Do nothing" scenario shows stagnant export values, while "Business-as-Usual" indicates modest growth.

PSTA 5, even with partial funding, is expected to substantially increase exports from USD 875 million in 2023 to USD 2 billion by 2028/29. Full funding could push this figure to over USD 2.2 bn, highlighting the strategy's potential to transform Rwanda's agricultural export sector.

Figure 4: Annual Exports Projection (USD million)

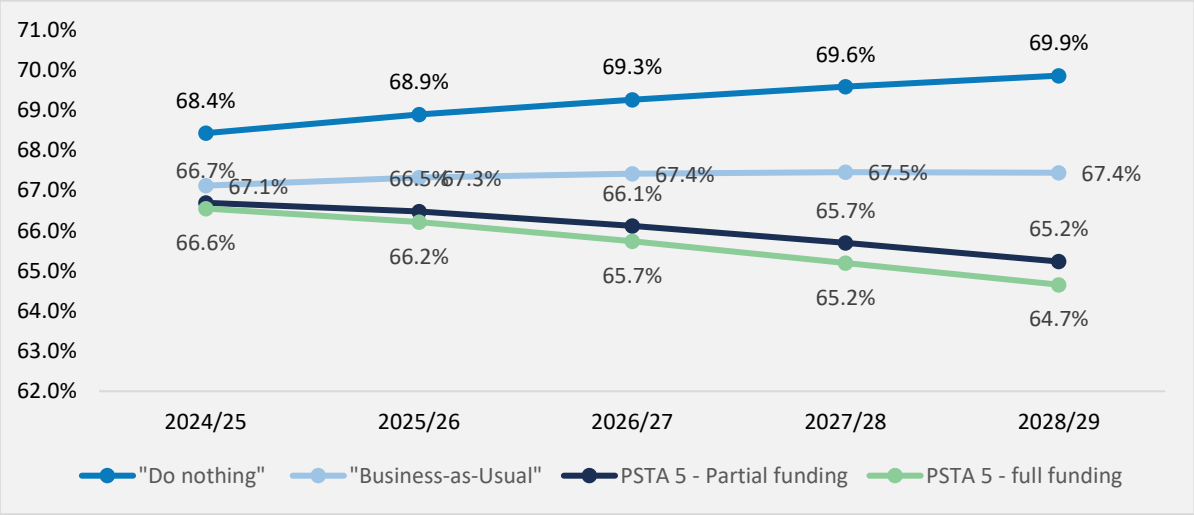


The projection on the trend of workers in primary agriculture captures the complex dynamics of structural transformation, spurred by increased agricultural productivity. As agricultural productivity improves, fewer workers are needed in primary production due to several factors namely the mechanization and technology adoption that allow farms to cultivate larger areas with less labour.

Furthermore, economies of scale, particularly in AgriHubs, enable more efficient production with fewer workers. Modern farming methods require fewer but more skilled labourers, while increased capital intensity in equipment and infrastructure reduces the relative importance of manual labour. Meanwhile, higher agricultural productivity creates jobs in adjacent off-farm sectors, such as trade/logistics, inputs provision, various services, processing, and others – especially if a larger proportion of the production are traded.

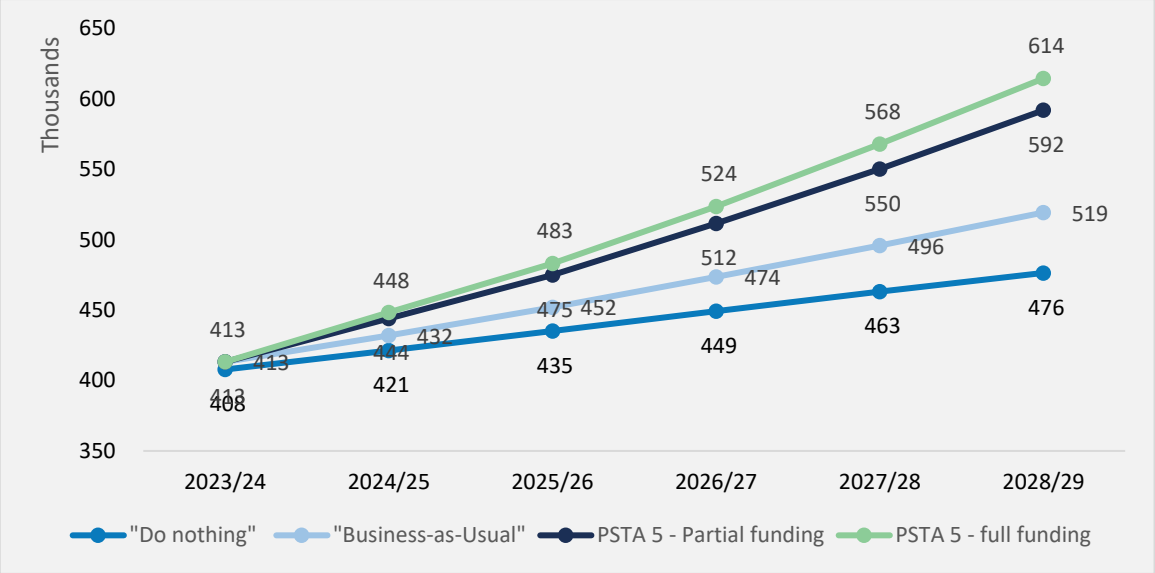
These changes collectively drive the shift from primary agriculture to off-farm employment within the Agri-food system. The model (which does not account for potential additional “pull-factors” in the urban sectors), shows a gradual transition toward the 2050 goal of reaching 15% employment in agriculture. The “do-nothing” and “business-as-usual” scenarios see the agriculture employment share increase, as the effect of a growing working-age population exceeds the effect of productivity gains. In contrast, the partial and fully funded PSTA 5 scenarios see gradual decline but would need to be accompanied by off-farm growth to reach the Vision 2050 target (Figure 5).

Figure 5: Share of workers in primary agriculture



PSTA 5 implementation is expected to contribute in creating jobs in the Agri-food systems sectors. This has been projected outside of the CGE modelling framework under the simplifying assumption that it grows proportionally to agriculture output. With this assumption, increased agricultural production produces an equivalent demand for labour in trade, logistics, processing etc. Under this assumption there will be about 644,204 workers in the off-farm Agri-food systems compared to about 400,000 today.

Figure 6: Off-farm job in the Agri-food Systems

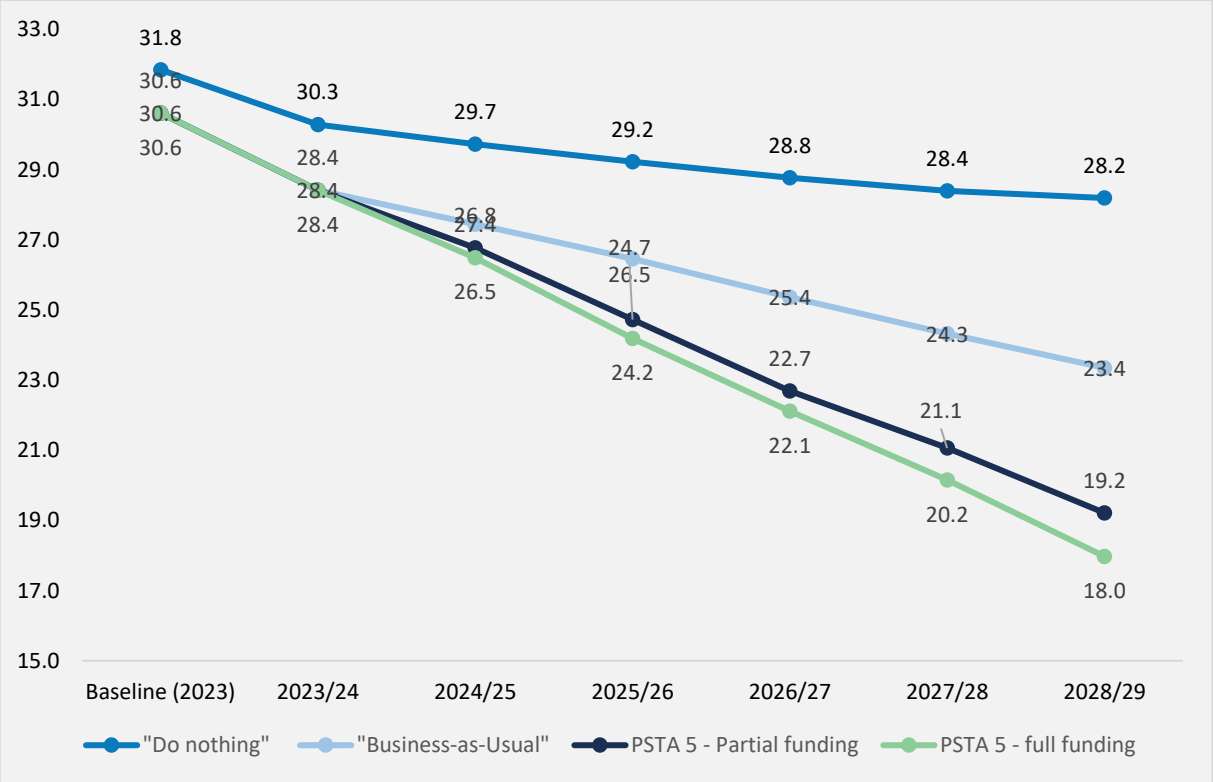


Rwanda's Food Balance Sheet[172] estimates the minimum dietary energy requirement (MDER) to be at 1741 kcal/person per day considering the age and gender composition of the population. As PSTA 5 interventions are simulated, RIAPA captures how changes in agricultural production, incomes, and food prices affect the average food availability and the distribution of food consumption. For instance, increased agricultural productivity may lead to higher food availability and lower food

172 NISR, Food Balance Sheet 2022

prices, potentially reducing undernourishment. Similarly, income growth in agricultural households may improve their food access. The fully and partially funded PSTA 5 see drastic reductions in the proportion of Rwandan accessing less than the minimum required intake – from about 30% to 18-19% (Figure 7). In contrast, the “do nothing” scenario will produce a modest decline, whereas the “business-as-usual” scenario will bring the proportion of undernourished Rwandans to 23% by the end of PSTA 5.

Figure 7: Prevalence of undernourishment (% with access to less than 1,741 kcal per day)

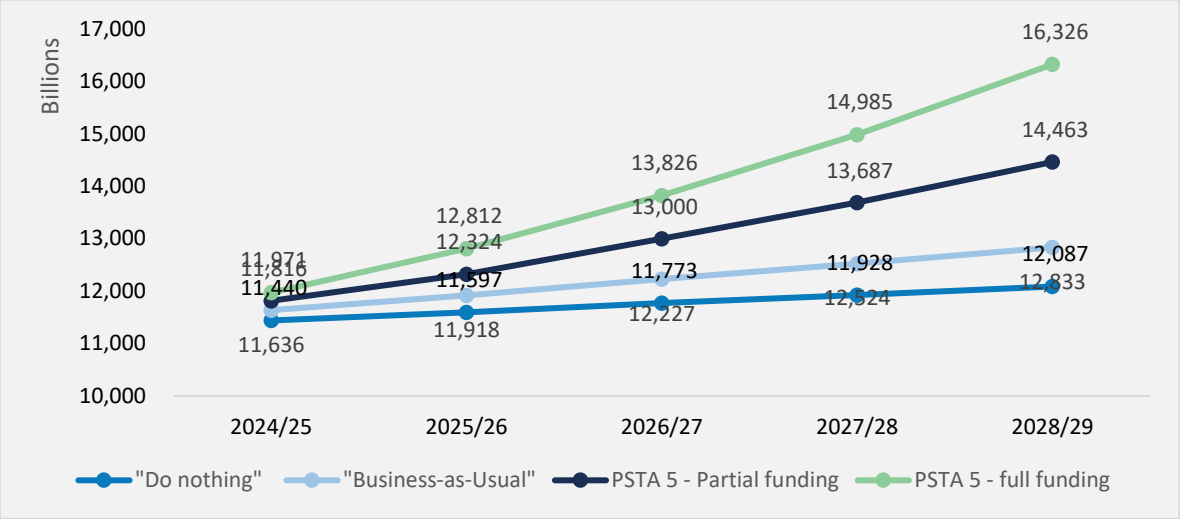


Again, there are significant differences between the PSTA 5 scenarios and the “business as usual” scenarios in terms of projected food availability, calculated in terms of dietary energy to be produced (i.e production converted into kilocalories).

To obtain projections for dietary energy production, the same four scenarios have been modelled under additional assumptions on land-use in a partial equilibrium model.[173] The model incorporates assumptions on land use and yield gains in AgriHubs, consolidated land and non-consolidated, and Production is then calculated by multiplying projected yields by harvested areas. The model also incorporates projections for animal resource production use in the RIAPA model. Again, there are significant differences between the PSTA 5 scenarios and the “business as usual” scenarios in terms of projected food availability (Figure 8).

Figure 8: Annual dietary energy production (bn kcal)

[173] Vanguard Economics, 2024, PSTA 5 Target Projection Model – Technical Note



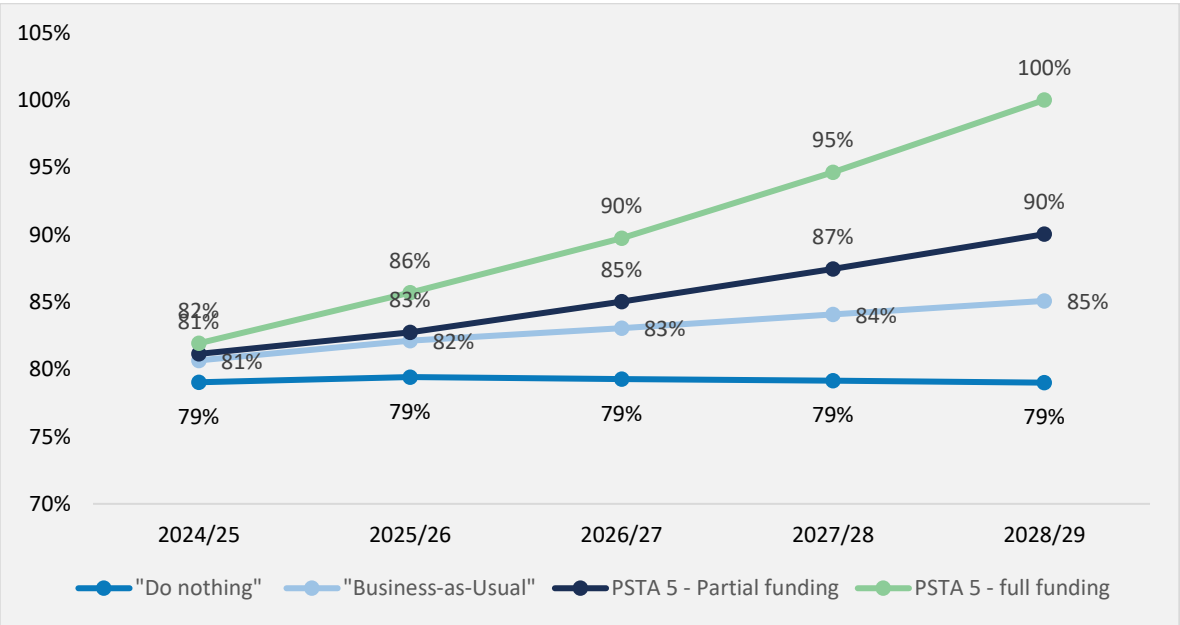
Considering the need for food self-sufficiency, a Self-Sufficiency Ratio (SSR) has been calculated. The SSR measures the extent to which domestic production can meet total food supply needs. It is calculated as: SSR = 100 × (Production) / (Production + Imports - Exports – stock change).

Imports have been modelled as the residual of the other variables in the Food balance Sheet: Imports = Production – stock change – exports – consumption loss- processing – other uses. Hence, the model incorporates further assumptions on food utilization, to project the future food balance sheet variables:

- Food consumption is assumed to grow in proportion to agricultural GDP growth, reflecting both increased availability and improved economic access to food, the population projections, and a modifier on food availability to reflect a target SSR.
- Post-harvest losses, assumed to remain a constant proportion of production for each crop.
- Processed food quantities, exports, and seeds for planting, all assumed to maintain constant shares of production.
- Animal feed demand, projected to grow in line with animal-related GDP growth.

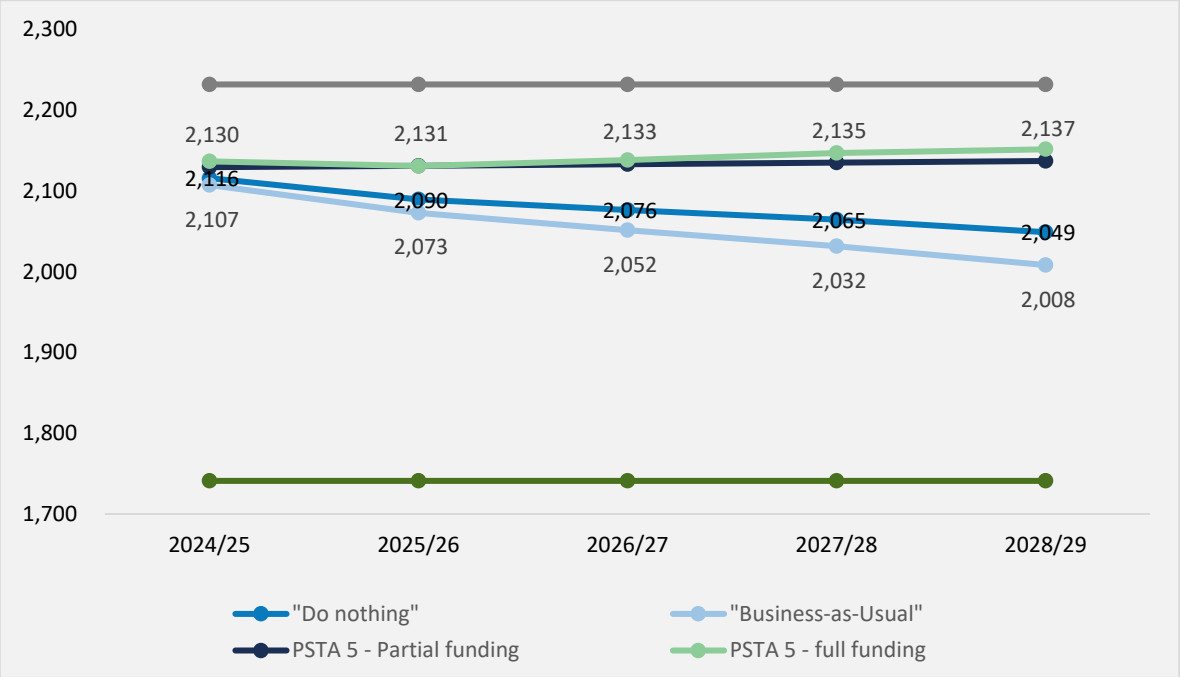
The model projects that only the fully funded scenario will allow for complete food self-sufficiency by the end of PSTA 5 (Figure 9). Meanwhile, “do nothing” will not allow for improvement from the 79% baseline.

Figure 9: Self-sufficiency ratio in dietary energy



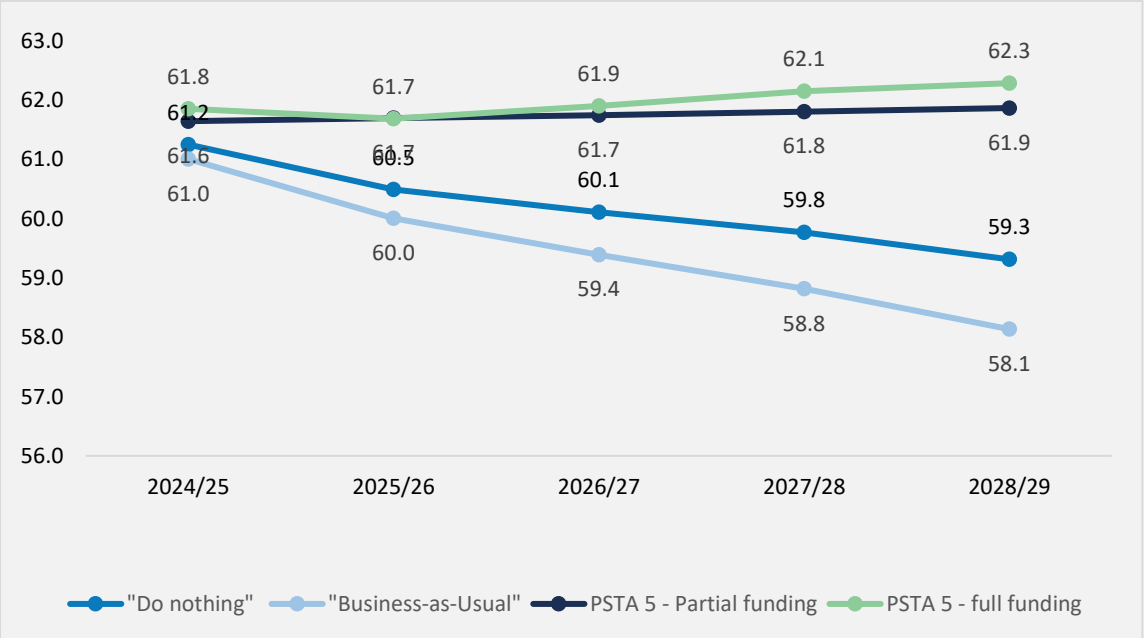
The same model projects a gradual increase in food consumption in the fully and partially funded PSTA 5 scenarios. In contrast, the "business as usual" sees a slight decline in consumption per capita, whereas the decline is more significant under "do nothing". This reflects the need for increased food production in the future as the population grows. It should be noted that there is a trade-off between increasing food consumption and increasing the SSR – increasing consumption decreases the SSR all else equal.

Figure 10: Dietary energy consumption (kcal/capita/day)



Protein consumption follows a similar pattern to dietary energy. However, the current production levels are relatively low compared to the need, so it will take more substantial and sustained increments in household incomes for longer to reach the desired levels of protein consumption of about 84 gr/person/day.

Figure 11: Protein consumption (gr/capita/day)



Monitoring, Evaluation, and Learning plan

6. Monitoring, evaluation, and learning plan

The Monitoring, Evaluation, and Learning (MEL) Plan is instrumental effective implementation of the strategy. It provides a comprehensive approach to tracking progress, assessing outcomes, and promoting evidence-based decision-making, while aligning with the Government of Rwanda's (GoR) planning cycle and incorporating systems-based strategy considerations. By aligning with the GoR's planning cycle, incorporating Joint Sector Reviews, and adopting a systems-based approach, this framework ensures that PSTA 5 remains responsive to the complex dynamics of Rwanda's Agri-food systems. It supports continuous improvement and adaptive management, increasing the likelihood of sustainable, positive impacts across the entire agricultural system in Rwanda.

The emphasis on systems thinking and its integration with national planning processes position PSTA 5 to contribute meaningfully to transformative change in Rwanda's agriculture, while remaining flexible and responsive to emerging challenges and opportunities within the broader socio-economic context.

6.1 Reporting activities

Start-up activities. There will be a PSTA 4 endline evaluation, which will serve as an overall baseline for PSTA 5 to complement the and update the baseline values in the logframe. Furthermore, outcome baselines for major programmes will be conducted where relevant and the Management Information System will be upgraded to track the indicators of the PSTA 5 log-frame.

Mid-term review and an endline evaluation to provide in-depth analyses of program performance and inform priorities for PSTA 6. Thematic studies, policy briefs, and data quality assessment reports are produced as needed to support decision-making at both the program and national levels.

Joint Sector Reviews and Annual Reports (JSRs). The reporting structure is designed to complement the GoR's planning cycle. The JSRs serve as a platform for all stakeholders to review sector performance, discuss challenges, and agree on priorities for the coming year. They also serve as bi-annual progress reports to provide regular updates on implementation progress feeding into Annual Reports for the relevant institutions.

Rapid Assessments of key interventions will be conducted regularly to provide quick insights on specific issues or emerging challenges and provide guidance of adaptive measures.

Strategic reviews and in-depth research pieces will be conducted in collaboration with partners to offer in-depth analysis of PSTA 5 implementation and strategic direction. These reviews will assess not only progress towards objectives but also how PSTA 5 is influencing the broader Agri-food systems in Rwanda.

Integration, Adaptive Management, and Systems Thinking. The insights gained from rapid assessments, strategic reviews, and JSRs will be systematically integrated into the overall MEL system and decision-making processes, using systems thinking approach. This integration will consider not only direct program outcomes but also broader system effects and feedback loops within the agricultural sector.

6.2 Establishment of a Monitoring, Evaluation and Learning (MEL) system

MEL Systems for Systems-Based Strategy. To support effective monitoring, evaluation, and learning for a systems-based strategy, several key systems will be implemented. The Management Information System (MIS) will serve as a centralized platform for data storage, management, and analysis, capable of capturing complex interactions within the agricultural system. A GIS-based mapping system will enable spatial analysis and visualization of PSTA 5 interventions and outcomes, helping to identify geographic patterns and system-wide effects. Furthermore, a robust knowledge management system

will include a repository of lessons learned, case studies, and communities of practice, with a focus on understanding and documenting system dynamics. Regular meetings and workshops will facilitate the discussion of findings with program managers and high-level decision-makers, encouraging adaptive management based on a holistic understanding of the agricultural system.

A real-time monitoring dashboard will provide an interactive interface with up-to-date information on key performance indicators, including systems-level metrics that track changes in the broader agricultural ecosystem. This system's approach will help identify unintended consequences, synergies, and leverage points within the agricultural sector.

Capacity requirements for systems thinking. The successful implementation of this MEL framework requires specific capacities, including expertise in systems thinking and analysis. A dedicated MEL unit will be established with clearly defined roles and responsibilities, including specialists in systems analysis. Regular training will be conducted to enhance skills in systems mapping, causal loop diagramming, and interpreting complex system interactions. This capacity building will extend to implementing partners to ensure a shared understanding of the systems approach across PSTA 5.

ANNEX 1: RESULTS FRAMEWORK

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
IMPACT LEVEL								
INCLUSIVE ECONOMIC TRANSFORMATION								
Agriculture GDP growth	%	GDP National Account	2.0	6.8	6.6	6.7	6.3	6.1
Agriculture exports revenue (USD Million)	USD Million	NAEB Annual Report	875	932	1,016	1,109	1,214	1,540
Off-farm jobs in the agri food system	Number off-farm jobs in Agri-food system	Labour force Survey and SAM	400,000	440,000	484,000	532,400	585,640	644,204
Women's Empowerment in Agriculture Index	Index value	IFPRI	72	-	85	-	100	-
IMPROVED FOOD AND NUTRITION SECURITY								
Percentage food secure HH (CARI indicator)	%	CFSVA	79.4 (2021)	83	-	-	88	-
Stunting rate	%	CFSVA	32.4 (2021)	30	26	22	18	15
Average Household Dietary Diversity Score	Score	CFSVA	5.5	5.94	-	-	8	-
Food self-sufficiency ratio	%	Food Balance Sheet	79.6 (2022)	81	85	90	95	100
PRIORITY AREA ONE: MODERNIZATION OF AGRICULTURE AND ANIMAL RESOURCES PRODUCTION FOR CLIMATE RESILIENT AGRIFOOD SYSTEMS								
OUTCOME 1.1: MODERNIZED CROP PRODUCTION AND PRODUCTIVITY								
Quantity of production								
Maize	MT	SAS	508,492	553,953	599,587	665,701	751,440	874,337
Paddy rice	MT	SAS	133,628	145,714	194,117	240,073	284,576	293,178
Wheat	MT	SAS	16,656	18,322	20,154	22,169	24,386	26,825
Irish Potatoes	MT	SAS	781,032	952,518	1,047,341	1,144,425	1,305,360	1,498,545
Cassava	MT	SAS	1,345,379	1,441,644	1,513,683	1,567,734	1,611,554	1,653,924
Beans (Bush and Climbing)	MT	SAS	441,406	482,480	522,408	565,009	609,472	662,115
Soybeans	MT	SAS	29,059	43,817	48,199	53,019	58,320	64,152
Sweet Potatoes	MT	SAS	1,321,080	1,350,383	1,551,398	1,622,870	1,654,891	1,669,632
Cooking Banana	MT	SAS	1,049,838	1,124,865	1,199,892	1,274,919	1,349,946	1,424,973
Peas	MT	SAS	12,117	13,329	30,412	31,193	31,992	32,807
Vegetables								
Onions	MT	SAS	14,050	15,174	16,388	17,699	19,115	20,644
Cabbage	MT	SAS	31,214	33,711	36,408	39,321	42,466	45,864
Carrot	MT	SAS	24,147	26,079	28,165	30,418	32,852	35,480

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
Egg plant	MT	SAS	49,745	53,725	58,023	62,664	67,678	73,092
Garlic	MT	SAS	2,798	3,022	3,264	3,525	3,807	4,111
French beans	MT	SAS	1,700	4,268	4,742	5,269	5,855	6,505
Pepper	MT	SAS	6,945	17,203	22,937	25,486	28,318	31,464
Fruits								
Tree tomato	MT	SAS	3,383	3,654	3,946	4,262	4,603	4,971
Pineapple	MT	SAS	12,399	13,391	14,462	15,619	16,869	18,218
Avocado	MT	SAS	1,293	6,151	7,485	9,264	11,673	14,975
Passion fruit	MT	SAS	2,523	3,923	4,322	4,762	5,247	5,783
Mango	MT	SAS	1,111	1,200	1,296	1,400	1,512	1,632
Productivity for the priority food crops								
Maize	MT/Ha	SAS	1.7	1.87	2.06	2.26	2.49	2.74
Irish Potato	MT/Ha	SAS	8.2	9.2	10.1	11.4	13.1	14.7
Rice	MT/Ha	SAS	4.0	4.3	4.5	4.8	5.1	5.4
Wheat	MT/Ha	SAS	1.2	1.29	1.3	1.32	1.34	1.35
Beans	MT/Ha	SAS	0.6	0.8	0.9	1	1.1	1.1
Soybean	MT/Ha	SAS	0.4	0.8	0.9	1	1.1	1.2
Cassava	MT/Ha	SAS	13.5	15	15.7	16.5	17.2	17.9
Cooking banana	MT/ha	SAS	14.2	16.3	17.1	17.9	18.8	19.7
Output 1.1.1. Agricultural land management and production models improved								
Agriculture land use master plan	Number (report)	MINAGRI Reports			1			
Area under Food Basket Sites	Ha	MINAGRI Reports	-	45,000	81,175	146,115	227,291	324,702
Area under AgriHubs	Ha (cumulative)	MINAGRI Reports	-	1,008	4,032	5,600	-	-
Farmers supported for household's resilience	Percent	MINAGRI Reports	31	51	56	60	64	69
Output 1.1.3. Urban and peri-urban farming promoted								
Technologies demonstrated in the horticulture of centre of excellences	Number	MINAGRI Reports	10	12	14	16	18	20
Output 1.1.4. Climate-smart agriculture practices improved								
Area under Agro-forestry	Ha	MINAGRI Reports	13,569	17,640	22,932	29,811	38,754	50,381

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
Area under Radical terraces (Cumulative)	Ha	MINAGRI Reports	142,318	146,518	150,768	155,768	161,268	167,268
Area under Progressive terraces (Cumulative)	Ha	MINAGRI Reports	1,032,282	1,044,282	1,057,282	1,071,282	1,086,282	1,102,282
Area under Shrubs/savannah restoration	Ha	MINAGRI Reports	20,656	27,418	34,180	40,943	47,705	54,467
Area under Conservation Agriculture	Ha	MINAGRI Reports		1,173	2,000	3,500	5,000	10,000
Area under Greenhouses	Ha	MINAGRI Reports	55	55	66	79	95	114
Area under banana/coffee multi-cropping	Ha	MINAGRI Reports		15,000	25,000	30,000	35,000	40,000
Farmers accessing weather information	Percent	MINAGRI Reports		20	30	45	55	65
Output 1.1.5. Irrigation and water resource management improved								
Total area under irrigation (Cumulative)	Ha	MINAGRI Reports	71,585	76,686	85,769	101,884	118,229	132,171
a) Marshland	Ha	MINAGRI Reports	37,273	37,573	37,873	39,311	40,311	42,473
b) Hillside irrigation	Ha	MINAGRI Reports	9,439	13,640	17,490	27,275	39,735	48,667
c)Small-Scale Irrigation Technology	Ha	MINAGRI Reports	24,873	25,473	30,406	35,298	38,183	41,031
Existing irrigated schemes maintained and rehabilitated	Ha	MINAGRI Reports	0	3,000	6,000	9,000	12,000	15,000
IWUOs operational	Number	MINAGRI Reports	118	25	30	40	50	55
Output 1.1.6. Access to agricultural Inputs for climate-resilient production improved								
Farm services centres established	Number	MINAGRI Annual Report		6	8	10	15	20
Farmers using improved seeds (Large scale)	Percent	NIST, Seasonal Agriculture Survey	85.7	90.0	92.0	94.0	95.0	100
Farmers using improved seeds (Small scale)	Percent	NIST, Seasonal Agriculture Survey	35.9	40	45	47	48	50
Improved quality seeds used (per crop type)	MT	MINAGRI Reports	7,575.6	7,954	8,351	8,769	9,207	9,668

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
Farmers using climate resilient seed varieties	Percent	MINAGRI Reports	33	36	40	44	48	53
Inorganic fertilizers used	MT	MINAGRI Report	96,372.9	101,191	106,250	111,563	117,141	132,440
Inorganic fertilizers application per ha	Kg/ha	MINAGRI Report	70.3	72.2	75.8	79.6	83.6	94.6
Lime used	MT	NIST, Seasonal Agriculture Survey	14,226.5	15,649	17,213	18,935	20,828	22,911
Farmers using inorganic fertilizer (Large scale)	Percent	NIST, Seasonal Agriculture Survey	86	90	92.5	93	94.5	95
Farmers using inorganic fertilizer (Small scale)	Percent	NIST, Seasonal Agriculture Survey	54.9	57.5	60.3	62.8	64.5	66.5
Bio-fertilizers produced	MT	MINAGRI Reports	0	2,000	2500	3000	3500	4500
Output 1.1.7: Plant Health Management enhanced								
Pest/disease surveillance conducted	Numbers done each year	MINAGRI Report		2	2	2	2	2
Farmers using pest and disease surveillance tools	Percent	MINAGRI Report		10%	20%	30%	40%	50%
Farmers (male and female) using IPM practices	Percent	MINAGRI Report		10%	20%	30%	40%	50%
Output 1.1.8. Mechanization and labour-saving technologies promoted								
Operational Mechanization Centre of excellence	Number	MINAGRI Report	0	0	1	1	1	1
Agriculture land under mechanisation	Ha	MINAGRI Report	81,711	84,000	90,000	92,000	95,000	100,000
OUTCOME 1.2: MODERNIZED ANIMAL RESOURCES PRODUCTION AND PRODUCTIVITY								
Milk	MT	MINAGRI Report	1,061,301	1,114,366	1,167,431	1,220,496	1,273,561	1,323,561
Meat	MT	MINAGRI Report	197,778	207,667	217,556	227,445	237,334	247,223
Beef	MT	MINAGRI Report	66,268	72,957	76,431	79,905	83,379	86,853
Goat meat	MT	MINAGRI Report	34,853	34,903	36,565	38,227	39,889	41,551
Sheep meat	MT	MINAGRI Report	8,818	9,708	10,170	10,633	11,095	11,557

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
Poultry meat	MT	MINAGRI Report	53,319	55,398	58,036	60,674	63,312	65,950
Pork meat	MT	MINAGRI Report	25,839	25,144	26,342	27,539	28,736	29,934
Rabbit meat	MT	MINAGRI Report	8,681	9,557	10,012	10,467	10,923	11,378
Honey	MT	MINAGRI Report	7,250	8,315	10,495	12,675	14,855	17,035
Eggs	MT	MINAGRI Report	20,211	29,855	34,484	44,945	49,812	51,680
Fish	MT	MINAGRI Report	46,495	54,000	59,000	64,500	71,000	77,700
of which from fisheries	MT	MINAGRI Report	39,000	41,000	41,000	41,500	42,000	42,700
of which from aquaculture	MT	MINAGRI Report	7,495	13,000	18,000	23,000	29,000	35,000
Output 1.2.1. Animal husbandry and infrastructure in animal hubs improved								
Animal resources production hubs (meat, dairy, eggs & fish)	Number (cumulative)	MINAGRI Report	30	35	40	43	45	50
Boreholes constructed (including solar powered)	Number	MINAGRI Report	49	20	25	25	25	30
Valley dams rehabilitated	Number	MINAGRI Report	25	5	5	5	5	5
Livestock sheds constructed	Number	MINAGRI Report		2,200	2,300	2,300	2,300	2,300
Output 1.2.2. Sustainable animal breeding established								
Functional centre of excellence for animal genetics	Number	MINAGRI report	0	0	1	1	1	1
Animal breeding centres operational	Number	MINAGRI report	15	18	21	23	24	24
Certified poultry hatcheries established	Number	MINAGRI report	5	5	5	6	6	7
Certified breeders (cattle, pig, rabbit)	Number	MINAGRI report	0	207	508	810	1,111	1,413
Liquid Nitrogen plants operational	Number	MINAGRI report	2	2	3	3	4	5
Queen-rearing centres for bees established	Number	MINAGRI report	0	0	1	2	3	4

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
Skilled Technicians in bovine artificial Insemination technique and embryo transfer trained (disaggregated by Gender/age)	Number	MINAGRI report	900	950	1,000	1,050	1,100	1,050
Cows inseminated	Number	MINAGRI report	109,209	115,277	130,313	147,311	166,525	188,245
Pigs artificially inseminated	Number	MINAGRI report	19,860	21,846	24,031	26,434	29,077	31,985
Skilled technicians in Pig Artificial Insemination trained (disaggregated by Gender/age)	Number	MINAGRI report	800	850	900	950	1,000	1,050
Output 1.2.3. Access to animal feed improved								
Area planted with improved forages (including climate resilient forage seeds)	Ha	MINAGRI report	11,718	12,000	12,500	13,000	14,000	15,300
Support forage seed multipliers (including climate smart seed varieties)	Number	MINAGRI report	96	126	156	186	216	246
Access to Machinery used in fodder harvesting and processing	Number	MINAGRI report	13	50	100	150	200	250
Local animal feeds production	MT	MINAGRI report	77,023	89,481	103,955	120,770	140,305	163,00
Output 1.2.4. Animal health systems strengthened								
National epidemic-surveillance report produced	Number	MINAGRI report	2	2	2	2	2	2
Veterinary clinics established	Number	MINAGRI report	16	96	176	256	336	416
Private Veterinary Officers (Doctors) involved in the implementation of Veterinary Sanitary Mandate	Number	MINAGRI report	522	677	696	716	736	755
Private Veterinary Officers (Technicians) involved in the implementation of Veterinary Sanitary Mandate	Number	MINAGRI report	3,804	13,539	13,927	14,318	14,712	15,109
Cattle vaccinated	Number	MINAGRI report	986,815	999,150	1,006,552	1,021,354	1,031,222	1,088,245
Goats vaccinated	Number	MINAGRI report	997,818	1,415,223	1,824,757	2,085,436	2,085,436	2,215,776
Sheep vaccinated	Number	MINAGRI report	220,107	337,926	442,224	505,398	505,398	536,986
Pigs vaccinated	Number	MINAGRI report	250,000	727,752	808,614	875,998	1,145,536	1,583,535
Rabbits vaccinated	Number	MINAGRI report	-	38,650	85,225	271,799	376,980	483,587
Poultry vaccinated	Number	MINAGRI report	6,000,000	3,174,788	3,999,632	4,899,549	5,881,059	6,565,307

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
Cattle registered	Percent	MINAGRI report		80	85	90	100	**100**
Pigs registered	Percent	MINAGRI report		50	60	70	80	90
Output 1.2.5. Fisheries and aquaculture developed								
National Aquaculture Research Centre operationalized	Number	MINAGRI report			1	1	1	1
Aquaparks operational	Number	MINAGRI report		10	20	30	40	50
Fingerlings produced for aquaculture	Number	MINAGRI report	16,000,000	20,000,000	26,000,000	36,000,000	46,000,000	58,000,000
Fish Hatchery constructed through private investment	Number	MINAGRI report	13	14	15	16	17	18
Output 1.2.6: Beekeeping developed								
Appropriate reserves for beekeeping established	Number	MINAGRI report	2	1	1	1	1	1
Commercial apiary (beekeeping) farms promoted	Number	MINAGRI report		2	2	2	2	2
PRIORITY AREA II: INCLUSIVE MARKETS AND POST-HARVEST MANAGEMENT FOR SUSTAINABLE AGRI-FOOD SYSTEMS								
OUTCOME 2.1: BOOSTED AGRICULTURE EXPORTS								
Export revenues increased								
1. Coffee	USD dollars	MINAGRI report	78,712,092	85,009,059	91,809,784	99,154,567	107,086,932	115,563,887
2. Tea	USD dollars	MINAGRI report	107,768,322	119,106,935	130,445,548	141,784,161	153,122,774	164,461,387
3. Pyrethrum and Essential Oil								
(a) Pyrethrum	USD dollars	MINAGRI report	8,063,749	8,547,574	9,060,428	9,604,054	10,1801,897	10,791,115
(b) Essential oils	USD dollars	MINAGRI report	3,007,087	3,037,158	3,340,873	3,674,961	4,042,457	4,446,703
4. Fruits								
(a) Avocado	USD dollars	MINAGRI report	6,342,472	7,666,879	8,991,286	10,315,693	11,640,099	12,964,506

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
(b) Passion Fruits	USD dollars	MINAGRI report	245,712	422,828	465,110	511,621	562,784	619,062
5. Vegetables								
(a) Chili	USD dollars	MINAGRI report	6,080,949	11,689,040	16,651,364	23,720,333	33,790,276	48,135,192
(b) French beans	USD dollars	MINAGRI report	2,850,684	3,935,725	4,624,477	5,433,760	6,384,668	7,501,985
Flowers	USD dollars	MINAGRI report	2,163,055	2,594,666	3,114,799	3,738,759	4,485,311	5,382,373
6. Animal and livestock products								
(a) Eggs	USD dollars	MINAGRI report	2,205,544	13,648,990	25,092,436	36,535,882	47,979,329	59,422,775
(b) Fish	USD dollars	MINAGRI report	46,653,031	117,617,771	188,582,511	259,547,251	330,511,992	401,476,732
(c) Dairy products	USD dollars	MINAGRI report	12,921,346	28,265,621	43,609,895	58,954,170	74,298,445	89,642,719
Output 2.1.1: Export crops expanded								
Area under Export crops								
Coffee	Ha	MINAGRI report	42,229	42,729	43,229	43,729	44,229	44,729
Tea	Ha	MINAGRI report	31,498	33,165	34,832	36,499	38,166	39,833
Pyrethrum	Ha	MINAGRI report	3,070	3,225	3,380	3,525	3,680	3,845
Essential oils	Ha	MINAGRI report	66	388	711	1,033	1,355	1,678
French beans	Ha	MINAGRI report	149	164	180	198	218	240
Chili	Ha	MINAGRI report	533	760	1,082	1,542	2,196	3,129
Avocado	Ha	MINAGRI report	517	540	619	707	794	881

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
Passion fruit	Ha	MINAGRI report	34	35	39	43	47	52
Macadamia	Ha	MINAGRI report	605	659	707	791	844	933
Flowers	Ha	MINAGRI report	65	78	87	95	104	113
Export crops production								
Coffee	MT	MINAGRI Report	20,046.9	21,386.9	23,328	25,920	28,800	32,000
Tea	MT	MINAGRI Report	39,008.9	41,500	42,719	47,466	52,740	58,600
Pyrethrum	MT	MINAGRI Report	35	38	41	45	50	55
Vegetables	MT	MINAGRI Report	51,689	67,197	87,356	113,563	147,632	191,921
Fruits	MT	MINAGRI Report	21,953	26,344	31,612	37,935	45,522	54,626
Flowers	MT	MINAGRI Report	413	508	625	769	945	1,163
Output 2.1.2: Rwandan agri-exports de-commoditized								
Tea sold under direct agreement	Percent	MINAGRI report	24%	26%	30%	35%	40%	45%
Supply agreements in high-value markets for priority commodities	Number	MINAGRI report	2	5	5	5	5	5
Agri-exports facilities for value-addition and diversification	Number	MINAGRI report		1	3	3	2	1
OUTCOME 2.2: STRENGTHENED MARKET LINKAGES AND POST-HARVEST INFRASTRUCTURES								
Employed population in market-oriented agriculture (gender and age disaggregated)	Percent	Labour Force Survey	43.5%	45%	50%	55%	60%	70%
Household reporting active membership of a cooperative	Percent	Agriculture Household Survey	13% (2020)	15%	17%	19%	21%	23%
Food crop gross value added sold	Percent	Seasonal Agriculture Survey	35%	38%	41%	44%	47%	50%

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
Reduction of post-harvest losses in priority staple crops	Percent	MINAGRI report	13.8%	12%	11%	10%	9%	8%
Annual growth in agro-processing gross value added	Percent	NISR, National Accounts	8.8%	10%	10%	10%	10%	10%
Output 2.2.1: Organisation models of farmers and value chain actors improved								
Cooperatives supported in AgriHubs	Number	MINAGRI report	30	30	60	80	80	80
Women or youth-led cooperatives supported	Number	MINAGRI report	15	15	30	40	40	40
Output 2.2.2: Post-harvest handling for reduced losses improved								
Food crop storage facilities constructed (silos and warehouses)	Number (Cumulative)	MINAGRI report	530	535	540	545	550	555
Animal feeds factories constructed (including fish feeds industry)	Number	MINAGRI report	13		2	1	1	1
Cold storage facilities established and upgraded (Cumulative)	Number	MINAGRI report	90	95	100	105	110	120
New MCCs constructed and operationalized (Cumulative)	Number	MINAGRI report	134	136	154	188	191	193
New MCPs constructed and operationalized (Cumulative)	Number	MINAGRI report	150	154	186	222	226	230
Landing sites (Fish)	Number	MINAGRI report	1	5	5	5	3	3
Fish Drying flakes (small fish)	Number	MINAGRI report	4	4	4	3	3	1
Smoking areas (fish)		MINAGRI report	27	1		1		1
Mobile dryers for cereals (cumulative)	Number	MINAGRI report	48	56	76	96	116	141
Drying shelters (Maize and beans) (cumulative)	Number	MINAGRI report	944	969	1,024	1,089	1,149	1,199
Drying grounds (Rice and wheat) (Cumulative)	Number	MINAGRI report	585	595	635	687	735	765

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
Collection centres (Irish potato, cassava, vegetables, honey and eggs etc.) (cumulative)	Number	MINAGRI report	148	160	165	170	175	180
Output 2.2.3: Agriculture commodity safety and quality Increased								
Testing facilities for safety and quality parameters upgraded	Number	MINAGRI report	0	1		2		1
Traceability system established	Number	MINAGRI report	0		1			
Output 2.2.4: Value addition increased								
Value addition facilities supported	Number	MINAGRI report	10	26	31	36	36	41
Output 2.2.5: Trade infrastructures improved								
Wholesale markets established (Kigali Wholesale Market) established	Number	MINAGRI report	0			1		
Animal and Livestock markets operational	Number	MINAGRI report	10	11	12	13	14	15
Need Assessments for infrastructures (e.g. feeder roads, electricity, water)	Number	MINAGRI report		1	1	1	1	1
OUTCOME 2.3: IMPROVED FOOD SECURITY AND NUTRITION								
Average household dietary diversity score	Score	CFSVA	5.5 (2021)	6.0	6.5	7.0	7.5	8.0
Animal products consumption per capita								
a. Meat	Kg/Person/Year	MINAGRI Report	14.2	15.6	17.2	18.9	20.8	22.9
b. Milk	l/person/year	MINAGRI Report	78.0	85.8	94.4	103.8	114.2	125.6
c. Fish	Kg/Person/Year	MINAGRI Report	4.0	4.4	4.8	5.3	5.9	6.4
d. Eggs	Kg/Person/Year	MINAGRI Report	1.4	1.5	1.7	1.9	2.0	2.3
Output 2.3.1: Food security and nutrition improved								
Biofortified seeds produced (per crop type)								
a. Beans	MT	MINAGRI Report	3,000	3,500	4,000	4,500	5,000	5,500

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
b. sweet potato	Cuttings	MINAGRI Report		3,000	3,000	3,000	3,000	3,000
c. Cassava	Cuttings	MINAGRI Report		4,000	4,000	4,000	4,000	4,000
e. Potato	MT	MINAGRI Report		5,000	5,500	6,000	6,500	7,000
Household with kitchen garden	Percent	MINAGRI Report	36%	36%	40%	42%	44%	46%
Schools with school garden	Percent	MINAGRI Report	69%	70%	75%	80%	85%	90%
Traceability system of fortified agricultural products	Number	MINAGRI Report				1		
National dietary guidelines and nutrition sensitive agriculture guidelines disseminated through campaigns	Number (Campaign per year)	MINAGRI Report	2	2	2	2	2	2
Output 2.3.2: Households supported in Animal resources production and Nutrition-Sensitive crop production (at least 30% distributed to women headed households)								
Cows in the Girinka program distributed	Cows	MINAGRI Report	467,898	25,000	28,000	30,000	33,000	35,000
Vegetable seeds for kitchen garden distributed	MT	MINAGRI Report		1	1	1	1	1
Goats' distributed	Number	MINAGRI Report	3,416	18,630	20,436	22,500	25,785	30,890
Pigs' distributed	Number	MINAGRI Report	2,662	12,500	14,680	17,320	18,500	20,700
Sheep distributed	Number	MINAGRI Report	2,687	7,425	9,800	11,908	13,769	15,740
Fruits trees distributed	Number	MINAGRI Report	440,000	580,000	730,000	930,000	1,150,000	1,400,000
Rabbit distributed	Number	MINAGRI Report		1,500	2,000	3,000	4,000	5,000
Poultry distributed	Number	MINAGRI Report	94,643	143,720	145,600	147,890	150,000	160,000
Output 2.3.3: Food stability and mitigating related shocks ensured								
Private-Led Commodity Reserves Strengthened	Operational	MINAGRI Report	0	1	1	1	1	1
Food Monitoring and Price Projection Reports produced	Reports	MINAGRI Report	0	4	4	4	4	4
Quantity of grains stored as strategic reserves	MT	MINAGRI Report	25,312	31,678	32,150	35,000	37,500	43,000

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
Maize	MT	MINAGRI Report	15,478.7	16,478	16,000	17,500	18,500	20,000
Beans	MT	MINAGRI Report	9,832.8	11,200	11,500	12,000	12,500	15,000
Rice	MT	MINAGRI Report	0	2,500	3,000	3,500	4,000	5,000
Soya	MT	MINAGRI Report	0	1,500	1,650	2,000	2,500	3,000
National storage capacity of food crops (cumulative)	MT	MINAGRI Report	318,025	330,025	345,025	365,025	390,025	420,025
Grain storage capacity (silos) for animal feeds	MT	MINAGRI Report	0	15,000	20,000	25,000	30,000	35,000
PRIORITY AREA III: STRENGTHENING AGRI-FOOD SYSTEMS ENABLERS FOR EFFECTIVE AND EFFICIENT DELIVERY								
OUTCOME 3.1: STRENGTHENED RESEARCH AND TECHNOLOGY TRANSFER FOR AGRI-FOOD SYSTEMS TRANSFORMATION								
Farmers adoption rate of modern and climate resilient agricultural practices	Percent	MINAGRI Report				50%		70%
Farmers (male & female) accessing extension (including climate smart) services through the CAES	Number	MINAGRI Report	1,300,000	1,951,311	2,087,902	2,234,055	2,390,439	2,557,770
Coverage of agricultural extension services	Percent	MINAGRI Report	35	51	56	60	64	69
Output 3.1.1: Demand-driven research enhanced								
New market-driven animal breeds introduced	Number	MINAGRI Report		5	9	10	11	11
Crop varieties developed (climate resilient, disease resistant) total for all crops	Number	MINAGRI Report	77	19	5	24	9	13
Research stations (laboratory, equipment) upgraded	Number	MINAGRI Report	0	2	2	2	2	2
Green houses facilities established	Number	MINAGRI Report	29	2	2	2	2	2
Crop Suitability Maps developed	Number	MINAGRI Report	1	0	1	0	1	0

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
Biotechnology products (genetically modified products), protocols and laws developed.	Number	MINAGRI Report	0	0	1	1	1	1
Plant genetic resources conserved	Number	MINAGRI Report	1,642	230	230	230	230	230
Forage genetic resources conserved	Number	MINAGRI Report	146	20	20	20	20	20
Local animal genetic resources characterized and conserved	Number	MINAGRI Report	404	60	60	60	60	60
Post-harvest technologies developed	Number	MINAGRI Report	TBD	1	1	2	1	1
Output 3.1.2: Customised agriculture extension system enhanced								
Master trainers trained on specific value chain and their segments	Number	MINAGRI Report	250	250	250	250	250	250
Extension agents (such as FFS facilitators, FPs) trained on the delivery of new extension packages and facilitated (disaggregated by gender/age)	Number	MINAGRI Report	16,654	17,000	17,000	17,500	18,500	21,620
L-FFS groups established by L-FFS Facilitators	Number	MINAGRI Report	400	600	600	600	600	600
FFS of fish farmers established	Number	MINAGRI Report	30	30	30	30	30	30
Market actors trained in aquaculture and fisheries	Number	MINAGRI Report	100	100	100	100	100	100
Output 3.1.3: Technical capacity, education, and skills developed								
Youth and professional farmers trained on technical courses by education institutions and other relevant specialised institutions	Number (cumulative)	MINEDUC report	250	450	650	850	1,050	1,250
Long term training in Agri-food systems provided	Number	MINEDUC report		8	8	8	8	8
On-job specialised and professional short courses in the Agri-food systems provided	Number	MINAGRI report		50	50	50	50	50
OUTCOME 3.2: STRENGTHENED AGRICULTURE DE-RISKING FOR RESILIENCE								
Credit to agriculture sector as percentage of total loans	Percent	BNR, Monetary Statements	6	6	7	8	9	10

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
Farmers accessing credit from banks or other formal financial services providers/sources (gender and age disaggregated data)	Percent	NISR, Finscope	16% (2021)	16%	19%	22%	27%	32%
Crop farmers with agriculture insurance	Percent	NISR, Agriculture Household Survey	1% (2020)	5.7%	6.0%	6.2%	6.5%	6.8%
Animal farmers with agriculture insurance	Percent	NISR, Agriculture Household Survey	1% (2020)	1.5%	1.7%	1.8%	1.9%	2.1%
Output 3.2.1: Access to agriculture finance increased								
De-risking facility established and operationalized	Number	MINAGRI reports	1	1	1	1	1	1
Output 3.2.2: Agriculture insurance scheme strengthened								
Guidelines for insurance products developed and operationalize	Number	MINAGRI Report	1	1	1	1	1	1
Crop insured								
Rice	Ha	MINAGRI Report	23,696	23,826	23,926	24,026	24,126	24,226
Maize	Ha	MINAGRI Report	7,932.37	9,519	11,105	12,692	14,278	15,865
Irish Potatoes	Ha	MINAGRI Report	1075.6	2,662	4,249	5,835	7,421	9,008
Soya bean	Ha	MINAGRI Report	222.6	1,809	3,396	4,982	6,568	8,155
Beans	Ha	MINAGRI Report	215.4	1,802	3,388	4,975	6,561	8,148
Cassava	Ha	MINAGRI Report	0	1,586	3,173	4,759	6,346	7,932

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
Chili	Ha	MINAGRI Report	102.27	340	578	816	1,054	1,292
French beans	Ha	MINAGRI Report	150	263	501	739	977	1,215
Livestock Insured								
Cattle	Number	MINAGRI Report	48,962	49,962	51,462	53,462	55,962	58,962
Pig	Number	MINAGRI Report	7,300	27,300	52,300	82,300	117,300	157,300
Poultry	Number	MINAGRI Report	274,506	294,506	324,506	364,506	414,506	474,506
Fishponds/farms	Number	MINAGRI Report	800	5,200	9,900	16,100	24,650	35,000
Rabbits access to insurance scheme	Number	MINAGRI Report	196,846	426,499	541,326	629,907	1,104,634	1,189,606
Professionals (public & Private) trained on agriculture insurance	Number	MINAGRI Report		4,054	4,729	5,405	6,080	6,756
OUTCOME 3.3: DIGITISED AGRI-FOOD SYSTEMS								
Farmers with access to a cell phone	Percent	Finscope report	85% (2021)	87%	89%	91%	93%	95%
Farmers using mobile payment	Percent	Finscope report	55%	60%	63%	66%	69%	72%
Output 3.3.1: Affordable digital technologies developed								
Farmers supported to own or use devices though telco collaboration	Number	MINAGRI report		50,000	100,000	200,000	300,000	500,000
Farmers registered in AMIS	Number	MINAGRI report		100,000	500,000	700,000	700,000	700,000
Output 3.3.2: Data governance enhanced								
Data strategy and governance framework in place and operationalized	Number (framework)	MINAGRI report		1	1	1	1	1

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
Relevant data stored in the expanded and incentivized data collection network	Percent	MINAGRI report		10%	20%	30%	40%	50%
Output 3.3.3: Digital innovation in agriculture value chains promoted								
Agri-tech services supported	Number	MINAGRI report		5	10	10	20	30
Output 3.3.4: Digital competencies developed								
Farmers trained in digital literacy or using specific services	Number	MINAGRI report		20,000	50,000	100,000	2,000,000	3,000,000
Output 3.3.5: Sustainable business models for digital systems and platforms developed								
Investors for digital platforms mobilised	Number	MINAGRI report		1	2	4	6	8
Output 3.3.6: Digitalization networking strengthened								
Digital taskforce in place and operationalized	Number	MINAGRI report		1	1	1	1	1
OUTCOME 3.4: STRENGTHENED AGRI-FOOD SYSTEMS PLANNING AND COORDINATION								
Budget execution rate	Percent	MINAGRI Report	90%	100%	100%	100%	100%	100%
Foreign Direct Investment in Agriculture and agro-processing	USD million	MINAGRI Report	23.2	30	50	70	100	150
Enabling the Business of Agriculture score	Score	World bank	41.43	43	47	50	55	60
Output 3.4.1: Capacity for planning and knowledge management enhanced								
Professional short course training	Number							
Programmes designed and funded	Number	MINAGRI report		6	2	2	2	2
Innovative and impactful Projects designed under PSTA 5	Number (Projects)	MINAGRI report	30	35	35	35	40	40
Output 3.4.2: Agri-food systems coordination and value chains developed								
Business plans for value chain development packaged for entrepreneurs	Number	MINAGRI Report		8	8	8	8	8
Public private partnerships in agro-processing/food systems support functions operational (inputs, feed, packaging, biofortified products etc.)	Number	MINAGRI Report	2	3	4	5	6	7
Values chain-based platforms established and operationalized	Number	MINAGRI Report	7	8	10	12	15	15

Indicator	Unit	Source	Baseline (2023)	2024/25	2025/26	2026/27	2027/28	2028/29
Food commodity board established	Number	MINAGRI Report			1			
Output 3.4.3: Policy and regulatory reform for an enabling environment reviewed								
Coordination meetings (Agriculture Sector and Sub-Sector Working Group Meetings)	Number	MINAGRI Report	4	12	12	12	12	12
Join sector review meeting	Number	MINAGRI Report	2	2	2	2	2	2
Policy and Regulatory Reforms	Regulations/report	MINAGRI Report		2	2	2	2	2
Technical regulation framework developed for agricultural products safety and quality	Number				1			
Output 3.4.4: Institutional reforms for effective implementation enhanced								
Institutional reform for PSTA 5 implementation conducted	Number	MINAGRI Report			1			
National CAES Secretariat established	Number	MINAGRI Report		1				
Rwanda Forum for Agricultural extension and Advisory Service professionals Established	Number	MINAGRI Report			3	3	3	3
Food Systems Secretariat	Number	MINAGRI Report		1	1	1	1	1

ANNEX 2: OPERATIONAL PLAN

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/29
PRIORITY AREA ONE: MODERNIZATION OF AGRICULTURE AND ANIMAL RESOURCES PRODUCTION FOR CLIMATE -RESILIENT AGRIFOOD SYSTEMS							
OUTCOME 1.1 MODERNIZED CROP PRODUCTION AND PRODUCTIVITY							
Output 1.1.1 Agricultural land management and production models improved							
1.1.1.1	**Agriculture Land-use Masterplan**						
	Develop Agriculture Land-use Masterplan (LUMP)	Masterplan		1			
	Produce regulations and guidelines for land lease and contract farming	Guidelines & regulations		1	2		
	Conduct consultative meetings with various stakeholders	Number		12			
	Organize validation session of LUMP	Number		1			
1.1.1.2	**Operationalization of Food Basket Sites (FOBASI)**						
	Food Basket Sites promoted and operationalized	Ha	35,717	45,458	64,940	81,176	97,411
	Establish guidelines for Food Basket Sites development	Number	1				1
	Organize mobilization meeting with farmers and leaders	Number	9	9	9	9	9
	Capacity building of cooperatives members in the Food Basket Sites (FOBASI)	Number	7,000	7,000	4,680	3,510	2,340
	Support FOBASI Cooperatives with professional managers	Number	30	30	30	30	30
	Train extension agents under FOBASI	Number	150	150	150	150	150
1.1.1.3	**AgriHubs establishment**						
	Promote and operationalize agri-Hubs	Ha	-	1,008	3,024	1,568	-
	Develop guidelines for agri-hub	Guidelines	1				
	Develop Agri-hub business plan	Number	5	8	11	16	20
Output 1.1.2. Small-holder farmers supported for household resilience							

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/ 29
1.1.2.1	**Support smallholders to create Food Basket Sites**						
	Facilitate access to land tenure and leasing arrangements	Number (Outreach staff)	100	100	100	100	100
	Support smallholder farmers with improved seeds (maize)	Kg	323	343	402	432	482
	Support smallholder farmers with cuttings (cassava, sweet potatoes)	Cuttings	700,000	800,000	1,200,000	1,500,000	2,000,000
	Support smallholder farmers with fertilisers	MT	8,500	9,500	10,000	12,000	15,000
Output 1.1.3. Urban and peri-urban farming promoted							
1.1.3.1	**Promotion of vertical farming (Kitchen garden, aquaponic, hydroponics,)**						
	Support the extension of the Horticulture center of excellence	Number (report)	1	1	1	1	1
	Establish demonstration sites	Number	10	15	20	25	30
	Organize technology transfer exhibition	Number	1	1	1	1	1
	Distribute quality seedlings (Fruits) for urban agriculture	Seedlings	700,000	800,000	900,000	1,000,000	1,200,000
	Facilitate the establishment of a plant for compost production from urban organic waste	Number		1			
1.1.3.2	**Capacity building of Youth and Women groups in urban agriculture technologies and opportunities**						
	Support business plans for youth and women' cooperatives	Number	25	50	100	120	150
	Organize training for youth and women' cooperatives on urban farming	Number (Cooperatives)	50	70	80	85	100
	Mobilize farmers for high value crops	Number	10	12	12	12	12
	Link farmers with buyers through contract farming	Number	10	15	15	20	25
1.1.3.3	**Agro-eco-tourism opportunities**						
	Identify agro-eco-tourism opportunities	Number (cumulative)	5	7	15	25	30
	Organize trainings on agro-eco-tourism	Number	250	250	250	250	250

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/ 29
	Conduct awareness campaigns on agro-eco-tourism	Number	2	2	2	2	2
Output 1.1.4. Climate-smart agriculture practices improved							
1.1.4.1.	**Soil erosion control**						
	Plantation of agro-forestry	Ha	17,640	22,932	29,811	38,754	50,381
	Develop Radical terraces	Ha	4,200	4,250	5,000	5,500	6,000
	Develop progressive terraces	Ha	12,000	13,000	14,000	15,000	16,000
	Wooded Savannah / shrub restoration	Ha	27,418	34,180	40,943	47,705	54,467
	Expand area under conservation agriculture	Ha	1,173	11,000	50,000	70,000	100,000
	Increase area under greenhouse	Ha	55	66	79	95	114
1.1.4.2.	**Climate smart information systems and advisory services**						
	Map hot spot in agriculture (risk zone)	Number (report)	1	1	1	1	1
	Organize training session	Number	2,148	2,200	2,250	2,500	3000
	Train master trainer in climate smart agriculture	Number	1,300	1,350	1,400	1,450	2000
	Operationalize crop monitoring system	Number	3	3	3	3	3
Output 1.1.5. Irrigation and water resource management improved							
1.1.5.1	**Development and rehabilitation of irrigation areas**						
	Marshlands	Ha	300	300	1,438	1,000	2,162
	Hillside irrigation	Ha	4,201	3,850	9,785	12,460	8,932
	Small-scale technologies	Ha	600	4,933	4,892	2,885	2,848
	Rehabilitate and maintain existing irrigation schemes	Ha	3,000	6,000	9,000	12,000	15,000
1.1.5.2	**Management of Irrigation Water User Organizations (IWUOs)**						

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/ 29
	Support organization and registration of IWUOs	Number	25	30	40	50	55
	Train members of IWUOs and cooperatives managing irrigation schemes on proper water management	Number	1,380	1,679	1,820	2,000	2,150
1.1.5.3	**Adoption of water saving technologies**						
	Pilot water saving technologies	Number	1	2	3	5	7
	Disseminate water saving technologies to users	Number	-	factory 1	2	3	5
Output 1.1.6. Access to agricultural Inputs for climate-resilient production improved							
1.1.6.1	**Increasing the use of agriculture inputs (at least 30% distributed to women headed households)**						
	Mobilize farmers to use agriculture inputs	Number	1,100,000	1,150,000	1,200,000	1,350,000	1,400,000
	Establish farm services centres	Number	6	8	10	15	20
	Distribute and use of improved seed	MT	7,954	8,351	8,769	9,207	9,668
	Distribute and use of mineral fertilisers	MT	101,191	106,250	111,563	117,141	122,998
	Produce organic fertilisers	MT	8,500,000	9,800,750	10,345,986	11,453,210	15,234,143
	Distribute and use of lime	MT	15,649	17,213	18,935	20,828	22,911
	Produce Bio fertilizers	MT	2,000	2,500	3,000	3,500	4,500
1.1.6.2	**Boosting local production of organic and inorganic fertilizers**						
	Establish a manufacturing mineral fertilizer plant	Number			1		
	Establish organic fertilizer production factory	Number	2	2	2	2	2
1.1.6.3	**Promotion of local seed production**						
	1. **Support the production of plantlets and mini-tubers seeds for potato crop**						
	Plantlets	Number	2,600,000	2,730,000	2,866,500	3,009,825	3,160,316

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/ 29
	Mini-tubers	Number	4,600,000	4,830,000	5,071,500	5,325,075	5,591,329
	2. **Support the production of pre-basic seeds**						
	Hybrid Maize seeds	MT	4	4.4	4.8	5.3	5.9
	Beans	MT	4.5	5	5.4	6.0	6.6
	Soybean	MT	3.5	3.9	4.2	4.7	5.1
	Wheat	MT	2.0	2.2	2.4	2.7	2.9
	Irish potato	MT	500	550	605	665.5	732.1
	3. **Support to basic seed production**						
	Maize Hybrid	MT	62	68.2	75	82.5	90.8
	Wheat	MT	40	44	48.4	53.2	58.6
	Rice	MT	15	16.5	18.2	20	22
	Beans	MT	46	50.6	55.7	61.2	67.3
	Soybean	MT	32	35.2	38.7	42.6	46.9
	Irish potato	MT	3,500	3,850	4,235	4,658.5	5,124.4
	Banana	Number	7,000	7,700	8,470	9,317	10,249
	Nightshade	KG	20	22	24.2	26.6	29.3
	Spider plant	KG	20	22	24.2	26.6	29.3
	Avocado	Number	20,476,700	22,524,370	24,776,807	27,254,488	29,979,936
	Mango	Number	3,553,600	3,908,960	4,299,856	4,729,842	5,202,826
	Citrus	Number	1,137,500	1,251,250	1,376,375	1,514,013	1,665,414
	Apple	Number	849,700	934,670	1,028,137	1,130,951	1,244,046
	4. **Support the production of certified seed**						
	Hybrid Maize	MT	5,400	5,940	6,534	7,187	7,906
	Soybean	MT	300	330	363	399	439

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/29
	Wheat	MT	460	506	557	612	673
	Irish potato	MT	10,000	11,000	12,100	13,310	14,641
	Beans	MT	350	385	424	466	512
	Rice	MT	660	726	799	878	966
	5. **QDS (Quality Declared Seeds)**						
	Irish potato	MT	25,000	27,500	30,250	33,275	36,603
	Cassava	Number	120,000,000	132,000,000	145,200,000	159,720,000	175,692,000
	Nightshade	KG	20	22	24	27	29
	Spider plant	KG	15	17	18	20	22
	Tree tomato	KG	5	6	6	7	7
	Passion fruit	KG	20	22	24	27	29
	Apple scions	Number	284,000	312,400	343,640	378,004	415,804
	Avocado scions	Number	280,000	308,000	338,800	372,680	409,948
	Mango scions	Number	266,000	292,600	321,860	354,046	389,451
	Citrus scions	Number	122,000	134,200	147,620	162,382	178,620
1.1.6.4	**Enhance infrastructure and equipment for seed production**						
	Acquisition and rehabilitation of screen houses and seed storage facilities	Number	6	8	9	10	12
	Acquisition and maintenance of seed production and processing equipment	Number	2	2	4	5	6
	Improve and maintain seed production sites with water supply (irrigation)	Ha	26	30	35	40	45
Output 1.1.7. Plant health management enhanced							
1.1.7.1	**Sustainable plant health protection**						
	Conduct Pest and disease surveillance per season	Number (report)	3	3	3	3	3
	Upgrade existing plant clinics and create new ones linked to Food Basket Sites and AgriHubs	Number	150	250	350	400	500

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/ 29
	Organize Plant health campaigns per season	Number	3	3	3	3	3
	Train farmers on IPM	Number	1	1	1	1	1
	Disseminate information on pest and disease forecast	Number (report)	3	3	3	3	3
	Train farmers in safe pesticides use, handling and disposal	Number	10,920	11,500	12,780	13,932	15,000
	Support Private service providers for pest and diseases control	Number		450	600	800	1,000
	Increase area covered by Pest management Practices	Ha	550,000	650,000	780,920	802,450	877,500
	Inspect planting materials	Number	10,000	10,000	10,000	10,000	10,000
Output 1.1.8. Mechanization and labour-saving technologies promoted							
1.1.8.1	**Increase the adoption of mechanization**						
	Operationalize the Centre of Excellence for mechanization	Number (Report)	1	1	1	1	1
	Develop prototypes of suitable farm machinery	Number	4	4	4	4	44
	Set up and facilitate private service providers in mechanization (tillage, drying, shelling,)	Number	10	15	20	25	30
OUTCOME 1.2 MODERNIZED ANIMAL RESOURCES PRODUCTION AND PRODUCTIVITY							
Output 1.2.1. Animal husbandry and infrastructure in animal hubs improved							
1.2.1.1	**Animal resources infrastructures**						
	Establish animal resources production hubs (meat, dairy, eggs & fish)	Number (cumulative)	35	40	43	45	50
	Improve livestock sheds for zero-grazing policy	Number	2,200	2,300	2,300	2,300	2,300
	Develop and disseminate construction standards on animal shed	Standards	1	1	1	1	1
	Construct boreholes	Number	20	25	25	25	30
	Rehabilitate valley dams	Number	5	5	5	5	5

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/29
	Support households with small-scale water harvesting facilities	Number	15,000	20,000	25,000	30,000	35,000
	Construct modern livestock market	Number	1	1	1	1	1
Output 1.2.2. Sustainable animal breeding established							
1.2.2.1	**Genetic Improvement**						
	Establish Centre of excellence for animal genetics	Number			1		
	Establish breeding centres for cattle breed	Number		1		1	
	Establish breeding centres for pig breed	Number	1		1		
	Establish breeding centres for goat breed	Number	1		1		1
	Establish breeding centres for sheep breed	Number		1		1	
	Establish breeding centres for rabbit breeds	Number		1		1	
	Establish breeding centres for layer breed	Number	1		1	1	
	Establish breeding centres for broiler breed	Number	1		1		1
	Establish breeding centres for dual purpose Poultry breeds	Number			1		1
	Introduce improved breeds bulls for dairy cattle	Number	4	6		6	-
	Introduce improved breeds bulls for beef	Number	2	2		2	-
	Introduce improved breeds for pig (boar and gilts)	Number	0	14	28		-
	Introduce improved breeds for goat	Number of parents	0	30	0	40	0
	Introduce improved breeds for sheep	Number of parents	0	15	0	20	0
	Introduce improved breeds for poultry	Number of parents	100	200	300	400	0
	Introduce improved breeds for rabbits	Number of parents	100	100	100	100	0
	Certify hatcheries for Poultry	Number			1		1
	Establish LN2 plants and near animal hubs to ease logistic for AI provision	Number		1		1	1

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/29
	Create comprehensive legal framework for animal breeding and genetic management	Number		1			
	Create electronic herd/flock book system	Number			1		
Output 1.2.3. Access to animal feed improved							
1.2.3.1	**Animal feeding**						
	Increase area under improved forage	Ha	12,000	12,500	13,000	14,000	15,300
	Increase local animal feeds production from factories	MT	89,481	103,955	120,770	140,305	163,000
	Support Farmer organisations with equipment and training for feed production	Number	37	50	50	50	50
	Support forage seed multipliers including climate seed varieties	Number	126	156	186	216	246
	Increase access to Machinery used in fodder harvesting and processing	Number	50	100	115	200	250
Output 1.2.4. Animal health systems strengthened							
1.2.4.1	**Animal health**						
	Establish and strengthen the national epidemic surveillance programme	Number (Report)	2	2	2	2	2
	Establish and operationalize veterinary clinics	Number	96	176	256	336	416
	Increase proximity to private veterinary services providers	Number	14,216	14,623	15,034	15,448	15,864
	Implement Veterinary Sanitary Mandate (VSM)	Number (report)	4	4	4	4	4
	Vaccinate cattle	Number	999,150	1,006,552	1,021,354	1,031,222	1,088,245
	Vaccinate goats	Number	1,415,223	1,824,757	2,085,436	2,085,436	2,215,776
	Vaccinate sheep	Number	337,926	442,224	505,398	505,398	536,986
	Vaccinate pig	Number	727,752	808,614	875,998	1,145,536	1,583,535
	Vaccinate rabbit	Number	38,650	85,225	271,799	376,980	483,587
	Vaccinate poultry	Number	3,174,788	3,999,632	4,899,549	5,881,059	6,565,307

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/29
Output 1.2.5. Fisheries and aquaculture developed							
1.2.5.1	**Fish production**						
	Establish the national aquaculture research centre	Number		1			
	Conduct capacity building of fishers, fish farmers and other value chain actors	Number	1,200	1,500	1,700	1,800	2,000
	Establish FFS in fish industry	Number	30	30	30	30	30
	Establish and operationalize hatcheries	Number	13	14	15	16	17
	Produce fingerlings for aquaculture	Number	20,000,000	26,000,000	36,000,000	46,000,000	58,000,000
	Establish aquaparks	Number	7	8	9	10	11
Output 1.2.6. Beekeeping developed							
1.2.6.1	**Honey production**						
	Establish bee queen rearing centres	Number		1	1	1	
	Build capacities of Beekeepers	Number	1,000	1,000	1,000	1,000	1,000
	Increase the number of improved bee colonies in modern hives	Number	670,000	685,000	690,000	695,000	700,000
	Increase the quantity of melliferous plants and pollinator friendly plants around apiaries	Number	150,000	200,000	250,000	300,000	400,000
	Establish bee reserves (Nyungwe, Gishwati, Mukura, Virunga National Park and Akagera National Park and Ruhande/Arboretum)	Number (bee reserves)	1	1	1	1	1

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/29
PRIORITY AREA 2: INCLUSIVE MARKETS AND POST-HARVEST MANAGEMENT FOR SUSTAINABLE AGRI-FOOD SYSTEMS							
OUTCOME 2.1 BOOSTED AGRICULTURE EXPORTS							
Output 2.1.1. Export crops expanded							
2.1.1.1	**Increase the area under export crop production within AgriHubs**						
	Increase the area under coffee production	Ha	500	500	500	500	500
	Increase the area under tea production	Ha	1,667	1,667	1,667	1,667	1,667
	Increase the area under pyrethrum area	Ha	155	155	155	155	155
	Increase the area for different plant/crops that produce essential oils	Ha	322	323	322	322	323
	Increase the area under French beans production	Ha	15	16	18	20	22
	Increase the area under chili production (including those produced under protected agriculture systems)	Ha	227	322	460	654	933
	Increase the area under avocado production	Ha	23	79	88	87	87
	Increase the area under passion fruit production	Ha	1	4	4	4	5
	Increase the area under macadamia production	Ha	54	48	85	53	89
	Increase the area under flowers production	Ha	13	9	8	9	9
2.1.1.2	**Increase Export crops production**						
	Increase coffee production	MT	21,386.9	23,328	25,920	28,800	32,000
	Increase tea production	MT	41,500	42,719	47,466	52,740	58,600
	Increase pyrethrum production	MT	35	45	58	76	99
	Increase vegetables production	MT	67,197	87,356	113,563	147,632	191,921
	Increase fruits production	MT	26,344	31,612	37,935	45,522	54,626

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/29
	Increase flowers production	MT	931	1,024	1,126	1,239	1,362
2.1.1.3	**Operationalization of specialised AgriHubs Export handling facilities**						
	Increase cold-chain facilities	Number	2	2	2	2	2
	Establish a traceability system in export value chains	Number	0	0	1	0	0
	Adopt third party certified products and systems	Number	10	10	10	10	10
2.1.1.4	**Unlock growth in export value chains to diversify exports**						
	Identify potential markets for diversified export products	Number	4	4	4	4	4
	Conduct market intelligence studies	Number	4	4	4	4	4
	Penetrate identified markets	Number	1	2	2	3	3
Output 2.1.2. Rwandan agri- exports de-commoditized							
2.1.2.1	**Enhance the market share and public diplomacy**						
	Organise trade events through economic diplomacy	Number	10	10	10	10	10
	Organise exhibitions and trade show at local, regional and international level	Number	100	100	100	100	100
	Initiate and sign direct supply agreements and protocols in high-value markets	Number	5	5	5	5	5
	Organise branding campaigns for Rwandan products	Number	4	4	4	4	4
2.1.2.2	**Strengthening home market for export products**						
	Organize Local campaigns for home consumption and agri-tourism	Number	4	4	4	4	4
	Establish Facilities for exporting and domestic value addition	Number	5	5	10	10	10
2.1.2.3	**Revamp agri- export facilities for value addition and diversification**						
	Establish and upgrade agriculture export facilities (horticulture)	Number		1		1	

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/ 29
	Establish and Upgrade handling facility (tea, coffee)	Number		1	2		
	Establish and upgrade quality-testing facilities	Number	1	1	1	1	1
OUTCOME 2.2. STRENGTHENED MARKET LINKAGES AND POST-HARVEST INFRASTRUCTURE							
Output 2.2.1. Organisation models of farmers and value chain actors improved							
2.2.1.1	**Cooperatives in AgriHubs**						
	Support cooperatives working in AgriHubs scheme	Number	30	30	60	80	80
	Support Women and youth led-cooperatives	Number	15	15	30	40	40
	Develop comprehensive training module on governance and management	Number	1	1	1	1	1
	Conduct training sessions per cooperative	Number	16	16	16	16	16
	Establish and coordinate new value chain platforms	Number	5	7	7	7	8
	Strengthen market linkages through contract farming	Contracts	3	3	3	3	3
Output 2.2.2. Post-harvest handling for reduced losses improved							
2.2.2.1	**Post-harvest management**						
	Establish community-based facilities for post-harvest handling and local value addition, driven by private sector engagement	Community-based facilities	2	2	2	2	2
	Enhance skills in post-harvest management	Trained farmers	17,150	19,230	22,500	25,789	30,127
	Construct Animal feeds factories (including fish feeds industry)	Number		2	1	1	1
	Foster public-private partnerships to establish large-scale impact initiatives for post-harvest handling	Number	2	2	3	4	5

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/ 29
	Develop and implement private sector-led facilities and services aimed at enhancing market linkages for post-harvest handling	Number	1	1	1	1	1
	Establish and upgrade milk collection centres (MCCs) to streamline milk supply to the market	Number	2	18	34	3	2
	Establish milk collection points (MCPs)	Number	4	4	4	4	4
	Establish and upgrade Cold storage facilities	Number	5	5	5	5	10
	Increase the storage capacity of animal feeds	Number (cumulative)	2	3	4	7	9
	Strengthen MCCs as a hub to improve supply and milk collection	Number		5	10	15	20
	Construct Landing sites (fish)	Number	5	5	5	3	3
	Construct Fish Drying flakes (small fish)	Number	4	4	3	3	1
	Establish Smoking areas (fish)	Number	1		1		1
	Purchase Mobile dryers for cereals	Number	8	20	20	20	25
	Construct collection centres (Irish potato, cassava, vegetables, honey and eggs etc..)	Number	12	5	5	5	5
	Construct food crop storage facilities (silos and warehouses)	Number	5	5	5	5	5
	Construct drying grounds (rice and wheat)	Number	10	40	52	48	30
	Construct drying shelters (maize and beans)	Number	25	55	65	60	50
	Procure appropriate packaging materials	Number	750	800	1,000	1,500	2,000

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/29
Output 2.2.3. Agriculture commodity safety and quality Increased							
2.2.3.1	**Agriculture testing facilities**						
	Upgrade testing facilities for safety and quality parameters	Number	1		2		1
	Establish a traceability system	Number		1			
Output 2.2.4. Value addition increased							
2.2.4.1	**Facilities for value addition**						
	Establish and upgrade small livestock slaughter slabs	Number	20	25	30	30	35
	Establish and upgrade dairy processing facilities	Number	3	3	3	3	3
	Establish and upgrade local wholegrain flour mills	Number	3	3	3	3	3
	Provide technical assistance to business operators in standardisation	Number	65	80	90	100	120
Output 2.2.5. Trade infrastructures improved							
2.2.5.1	**Aggregation and markets facilities**						
	Establish Kigali wholesale market	Number			1		
	Strengthen animal and livestock markets	Number	11	12	13	14	15
	Conduct need assessment for infrastructures needs (feeder roads, water and electricity)	Number	1	1	1	1	1
	Develop protocols for trade facilities	Number	1	1	1	1	1
OUTCOME 2.3 IMPROVED FOOD SECURITY AND NUTRITION							
Output 2.3.1. Food security and nutrition improved							
2.3.1.1	**Nutrition sensitive Agriculture**						
	Facilitate the establishment of schools' orchards and gardens	Number	2,000	2,000	2,000	2,000	2,000
2.3.1.2	**Produce biofortified seeds**						

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/29
	Beans	MT	3,500	4,000	4,500	5,000	5,500
	Sweet potato	Cuttings	3,000	3,000	3,000	3,000	3,000
	Cassava	Cuttings	4,000	4,000	4,000	4,000	4,000
	Mushrooms	MT	50	70	80	100	120
	Potato	MT	5,000	5,500	6,000	6,500	7,000
	Develop and disseminate Food-Based Dietary Guidelines (FBDGs)	Number	13,500	16,000	20,000	25,800	30,000
	Outreach campaigns for nutrition sensitive agriculture mainstreaming guidelines	Number		4	4	4	4
Output 2.3.2. Households supported with animal resources production and nutrition sensitive crop production (at least 30% distributed to women headed households)							
2.3.2.1	**Distribution of animal resources and vegetable seeds to families**						
	Cows under Girinka program	Number	25,000	28,000	30,000	33,000	35,000
	Vegetable seeds for kitchen garden	MT	1	1	1	1	1
	Goats	Number	18,630	20,436	22,500	25,785	30,890
	Pigs	Number	12,500	14,680	17,320	18,500	20,700
	Sheep	Number	7,425	9,800	11,908	13,769	15,740
	Fruits trees	Number	140,000	150,000	200,000	220,000	250,000
	Rabbit	Number	1,500	2,000	3,000	4,000	5,000
	Poultry	Number	143,720	145,600	147,890	150,000	160,000
Output 2.3.3. Food stability and mitigating related shocks ensured							
2.3.3.1	**Increase national storage grain reserves**						
	National storage capacity of food crops (cumulative)	MT	330,025	345,025	365,025	390,025	420,025
	Grain storage capacity (silos) for animal feeds	MT	15,000	20,000	25,000	30,000	35,000

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/29
	Food stored as strategic reserve	MT	31,678	32,150	35,000	37,500	43,000
	Maize	MT	16,478	16,000	17,500	18,500	20,000
	Beans	MT	11,200	11,500	12,000	12,500	15,000
	Rice	MT	2,500	3,000	3,500	4,000	5,000
	Soya	MT	1,500	1,650	2,000	2,500	3,000
PRIORITY AREA 3: STRENGTHENING AGRI-FOOD SYSTEMS ENABLERS FOR EFFECTIVE AND EFFICIENT DELIVERY							
OUTCOME 3.1 STRENGTHENED RESEARCH AND TECHNOLOGY TRANSFER FOR AGRI-FOOD SYSTEMS							
Output 3.1.1. Demand-driven research enhanced							
3.1.1.1	**Develop climate resilient and disease resistant varieties**						
	Maize	Number	0	2	0	2	0
	Rice	Number	1	0	1	0	1
	Wheat	Number	7	0	3	1	1
	Cassava	Number	0	2	0	1	0
	Irish potato	Number	1	0	3	0	0
	Sweet potato	Number	1	0	0	3	0
	Beans	Number	0	0	3	0	0
	Soybean	Number	0	0	3	0	0
	Banana	Number	0	0	1	0	0
	Horticulture (fruits)	Number	0	1	1	2	2
	Coffee	Number	3	0	3	0	3
	Tea	Number	3	0	3	0	3
	Pyrethrum	Number	3	0	3	0	3

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/ 29
	Develop protocols for in-vitro production of clean (disease-free) planting materials	Number	1	1	1	1	1
3.1.1.1.2	**Develop new animal breeds**						
	Introduce goat breed	Number	1	1	1	1	1
	Introduce sheep breed	Number	0	1	0	1	0
	Introduce pig breeds	Number	1	1	1	1	1
	Introduce layer poultry breeds	Number	0	0	1	0	0
	Introduce broiler poultry breeds	Number	0	0	0	1	1
	Introduce dual poultry breeds	Number	0	1	0	0	1
	Introduce new dairy breeds	Number	0	1	1	1	1
	Introduce new beef breeds	Number	1	2	2	2	2
	Introduce rabbits breed	Number	2	2	4	4	4
	Produce research products in bee genetics	Number	1	1	1	1	1
3.1.1.1.3	**Develop new production technologies**						
	Conduct study on the adoption of modern technologies and climate resilient practices	Number		1			1
	Upgrade research stations	Number	2	2	2	2	2
	Develop confined facilities	Number	0	0	1	0	0
	Establish screen house facilities	Number	2	2	2	2	2
	Construction of greenhouse facilities	Number	2	2	2	2	2
	Develop databases for national soil and crop information system	Number	0	1	0	0	0
	Develop crop suitability maps	Number	0	1	0	1	0
	Develop integrated soil fertility management technologies	Number	1	1	1	1	1
	Produce fertilizer recommendations per crop	Number	3	3		3	3
	Conduct soil sampling and testing	Ha	84,060	99,560	115,060	130,560	146,060

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/ 29
	Develop new bio-fertilizer technologies	Number	0	1	0	1	0
	Develop biotechnology products (genetically modified products & protocols)	Number	0	1	1	1	1
	Develop improved manure management technologies	Number	0	1	1	0	2
	Develop animal feed technologies	Number	2	1	3	2	2
	Develop crop management technologies	Number	2	2	2	2	2
	Develop efficient water use technologies	Number	0	1	0	1	0
	Develop climate smart techniques	Number	0	1	1	1	1
	Develop diagnostic tools for quick detection of major diseases	Number	1	1	1	1	1
	Develop new pest/disease control and IPM packages for crops	Number	2	4	2	4	2
	Conduct pest and disease surveillance	Number (per season)	2	2	2	2	2
3.1.1.1.4	**Develop post-harvest technologies**						
	Develop technologies for value addition	Number	1	0	1	0	1
	Develop technologies for post-harvest handling	Number	0	1	0	1	0
	Develop food waste management technologies	Number	0	0	1	0	0
3.1.1.1.5	**Conservation of genetic resources**						
	Conserve Local cattle breeds	Number	0	0	1	0	1
	Characterize and conserve Local poultry breeds	Number	0	0	1	0	1
	Upgrade the National Genebank	Number (Report)	0	0	1	0	0
	Establish of National Collection of Microbial Genetic Resources	Number of accessions	1	1	1	1	1
	Collect, characterise and conserve plant genetic resources	Number	230	230	230	230	230
	Collect, characterise and conserve forage genetic resources	Number	20	20	20	20	20
	Collect, characterise and conserve local animal genetic resources	Number	60	60	60	60	60

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/ 29
3.1.1.1.6	**Promotion of private - led research**						
	Acquire patents from researchers on new technologies	Number	5	5	5	5	5
	Develop new technologies in partnership with the private sector	Number		2	3	4	5
	Organize and coordinate research day	Number		1		1	1
Output 3.1.2. Customised Agriculture Extension System Enhanced							
3.1.2.1	**Customized extension packages in each value chains**						
	Profiling food crops value chains	Number	5				
	Profiling animal resources value chains	Number	4				
	Profiling horticulture value chains	Number	4				
	Develop customized extension package for each value chain	Number		14			
	Conduct a study on extension services providers in the country	Number	1				
	Certify extension professionals	Number		400	550	600	650
	Establish a digital system of professional licensed extension providers	Number		1			
3.1.2.2	**Capacity development and quality certification**						
	Conduct need assessment for extension services providers in prioritized value chains	Number (Need assessment)	1				
	Train Master trainers on specific value chain	Number	250	250	250	250	250
	Train Front-line extension agents (such as FFS facilitators, FPs) on the delivery of new extension packages	Number	17,000	17,000	17,500	18,500	21,620
	Establish L-FFS groups by L-FFS Facilitators	Number	600	600	600	600	600
	Establish FFS on fish farming	Number	30	30	30	30	30
	Train aquaculture and fisheries master trainers	Number	100	100	100	100	100

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/ 29
	Establish Livestock Farmer Field Schools	Number	800	1,200	1,200	1,200	1,200
	Organize Livestock Farmer Field School (L-FFS)) that provides Extension Advisory Services (TWIGIRE MWOROZI)	Number	4,946	4,946	4,946	4,946	4,946
	Support Farmer Promoters with basic package	Number	15,000	15,000	15,000	15,000	15,000
	Support Crop FFS Facilitators	Number	2,600	2,600	2,600	2,600	2,600
	Support Livestock Farmer Field School (L-FFS) Facilitators	Number	4,946	4,946	4,946	4,946	4,946
	Establish demonstration plots	Number	29,000	29,000	29,000	29,000	29,000
3.1.2.3	**Strengthen partnership between private sector, government, and knowledge institutions**						
	Establish platforms of extension providers and scientists to identify research and capacity needs	Meetings	4	4	4	4	4
	Develop research and capacity building agenda for centres of excellence	Number	8	8	8	8	8
Output 3.1.3. Technical capacity, education, and skills developed							
3.1.3.1	**Enhance knowledge and skills in agriculture related interventions**						
	Train youth and professional farmers on technical courses by education institutions and other relevant specialised institutions	Number	450	650	850	1,050	1,250
	Organize long term training in Agri-food systems (Masters & PhDs)	Number	8	8	8	8	8
	Organize on-job specialised and professional short courses in the Agri-food systems	Number	50	50	50	50	50
	Undertake curricula review in collaboration with relevant specialised institutions	Number	1	1	1	1	1
	Upgrade schools with facilities to train in Agri-food related disciplines	Number	5	5	5	5	5
	Upscale industrial attachment programs to private sector (50% women)	Number of students	500	1000	2000	3000	4000
	Provide Youth with training, mentorship, and start-up packages (50 % women)	Number	500	500	500	500	500

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/29
OUTCOME 3.2 STRENGTHENED AGRICULTURE DE-RISKING FOR RESILIENCE							
Output 3.2.1. Access to Agriculture Finance increased							
3.2.1.1	**De-risking facility**			1	1	1	1
	Establish credit guarantee facility	Number		1	1	1	1
	Establish grant facility for infrastructure development	Number		1	1	1	1
	Establish grant facility for market linkages and technology development	Number		1	1	1	1
	Develop agri-finance products	Number	5	5	5	5	5
	Digital farmer profiles and transaction histories stored		50,000	100,000	200,000	300,000	500,000
	Conduct financial literacy campaigns targeting farmers and other relevant stakeholders	Number	15	23	27	30	30
Output 3.2.2. Agriculture Insurance Scheme strengthened							
3.2.2.1	**Crop and Animal resource insurance**						
	Develop and operationalize guidelines for insurance products	Number	1	1	1	1	1
	Insure area under rice	Ha	23,826	23,926	24,026	24,126	24,226
	Insure area under maize	Ha	9,519	11,105	12,692	14,278	15,865
	Insure area under Irish Potatoes	Ha	2,662	4,249	5,835	7,421	9,008
	Insure area under soya bean	Ha	1,809	3,396	4,982	6,568	8,155
	Insure area under beans	Ha	1,802	3,388	4,975	6,561	8,148
	Insure area under cassava	Ha	1,586	3,173	4,759	6,346	7,932
	Insure area under chilli	Ha	340	578	816	1,054	1,292
	Insure area under French beans	Ha	263	501	739	977	1,215
	Insure cattle	Number	49,962	51,462	53,462	55,962	58,962
	Insure pig	Number	27,300	52,300	82,300	117,300	157,300

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/ 29
	Insure poultry	Number	294,506	324,506	364,506	414,506	474,506
	Insure fishponds/farms	Number	5,200	9,900	16,100	24,650	35,000
	Insure rabbits	Number	426,499	541,326	629,907	1,104,634	1,189,606
	Train professionals (public & Private) on agriculture insurance	Number	4,054	4,729	5,405	6,080	6,756
OUTCOME 3.3. DIGITISED AGRI-FOOD SYSTEMS							
Output 3.3.1. Affordable digital technologies developed							
3.3.1.1	**Device access and connectivity**						
	Support farmers owning smartphones or other relevant devices through partnerships with telcos	Number	200,000	500,000	500,000	500,000	500,000
	Subsidize agriculture services on digital transaction fees	Number	2	2	2	2	2
	Build and maintain the Agricultural Management Information System (AMIS)	Number	1	1	1	1	1
	Host agriculture services in the data centre (OCI)	Number	0	1	1	5	10
Output 3.3.2. Data governance enhanced							
3.3.2.1	**Agriculture data management**						
	Develop data Strategy and governance framework	Number		1			
	Increase innovative technologies and methods such as crowdsourcing, camera-equipped drones, and high-resolution satellite imagery to gather data more efficiently and timely	Number	100,000	200,000	300,000	400,000	500,000
	Mobilize new data collection agents and farmer promoters including youth onboarded to support quality data collection through GOR and private sector	Number	5,000	7,000	9,000	10,000	15000
	Develop Integrated decision support dashboards	Number	1	1	1	2	1

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/ 29
Output 3.3.3. Digital innovation in agriculture value chains promoted							
3.3.3.1	**Agritech innovation pipeline**						
	Digitize and operationalize agriculture services	Number	5	10	10	20	30
	Digitalize value chains systems	Number	5	5	5	5	5
	Facilitate farmers and traders to access local and international markets through e-commerce	Number	2,000	3,000	5,000	10,000	20,000
	Register of farmers & livestock through Agriculture Management Information System (AMIS)	Number of farmers registered in AMIS	100,000	500,000	700,000	700,000	700,000
Output 3.3.4. Digital competencies developed							
3.3.4.1	**Enhance digital literacy**						
	Train digital ambassadors, farmer promoters, extension workers, and village elders in digital literacy	Number	-	5,000	10,000	15,000	20,000
	Train Farmers in digital literacy and using digital services	Number	20,000	50,000	100,000	2,000,000	3,000,000
	Establish youth led hanga-hubs	Number of youths	-	5,000	10,000	15,000	20,000
	Develop value chain digital literacy modules	Number	5	7	9	11	
Output 3.3.5. Sustainable business models for digital systems and platforms developed							
3.3.5.1	**Upgrade and develop digital systems**						
	Develop and implement a digital financial strategy /framework for agriculture, aiming to increase the percentage of farmers utilizing mobile banking, wallets, and credit platforms	Number	0	1			
	Initiate business models for digital platforms	Number	0	1	1		1
	Mobilize investors through public-private partnerships in digital agriculture projects within a defined timeframe	Number	1	2	4	6	8

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/ 29
	Mobilize technical experts to support implementation of development partner funded projects implementation	Number	5	10	15	20	25
Output 3.3.6. Digitalization networking strengthened							
3.3.6.1	**Reinforce coordination for agriculture digitalization**						
	Establish the digital agriculture technical working group	Number	1	1	1	1	1
	Establish National digital agriculture task force	Number	1	1	1	1	1
OUTCOME 3.4 STRENGTHENED AGRI-FOOD SYSTEMS PLANNING AND COORDINATION							
Output 3.4.1. Capacity for planning and knowledge management enhanced							
3.4.1.1	**Strengthen public sector capacity to design impactful programs**						
	Establish a programme designing Unit	Number	1	1	1	1	1
	Design programmes	Number	6	2	2	2	2
	Develop projects designed as PPP, public, or private prepared and funded	Number	30	35	35	35	40
	Train staff in food systems management	Number	30	30	30	30	30
	Train staff in core and emerging topics	Number	15	15	15	15	15
Output 3.4.2. Agri-food systems coordination and value chains developed							
3.4.2.1	**Coordination for Agri-food system stakeholders**						
	Design business plans for value chain development packaged for entrepreneurs	Number	8	8	8	8	8
	Establish value chain platforms	Number	7	8	10	12	15
	Establish transparent governance structure for agri-PPDs	Number	1	1	1	1	1
	Organize meetings with regional value chain platforms to establish linkages	Number	3	3	3	3	3
Output 3.4.3. Policy and regulatory reform for an enabling environment reviewed							
3.4.3.1	**Review policy and strategic documents**						
	Set-up a taskforce to review regulatory bottlenecks	Number	1	1	1	1	1
	Review regulatory bottlenecks	Number (report)	1	1	1	1	1

Nº	Item Description	Unit	2024/25	2025/26	2026/27	2027/28	2028/29
	Organize a stakeholder consultation on regulatory review needs conducted	Number	4	4	4	4	4
Output 3.4.4. Institutional reforms for effective implementation enhanced							
3.4.4.1	**Modernize institutional framework**						
	Conduct institutional review in light of PSTA 5	Number (report)	1				
	Undertake institutional restructuring based on the review	Number (report)		1			
	Establish National CAES Secretariat	Number	1				
	Establish Rwanda forum for agricultural extension and advisory service professionals	Number		3	3	3	3
	Establish Food Systems coordination unit	Number	1	1	1	1	1
	Introduce improved digital processes and systems for more efficient food systems planning	Number		1	1	1	1

ANNEX 3: BUDGET FRAMEWORK

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
Total Budget for PSTA 5						**1,071,578**	**1,134,955**	**1,420,956**	**1,343,034**	**1,435,934**	**6,406,457.4**
PRIORITY AREA ONE: MODERNIZATION OF AGRICULTURE AND ANIMAL RESOURCES PRODUCTION FOR CLIMATE -RESILIENT AGRIFOOD SYSTEMS						**640,492.9**	**694,215.3**	**772,736.7**	**807,233.9**	**838,819.7**	**3,753,498.6**
	OUTCOME 1.1 MODERNIZED CROP PRODUCTION AND PRODUCTIVITY					**418,451.8**	**446,503.3**	**497,099.1**	**529,054.1**	**539,704.1**	**2,430,812.4**
		Output 1.1.1 Agricultural land management and production models improved				**3,265.0**	**5,975.1**	**3,631.3**	**3,602.3**	**3,806.8**	**20,280.6**
			1.1.1.1. Agriculture Land-use Masterplan			**-**	**2,504.8**	**110.0**	**-**	**-**	**2,614.8**
				Develop Agriculture Land-use Masterplan (LUMP)	Masterplan	-	2,187.0	-	-	-	2,187.0
				Produce regulations and guidelines for land lease and contract farming	Guidelines & regulations	-	53.0	110.0	-	-	163.0

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Conduct consultative meetings with various stakeholders	Number	-	254.2	-	-	-	254.2
				Organize validation session of LUMP	Number	-	10.7	-	-	-	10.7
			Subtotal			-	2,504.8	110.0	-	-	2,614.8
			1.1.1.2. Operationalization of Food Basket Sites (FOBASI)			**3,162.6**	**3,310.2**	**3,435.0**	**3,602.3**	**3,806.8**	**17,316.9**
				Mapping Foodbasket sites per district per crop	Ha	182.0	240.5	356.8	463.1	577.1	1,819.6
				Establish guidelines for Food Basket Sites development	Number	25.5	-	-	-	29.6	55.1
				Organize mobilization meeting with farmers and leaders	Number	18.5	19.2	20.1	20.9	21.8	100.4
				Capacity building of cooperatives members in the Food Basket Sites (FOBASI)	Number	307.2	320.1	223.0	174.3	121.1	1,145.6
				Support FOBASI Cooperatives with professional managers	Number	1,100.7	1,142.9	1,186.8	1,232.4	1,279.8	5,942.6
				Train extension agents under FOBASI	Number	1,528.8	1,587.4	1,648.3	1,711.6	1,777.5	8,253.6
			Subtotal			3,162.6	3,310.2	3,435.0	3,602.3	3,806.8	17,316.9
			1.1.1.3. AgriHubs establishment			**102.4**	**160.2**	**86.3**	**-**	**-**	**348.8**
				Promote and operationalize Agri-Hubs	Ha	51.4	160.2	86.3	-	-	297.9
				Develop guidelines for Agri-hub	Guidelines	51.0	-	-	-	-	51.0
			Subtotal			102.4	160.2	86.3	-	-	348.8
		Output 1.1.2. Small-holder farmers supported for household resilience				**10,765.8**	**12,034.0**	**13,603.6**	**15,867.0**	**19,259.9**	**71,530.3**

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
			1.1.2.1. Support smallholders to create Food Basket Sites			**10,765.8**	**12,034.0**	**13,603.6**	**15,867.0**	**19,259.9**	**71,530.3**
				Facilitate access to land tenure and leasing arrangements	Number (Outreach staff)	1,834.5	1,904.9	1,978.0	2,054.0	2,132.9	9,904.3
				Support smallholder farmers with improved seeds (Maize)	Kg	3,868.0	4,252.6	5,190.6	5,792.2	6,711.1	25,814.5
				Support smallholder farmers with cuttings (cassava, sweet potatoes)	Cuttings	21.4	25.4	39.6	51.3	71.1	208.8
				Support smallholder farmers with fertilizers	MT	5,041.8	5,851.1	6,395.5	7,969.4	10,344.8	35,602.7
			Subtotal			10,765.8	12,034.0	13,603.6	15,867.0	19,259.9	71,530.3
		Output 1.1.3. Urban and peri-urban farming promoted				**4,436.5**	**12,843.8**	**8,062.1**	**9,381.2**	**11,459.5**	**46,183.1**
			1.1.3.1. Promotion of vertical farming (Kitchen garden, Aquaponic, Hydroponics,)			**1,328.0**	**8,173.3**	**1,995.0**	**2,363.9**	**2,758.1**	**16,618.3**
				Support the extension of the Horticulture center of excellence	Lumpsum	20.3	21.0	21.6	22.3	23.0	108.2
				Establish demonstration sites	Number	13.2	20.4	28.0	36.1	44.8	142.5
				Organize technology transfer exhibition	Number	20.5	21.4	22.3	23.2	24.2	111.6
				Distribute quality seedlings (Fruits) for urban agriculture	Seedlings	1,274.0	1,587.4	1,923.0	2,282.2	2,666.2	9,732.8
				Establish a plant for organic manure production from City waste	Number	-	6,523.2	-	-	-	6,523.2
			Subtotal			**1,328.0**	**8,173.3**	**1,995.0**	**2,363.9**	**2,758.1**	**16,618.3**
			1.1.3.2. Capacity building of Youth and Women groups in urban agriculture technologies and opportunities			**3,025.7**	**4,562.8**	**5,865.8**	**6,691.5**	**8,301.3**	**28,447.2**

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Support business plans for youth and women' cooperatives	Number	255.3	531.9	1,108.6	1,386.1	1,805.5	5,087.4
				Organize training for youth and women' cooperatives on urban farming	Number (Cooperatives)	2,565.3	3,742.2	4,456.4	4,933.8	6,048.3	21,746.0
				Mobilize farmers for high value crops	Number	102.6	128.3	133.7	139.3	145.2	649.1
				Link farmers with buyers through contract farming	Number	102.6	160.4	167.1	232.2	302.4	964.7
			Subtotal			3,025.7	4,562.8	5,865.8	6,691.5	8,301.3	28,447.2
			1.1.3.3. Agro-eco-tourism opportunities			**82.8**	**107.7**	**201.3**	**325.9**	**400.0**	**1,117.6**
				Identify agro-eco-tourism opportunities	Number (cumulative)	51.3	74.8	167.1	290.2	362.9	946.4
				Organize trainings on agro-eco-tourism	Number	11.0	11.4	11.9	12.4	12.9	59.7
				Conduct awareness campaigns on agro-eco-tourism	Number	20.5	21.4	22.3	23.2	24.2	111.6
			Subtotal			**82.8**	**107.7**	**201.3**	**325.9**	**400.0**	**1,117.6**
		Output 1.1.4. Climate-smart agriculture practices improved				**54,463.0**	**60,674.2**	**70,492.0**	**80,193.0**	**90,915.8**	**356,738.0**
			1.1.4.1. Soil erosion control			**27,577.3**	**31,587.8**	**39,123.1**	**46,333.4**	**54,398.6**	**199,020.2**
				Plantation of agro-forestry	Ha	2,749.7	3,709.1	5,003.3	6,749.4	9,105.3	27,316.7
				Develop radical terraces	Ha	14,865.7	15,608.7	19,054.7	21,750.2	24,622.5	95,901.9
				Develop progressive terraces	Ha	4,239.9	4,766.0	5,325.9	5,921.4	6,554.4	26,807.6
				Wooded Savannah / Shrub restoration	Ha	5,698.5	7,371.1	9,162.1	11,077.7	13,125.0	46,434.4
				Expand area under conservation agriculture	Ha	12.2	118.6	559.4	812.7	963.9	2,466.9
				Increase area under greenhouse	Ha	11.4	14.2	17.7	22.1	27.5	92.9

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
			Subtotal			27,577.3	31,587.8	39,123.1	46,333.4	54,398.6	199,020.2
			1.1.4.2. Climate smart information systems and advisory services			**26,885.7**	**29,086.4**	**31,368.8**	**33,859.6**	**36,517.2**	**157,717.8**
				Map hot spot in agriculture (risk zone)	Number (report)	51.3	53.5	-	-	-	104.8
				Organize training session	Number	94.1	100.4	107.0	123.9	154.9	580.2
				Train master trainer on climate smart agriculture	Number	26,678.7	28,868.4	31,195.0	33,666.1	36,289.7	156,698.0
				Operationalize crop monitoring system	Number	61.6	64.2	66.8	69.7	72.6	334.8
			Subtotal			26,885.7	29,086.4	31,368.8	33,859.6	36,517.2	157,717.8
		Output 1.1.5. Irrigation and water resource management improved				**134,563.4**	**155,834.1**	**161,731.4**	**185,297.6**	**156,192.7**	**793,619.2**
			1.1.5.1. Development and rehabilitation of Irrigation areas			**134,482.5**	**155,716.8**	**161,580.8**	**185,086.7**	**155,922.9**	**792,789.7**
				Marshlands	Ha	26,914.8	27,927.5	28,979.2	30,071.4	31,205.8	145,098.7
				Hillside irrigation	Ha	62,350.9	80,871.1	83,916.6	104,495.3	72,291.4	403,925.2
				Small-scale technologies	Ha	29,629.1	30,744.0	31,901.7	33,104.1	34,352.9	159,731.8
				Rehabilitate existing irrigation schemes	Ha	15,587.7	16,174.2	16,783.3	17,415.9	18,072.8	84,034.0
			Subtotal			**134,482.5**	**155,716.8**	**161,580.8**	**185,086.7**	**155,922.9**	**792,789.7**
			1.1.5.2. Management of Irrigation Water User Organizations (IWUOs)			**60.6**	**75.5**	**85.8**	**99.3**	**108.6**	**429.7**
				Support organization and registration of IWUOs	Number	-	-	-	-	-	-
				Train members of IWUOs and cooperatives managing irrigation schemes on proper water management /j	Number	60.6	75.5	85.8	99.3	108.6	429.7
			Subtotal			**60.6**	**75.5**	**85.8**	**99.3**	**108.6**	**429.7**

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
			1.1.5.3. Adoption of water saving technologies			**20.3**	**41.9**	**64.9**	**111.6**	**161.2**	**399.9**
				Pilot water saving technologies	Number	20.3	41.9	64.9	111.6	161.2	399.9
				Disseminate water saving technologies to users	Number	-	-	-	-	-	-
			Subtotal			**20.3**	**41.9**	**64.9**	**111.6**	**161.2**	**399.9**
		Output 1.1.6. Access to agricultural Inputs for climate-resilient production improved				**128,712.0**	**105,911.7**	**143,708.8**	**128,831.1**	**142,249.0**	**649,412.6**
			1.1.6.1. Increasing the use of agriculture inputs (at least 30% distributed to women headed households)			**99,030.2**	**72,628.6**	**79,433.8**	**86,890.5**	**95,062.7**	**433,045.7**
				Mobilize farmers to use agriculture inputs	Number	-	-	-	-	-	-
				Establish farm services centres	Number	-	-	-	-	-	-
				Distribute and use of improved seed	MT	2,407.6	2,634.2	2,882.0	3,153.2	3,449.9	14,526.9
				Distribute and use of mineral fertilisers	MT	60,021.9	65,440.4	71,350.0	77,795.5	84,825.5	359,433.2
				Produce organic fertilisers	MT	32,613.5	-	-	-	-	32,613.5
				Distribution and use of lime	MT	3,987.1	4,554.1	5,201.8	5,941.8	6,787.2	26,472.0
				Production of Bio fertilizers	MT	-	-	-	-	-	-
			Subtotal			**99,030.2**	**72,628.6**	**79,433.8**	**86,890.5**	**95,062.7**	**433,045.7**
			1.1.6.2. Boosting local production of organic and inorganic fertilizers			**6,322.6**	**6,523.2**	**33,651.1**	**6,944.0**	**7,164.6**	**60,605.5**
				Establish a manufacturing mineral fertilizer plant	Number	-	-	26,920.9	-	-	26,920.9
				Establish organic fertilizer production factory	Number	6,322.6	6,523.2	6,730.2	6,944.0	7,164.6	33,684.6
			Subtotal			**6,322.6**	**6,523.2**	**33,651.1**	**6,944.0**	**7,164.6**	**60,605.5**
			1.1.6.3. Promotion of Local Seed Production			**22,796.4**	**26,037.9**	**29,743.3**	**33,961.1**	**38,766.4**	**151,305.1**

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Hybrid Maize	MT	12,553.5	14,338.5	16,377.8	18,706.6	21,369.2	83,345.8
				Beans	MT	627.1	716.3	819.1	934.8	1,066.6	4,163.9
				Soybean	MT	458.6	523.8	598.3	682.9	780.3	3,044.1
				Wheat	MT	726.7	830.0	948.7	1,082.4	1,236.1	4,823.9
				Rice	MT	817.3	933.5	1,066.8	1,217.3	1,390.8	5,425.6
				Irish potato	MT	7,613.2	8,695.7	9,932.5	11,336.9	12,923.5	50,501.8
			Subtotal			**22,796.4**	**26,037.9**	**29,743.3**	**33,961.1**	**38,766.4**	**151,305.1**
			1.1.6.4. Enhance infrastructure and equipment for Seed Production			**562.9**	**722.0**	**880.6**	**1,035.6**	**1,255.3**	**4,456.3**
				Acquisition and rehabilitation of screen Houses and seed storage facilities	Number	280.6	388.2	453.1	522.5	650.6	2,295.0
				Acquisition and maintenance of seed production and processing equipment	Number	26.0	27.0	55.9	72.6	90.4	271.8
				Improve and maintain seed production sites with water supply (Irrigation)	Ha	256.3	306.9	371.5	440.6	514.3	1,889.5
			Subtotal			**562.9**	**722.0**	**880.6**	**1,035.6**	**1,255.3**	**4,456.3**
		Output 1.1.7. Plant Health Management enhanced				**81,728.1**	**92,452.9**	**94,775.1**	**104,488.3**	**114,149.9**	**487,594.3**
			1.1.7.1. Sustainable plant health protection			**81,728.1**	**92,452.9**	**94,775.1**	**104,488.3**	**114,149.9**	**487,594.3**
				Conduct pest and disease surveillance per season	Number (report)	152.9	158.9	165.0	171.5	178.1	826.4
				Upgrade existing plant clinics and create new ones linked to Food Basket Sites and Agrihubs	Number	4,587.4	4,765.6	-	-	-	9,353.0
				Organize plant health campaigns per season	Number	152.9	158.9	165.0	171.5	178.1	826.4
				Train farmers on IPM	Number	20,022.5	22,323.9	24,889.8	27,750.6	30,940.3	125,927.1

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Disseminate information on pest and disease forecast	Number (report)	275.2	285.9	297.1	308.6	320.6	1,487.5
				Train farmers in safe pesticides use, handling and disposal	Number	5,566.0	6,089.4	6,326.2	7,962.3	8,906.4	34,850.3
				Support private service providers for pest and diseases control	Number	-	5,718.8	7,921.5	10,973.0	14,250.3	38,863.5
				Inspect planting materials	Number	50,971.1	52,951.6	55,010.5	57,150.9	59,376.1	275,460.1
			Subtotal			**81,728.1**	**92,452.9**	**94,775.1**	**104,488.3**	**114,149.9**	**487,594.3**
		Output 1.1.8. Mechanization and labour-saving technologies promoted				**518.1**	**777.4**	**1,094.8**	**1,393.6**	**1,670.5**	**5,454.4**
			1.1.8.1. Increase the adoption of mechanization			**518.1**	**777.4**	**1,094.8**	**1,393.6**	**1,670.5**	**5,454.4**
				Operationalize the centre of excellence for mechanization	Number (Report)	10.2	10.5	10.8	11.2	11.5	54.1
				Develop prototypes of suitable farm machinery	Number	406.3	419.2	432.5	446.3	460.5	2,164.8
				Set up and facilitate private service providers in mechanization (Tillage, drying, shelling,)	Number	101.6	157.2	216.3	278.9	345.3	1,099.3
				Management support for operations	Number (reports)	-	190.5	435.2	657.3	853.2	2,136.1
			Subtotal			**518.1**	**777.4**	**1,094.8**	**1,393.6**	**1,670.5**	**5,454.4**
	OUTCOME 1.2 MODERNIZED ANIMAL RESOURCES PRODUCTION AND PRODUCTIVITY					**222,041.2**	**247,712.0**	**275,637.6**	**278,179.8**	**299,115.6**	**1,322,686.2**
		Output 1.2.1. Animal husbandry and infrastructure in Animal Hubs improved				**115,638.8**	**125,382.1**	**130,104.6**	**135,009.2**	**140,102.9**	**646,237.7**
			1.2.1.1. Animal resources infrastructures			**115,638.8**	**125,382.1**	**130,104.6**	**135,009.2**	**140,102.9**	**646,237.7**
				Establish animal resources production hubs (meat, dairy, eggs & fish)	Number	1,121.1	1,164.1	1,208.8	1,255.2	1,303.5	6,052.6

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Improve livestock sheds for zero-grazing policy	Number	114,309.9	124,002.4	128,672.1	133,521.8	138,558.5	639,064.6
				Construct boreholes	Number	-	-	-	-	-	-
				Rehabilitate valley dams	Number	-	-	-	-	-	-
				Construct modern livestock market	Number	207.8	215.7	223.8	232.2	241.0	1,120.5
			Subtotal			**115,638.8**	**125,382.1**	**130,104.6**	**135,009.2**	**140,102.9**	**646,237.7**
		Output 1.2.2. Sustainable animal breeding established				**1,320.1**	**3,165.9**	**16,157.7**	**417.1**	**903.6**	**21,964.4**
			1.2.2.1. Genetic Improvement			**1,320.1**	**3,165.9**	**16,157.7**	**417.1**	**903.6**	**21,964.4**
				Establish centre of excellence for animal genetics	Number	-	-	14,545.5	-	-	14,545.5
				Establish breeding centres for cattle breed	Number	-	559.0	-	-	-	559.0
				Establish breeding centers for pig breed	Number	-	-	167.8	-	-	167.8
				Establish breeding centers for goat breed	Number	779.4	-	839.2	-	903.6	2,522.2
				Establish breeding centers for sheep breed	Number	-	377.4	-	-	-	377.4
				Establish breeding centers for rabbit breeds	Number	-	161.7	-	-	-	161.7
				Establish breeding centers for layer breed	Number	-	269.6	-	-	-	269.6
				Establish breeding centers for broiler breed	Number	-	269.6	-	-	-	269.6
				Establish breeding centers for dual purpose poultry breeds	Number	259.8	-	279.7	-	-	539.5
				Introduce improved breeds bulls for dairy cattle	Number	83.1	129.4	-	139.3	-	351.9

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Introduce improved breeds bulls for beef	Number	41.6	43.1	-	46.4	-	131.1
				Introduce improved breeds for pig (boar and gilts)	Number	-	75.5	156.6	-	-	232.1
				Introduce improved breeds for goat	Number of parents	-	25.9	-	37.2	-	63.0
				Introduce improved breeds for sheep	Number of parents	-	12.9	-	18.6	-	31.5
				Introduce improved breeds for poultry	Number of parents	0.3	0.6	1.0	1.4	-	3.4
				Introduce improved breeds for rabbits	Number of parents	155.9	161.7	167.8	174.2	-	659.6
				Establish LN2 plants and near Animal Hubs to ease logistic for AI provision	Number	-	1,058.3	-	-	-	1,058.3
				Create comprehensive legal framework for animal breeding and genetic management	Number	-	21.2	-	-	-	21.2
			Subtotal			**1,320.1**	**3,165.9**	**16,157.7**	**417.1**	**903.6**	**21,964.4**
		Output 1.2.3. Access to animal feed improved				**12,741.7**	**13,935.2**	**15,134.9**	**17,057.1**	**19,419.2**	**78,288.2**
			1.2.3.1. Animal feeding			**12,741.7**	**13,935.2**	**15,134.9**	**17,057.1**	**19,419.2**	**78,288.2**
				Increase area under improved forage	Ha	12,230.0	13,228.3	14,285.5	15,975.4	18,130.0	73,849.2
				Support farmer organizations with equipment and training for feed production	Number	75.4	105.8	109.9	114.1	118.5	523.7
				Support forage seed multipliers including climate seed varieties	Number	385.2	495.3	613.2	739.4	874.5	3,107.6
				Increase access to Machinery used in fodder harvesting and processing	Number	51.0	105.8	126.4	228.2	296.2	807.6

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
			Subtotal			**12,741.7**	**13,935.2**	**15,134.9**	**17,057.1**	**19,419.2**	**78,288.2**
		Output 1.2.4. Animal health systems strengthened				**91,889.4**	**102,556.0**	**113,638.9**	**125,009.1**	**137,917.1**	**571,010.6**
			1.2.4.1. Animal health			**91,889.4**	**102,556.0**	**113,638.9**	**125,009.1**	**137,917.1**	**571,010.6**
				Establish and strengthen the national epidemic surveillance programme	Number (Report)	102.6	106.9	111.4	116.1	121.0	558.0
				Establish and operationalize veterinary clinics	Number	1,956.8	3,725.1	5,626.3	7,668.2	9,858.9	28,835.3
				Increase proximity to private veterinary services providers	Number	72,442.7	77,374.9	82,603.2	88,138.4	93,991.6	414,550.7
				Implement Veterinary Sanitary Mandate (VSM)	Number (Report)	1,834.5	1,904.9	1,978.0	2,054.0	2,132.9	9,904.3
				Vaccinate cattle	Number	3,054.9	3,195.6	3,367.1	3,530.2	3,868.6	17,016.3
				Vaccinate goats	Number	4,327.1	5,793.2	6,875.0	7,139.1	7,876.9	32,011.2
				Vaccinate sheep's	Number	1,033.2	1,404.0	1,666.1	1,730.1	1,908.9	7,742.4
				Vaccinate pig	Number	2,225.1	2,567.2	2,887.9	3,921.5	5,629.3	17,231.0
				Vaccinate rabbit	Number	59.1	135.3	448.0	645.3	859.6	2,147.2
				Vaccinate poultry	Number	4,853.5	6,349.0	8,076.1	10,066.3	11,669.5	41,014.3
				Subtotal		**91,889.4**	**102,556.0**	**113,638.9**	**125,009.1**	**137,917.1**	**571,010.6**
		Output 1.2.5. Fisheries and aquaculture developed				**446.1**	**2,657.1**	**585.2**	**670.6**	**766.9**	**5,125.8**
			1.2.5.1. Fish production			**446.1**	**2,657.1**	**585.2**	**670.6**	**766.9**	**5,125.8**
				Establish the National Aquaculture Research Centre	Number	-	2,156.6	-	-	-	2,156.6
				Conduct capacity building of fishers, fish farmers and other value chain actors	Number	52.7	68.6	81.0	89.4	103.5	395.1
				Establish FFS of fish farmers	Number	0.6	0.6	0.7	0.7	0.7	3.3

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Establish and operationalize hatcheries	Number	29.1	-	-	-	-	29.1
				Produce fingerlings for aquaculture	Number	-	-	-	-	-	-
				Establish aquaparks	Number	363.7	431.3	503.5	580.5	662.7	2,541.7
				Subtotal		**446.1**	**2,657.1**	**585.2**	**670.6**	**766.9**	**5,125.8**
		Output 1.2.6. Beekeeping developed				**5.1**	**15.7**	**16.2**	**16.7**	**5.8**	**59.5**
			1.2.6.1. Honey production			**5.1**	**15.7**	**16.2**	**16.7**	**5.8**	**59.5**
				Establish bee queen rearing centres	Number	-	10.5	10.8	11.2	-	32.5
				Build capacities of Beekeepers	Number	-	-	-	-	-	-
				Increase the number of improved bee colonies in modern hives	Number	-	-	-	-	-	-
				Establish bee reserves	Number	5.1	5.2	5.4	5.6	5.8	27.1
			Subtotal			**5.1**	**15.7**	**16.2**	**16.7**	**5.8**	**59.5**
PRIORITY AREA 2: INCLUSIVE MARKETS AND POST-HARVEST MANAGEMENT FOR SUSTAINABLE AGRI-FOOD SYSTEMS						**164,932**	**177,909**	**337,169**	**210,636**	**230,523**	**1,121,168.8**
	OUTCOME 2.1 BOOSTED AGRICULTURE EXPORTS					**29,837.4**	**25,160.9**	**27,627.3**	**29,344.2**	**32,475.3**	**144,445.1**
		Output 2.1.1. Export crops expanded				**26,808.4**	**22,011.7**	**23,239.2**	**24,779.3**	**27,726.5**	**124,565.2**
			2.1.1.1. Increase the area under export crop production within AgriHubs			**20,889.0**	**14,810.4**	**15,753.9**	**17,021.9**	**19,674.8**	**88,149.9**
				Coffee	Ha	7,471.0	2,381.1	2,472.5	2,567.5	2,666.2	17,558.3
				Tea	Ha	5,946.4	6,174.4	6,411.4	6,657.7	7,606.3	32,796.3
				Pyrethrum	Ha	26.5	27.6	28.6	29.7	30.9	143.3
				Essential oils	Ha	186.3	193.4	200.8	208.6	216.6	1,005.7
				French beans	Ha	26.0	28.8	37.4	38.8	44.3	175.4

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Chili (in green houses)	Ha	580.0	854.3	1,267.3	1,870.9	2,771.7	7,344.2
				Avocado	Ha	82.0	292.6	338.5	347.5	360.8	1,421.4
				Passion fruit	Ha	3.2	13.4	13.9	14.5	18.8	63.8
				Macadamia	Ha	605.4	558.8	1,027.5	665.3	1,160.1	4,016.9
				Flowers	Ha	5,962.1	4,286.0	3,956.0	4,621.4	4,799.1	23,624.7
			Subtotal			**20,889.0**	**14,810.4**	**15,753.9**	**17,021.9**	**19,674.8**	**88,149.9**
			2.1.1.2. Operationalization of specialised AgriHubs Export handling facilities			**5,715.5**	**5,930.5**	**6,165.1**	**6,385.8**	**6,626.7**	**30,823.6**
				Increase cold-chain facilities	Number	5,195.9	5,391.4	5,594.4	5,805.3	6,024.3	28,011.3
				Establish a Traceability system in export value chains	Number	-	-	11.2	-	-	11.2
				Adopt Third party certified products and systems	Number	519.6	539.1	559.4	580.5	602.4	2,801.1
			Subtotal			**5,715.5**	**5,930.5**	**6,165.1**	**6,385.8**	**6,626.7**	**30,823.6**
			2.1.1.3. Unlock growth in export value chains to diversify exports			**203.9**	**1,270.8**	**1,320.3**	**1,371.6**	**1,425.0**	**5,591.6**
				Identify potential markets for diversified export products	Number	-	-	-	-	-	-
				Conduct market intelligence studies	Number	203.9	211.8	220.0	228.6	237.5	1,101.8
				Penetrate identified markets	Number	-	1,059.0	1,100.2	1,143.0	1,187.5	4,489.8
			Subtotal			**203.9**	**1,270.8**	**1,320.3**	**1,371.6**	**1,425.0**	**5,591.6**
		Output 2.1.2. Rwandan agri- exports de-commoditized				**3,029.05**	**3,149.12**	**4,388.13**	**4,564.85**	**4,748.76**	**19,879.9**
			2.1.2.1. Enhance the market share and public diplomacy			**1,961.9**	**2,037.2**	**2,115.4**	**2,196.6**	**2,281.1**	**10,592.1**
				Organize trade events through economic diplomacy	Number	1,019.2	1,058.3	1,098.9	1,141.1	1,185.0	5,502.4

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Organize exhibitions and trade show at local, regional and international level	Number	509.6	529.1	549.4	570.5	592.5	2,751.2
				Initiate and sign direct supply agreements and protocols in high-value markets	Number	25.5	26.5	27.5	28.5	29.6	137.6
				Organize branding campaigns for Rwandan products	Number	407.7	423.3	439.6	456.4	474.0	2,201.0
			Subtotal			**1,961.9**	**2,037.2**	**2,115.4**	**2,196.6**	**2,281.1**	**10,592.1**
			2.1.2.2. Strengthening home market for export products			**1,067.1**	**1,112.0**	**2,272.8**	**2,368.2**	**2,467.7**	**9,287.8**
				Organize local campaigns for home consumption and agri-tourism	Number	41.0	42.8	44.6	46.4	48.4	223.2
				Establish facilities for exporting and domestic value addition	Number	1,026.1	1,069.2	2,228.2	2,321.8	2,419.3	9,064.6
			Subtotal			**1,067.1**	**1,112.0**	**2,272.8**	**2,368.2**	**2,467.7**	**9,287.8**
	OUTCOME 2.2. STRENGTHENED MARKET LINKAGES AND POST-HARVEST INFRASTRUCTURE					**29,369.2**	**41,279.9**	**48,616.1**	**54,970.5**	**60,604.9**	**234,840.6**
		Output 2.2.1. Organisation models of farmers and value chain actors improved				**1,471.0**	**1,634.1**	**2,770.3**	**3,621.1**	**3,583.9**	**13,080.5**
			2.2.1.1. Cooperatives in AgriHubs			**1,471.0**	**1,634.1**	**2,770.3**	**3,621.1**	**3,583.9**	**13,080.5**
				Support cooperatives working in AgriHubs scheme	Number	917.5	953.1	1,980.4	2,743.2	2,850.1	9,444.3
				Support women and youth led-cooperatives	Number	76.5	79.4	165.0	228.6	-	549.5
				Develop comprehensive training module on governance and management	Number	30.6	31.8	33.0	34.3	35.6	165.3

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Conduct training sessions per cooperative	Number	81.6	84.7	88.0	91.4	95.0	440.7
				Establish and coordinate new value chain platforms	Number	254.9	370.7	385.1	400.1	475.0	1,885.7
				Strengthen market linkages through contract farming	Contracts	110.1	114.4	118.8	123.4	128.3	595.0
			Subtotal			**1,471.0**	**1,634.1**	**2,770.3**	**3,621.1**	**3,583.9**	**13,080.5**
		Output 2.2.2. Post-harvest handling for reduced losses improved				**11,330.8**	**23,552.0**	**26,506.6**	**31,654.7**	**37,458.9**	**130,502.8**
			2.2.2.1. Post-harvest management			**11,330.8**	**23,552.0**	**26,506.6**	**31,654.7**	**37,458.9**	**130,502.8**
				Establish community-based facilities for post-harvest handling and local value addition, driven by private sector engagement	Community-based facilities	52.0	53.9	55.9	58.1	60.2	280.1
				Enhance skills in post-harvest management	Trained farmers	752.6	879.3	1,072.1	1,280.4	1,558.6	5,543.1
				Construct animal feeds factories (including fish feeds industry)	Number	-	4,313.1	2,237.8	2,322.1	2,409.7	11,282.7
				Foster public-private partnerships to establish large-scale impact initiatives for post-harvest handling	Number	41.0	42.8	66.8	92.9	121.0	364.5
				Develop and implement private sector-led facilities and services aimed at enhancing market linkages for post-harvest handling	Number	10.2	10.6	11.0	11.4	11.8	55.0
				Establish and upgrade milk collection centres (MCCs) to streamline milk supply to the market	Number	86.3	805.5	1,578.8	144.6	100.0	2,715.0

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Establish milk collection points (MCPs)	Number	166.3	172.5	179.0	185.8	192.8	896.4
				Establish and upgrade Cold storage facilities	Number	129.9	134.8	139.9	145.1	301.2	850.9
				Increase the storage capacity of animal feeds	Number (cumulative)	4,104.4	6,415.2	8,912.9	16,252.6	21,773.8	57,458.9
				Strengthen MCCs as a hub to improve supply and milk collection	Number	-	13.9	29.0	45.3	62.9	151.0
				Construct Landing sites (Fish)	Number	2,338.2	2,426.1	2,517.5	1,567.4	1,626.6	10,475.8
				Construct fish drying flakes (small fish)	Number	207.8	215.7	167.8	174.2	60.2	825.7
				Establish smoking areas (fish)	Number	52.0	-	55.9	-	60.2	168.1
				Purchase Mobile dryers for cereals	Number	1,247.0	3,234.8	3,356.7	3,483.2	4,518.2	15,839.9
				Construct collection centres	Number	498.8	215.7	223.8	232.2	241.0	1,411.4
				Construct drying grounds	Number	467.6	1,940.9	2,618.2	2,507.9	1,626.6	9,161.2
				Construct drying shelters (maize and beans)	Number	1,169.1	2,668.7	3,272.7	3,134.9	2,710.9	12,956.4
				Procure appropriate packaging materials	Number	7.6	8.4	10.8	16.7	23.0	66.6
			Subtotal			**11,330.8**	**23,552.0**	**26,506.6**	**31,654.7**	**37,458.9**	**130,502.8**
		Output 2.2.3. Agriculture commodity safety and quality Increased				**1,231.3**	**106.9**	**2,673.9**	**-**	**1,451.6**	**5,463.7**
			2.2.3.1. Agriculture testing Facilities			**1,231.3**	**106.9**	**2,673.9**	**-**	**1,451.6**	**5,463.7**
				Upgrade testing facilities for safety and quality parameters	Number	1,231.3	-	2,673.9	-	1,451.6	5,356.8
				Establish a traceability system	Number	-	106.9	-	-	-	106.9

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
			Subtotal			**1,231.3**	**106.9**	**2,673.9**	**-**	**1,451.6**	**5,463.7**
		Output 2.2.4. Value addition increased				**13,154.8**	**13,669.6**	**14,204.7**	**14,761.1**	**15,340.2**	**71,130.5**
			2.2.4.1. Facilities for value addition			**13,154.8**	**13,669.6**	**14,204.7**	**14,761.1**	**15,340.2**	**71,130.5**
				Establish and upgrade small livestock slaughter slabs	Number	6,117.2	6,356.3	6,604.9	6,863.4	7,132.2	33,074.1
				Establish and upgrade dairy processing facilities	Number	3,976.2	4,131.6	4,293.2	4,461.2	4,635.9	21,498.2
				Establish and upgrade local wholegrain flour mills	Number	3,058.6	3,178.2	3,302.5	3,431.7	3,566.1	16,537.0
				Provide technical assistance to business operators in standardization	Number	2.8	3.5	4.1	4.8	6.0	21.2
			Subtotal			**13,154.8**	**13,669.6**	**14,204.7**	**14,761.1**	**15,340.2**	**71,130.5**
		Output 2.2.5. Trade infrastructures improved				**2,181.3**	**2,317.3**	**2,460.6**	**4,933.6**	**2,770.3**	**14,663.2**
			2.2.5.1. Aggregation and markets facilities			**2,181.3**	**2,317.3**	**2,460.6**	**4,933.6**	**2,770.3**	**14,663.2**
				Establish Kigali wholesale market	Number	-	-	-	2,322.1	-	2,322.1
				Strengthen animal and livestock markets	Number	571.5	647.0	727.3	812.7	903.6	3,662.2
				Conduct need assessment for infrastructures needs /e	Number	1,558.8	1,617.4	1,678.3	1,741.6	1,807.3	8,403.4
				Develop protocols for trade facilities	Number	51.0	53.0	55.0	57.2	59.4	275.5
			Subtotal			**2,181.3**	**2,317.3**	**2,460.6**	**4,933.6**	**2,770.3**	**14,663.2**
	OUTCOME 2.3 IMPROVED FOOD SECURITY AND NUTRITION					**105,725**	**111,469**	**260,925**	**126,321**	**137,442**	**741,883.1**
		Output 2.3.1. Food security and nutrition improved				**2,336.8**	**2,558.3**	**2,826.4**	**3,153.3**	**3,463.9**	**14,338.6**
			2.3.1.1. Nutrition sensitive Agriculture			1,019.2	1,058.3	1,098.9	1,141.1	1,185.0	5,502.4

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Facilitate the establishment of schools' orchards and gardens	Number	1,019.2	1,058.3	1,098.9	1,141.1	1,185.0	5,502.4
			2.3.1.2. Produce biofortified seeds			1,317.6	1,500.0	1,727.5	2,012.2	2,278.9	8,836.2
				Beans	MT	357.4	425.6	498.9	577.6	662.0	2,521.3
				Sweet potato	MT	275.7	287.2	299.3	311.9	325.0	1,499.1
				Cassava	MT	204.2	212.8	221.7	231.0	240.7	1,110.4
				Mushrooms	MT	1.0	1.5	1.8	2.3	2.9	9.5
				Potato	MT	204.2	234.1	266.1	300.3	337.0	1,341.7
				Develop and disseminate Food-Based Dietary Guidelines (FBDGs)	Number	275.2	338.6	439.6	588.8	711.0	2,353.2
				Outreach campaigns for nutrition sensitive agriculture mainstreaming guidelines	Number	-	0.3	0.3	0.3	0.3	1.1
			Subtotal			1,317.6	1,500.0	1,727.5	2,012.2	2,278.9	8,836.2
		Output 2.3.2. Households supported with Animal resources production (at least 30% distributed to women headed households)				**5,815.5**	**6,945.7**	**8,443.3**	**9,693.0**	**11,555.1**	**42,452.6**
			2.3.2.1. Distribution of Animal resources and Vegetable seeds to families			5,815.5	6,945.7	8,443.3	9,693.0	11,555.1	42,452.6
				Cows under Girinka program	Number	-	-	-	-	-	-
				Vegetable seeds for kitchen garden	MT	0.2	0.2	0.2	0.2	0.2	1.1
				Goats	Number	1,899.2	2,164.2	2,475.5	2,947.3	3,668.3	13,154.4
				Pigs	Number	2,548.6	3,109.3	3,811.1	4,229.2	4,916.3	18,614.5
				Sheep	Number	605.5	830.3	1,048.1	1,259.1	1,495.3	5,238.3
				Fruits trees	Number	570.9	635.4	880.2	1,005.9	1,187.5	4,279.8
				Rabbit	Number	15.3	21.2	33.0	45.7	59.4	174.6

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Poultry	Number	175.8	185.0	195.3	205.7	228.0	989.8
			Subtotal			5,815.5	6,945.7	8,443.3	9,693.0	11,555.1	42,452.6
		Output 2.3.3. Food stability and mitigating related shocks ensured				**97,573.1**	**101,964.5**	**249,655.7**	**113,475.0**	**122,423.5**	**685,091.9**
			2.3.3.1. Increase National Storage Grain Reserves			97,573.1	101,964.5	249,655.7	113,475.0	122,423.5	685,091.9
				Strengthening Private-Led Commodity Reserves	Number	-	-	141,961.4	-	-	141,961.4
				National storage capacity of food crops	MT	77,938.6	80,871.1	83,916.6	87,079.4	90,364.2	420,169.9
				Grain storage capacity (silos) for animal feeds	MT	1,291.9	1,362.4	1,541.1	1,715.9	2,044.6	7,955.8
				Food stored as strategic reserve							
				Maize	MT	6,720.0	6,780.1	7,705.7	8,464.9	9,509.6	39,180.3
				Beans	MT	8,564.1	9,137.2	9,907.4	10,724.1	13,372.9	51,705.7
				Rice	MT	3,058.6	3,813.8	4,623.4	5,490.7	7,132.2	24,118.8
				Soya	MT	-	-	-	-	-	-
			Subtotal			97,573.1	101,964.5	249,655.7	113,475.0	122,423.5	685,091.9
PRIORITY AREA 3: STRENGTHENING AGRI-FOOD SYSTEMS ENABLERS FOR EFFECTIVE AND EFFICIENT DELIVERY						**266,152.6**	**262,830.8**	**311,050.2**	**325,164.4**	**366,592.0**	**1,531,789.9**
	OUTCOME 3.1 STRENGTHENED RESEARCH AND TECHNOLOGY TRANSFER FOR AGRI-FOOD SYSTEMS					**162,025.4**	**151,605.4**	**184,545.2**	**165,053.9**	**197,414.3**	**860,644.3**
		Output 3.1.1. Demand-driven research enhanced				**67,308.6**	**48,299.6**	**76,687.8**	**51,961.4**	**78,324.4**	**322,581.8**
			3.1.1.1. Develop Climate resilient and disease resistant varieties			**21,143.4**	**18.8**	**22,808.3**	**34.8**	**24,546.9**	**68,552.1**
				Maize	Number	-	10.7	-	11.6	-	22.3
				Rice	Number	5.2	-	5.6	-	6.0	16.8

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Wheat	Number	36.2	-	16.7	5.8	6.0	64.8
				Cassava	Number	-	5.4	-	2.9	-	8.3
				Irish potato	Number	2.6	-	8.4	-	-	11.0
				Sweet potato	Number	2.6	-	-	8.7	-	11.3
				Beans	Number	-	-	12.6	-	-	12.6
				Soybean	Number	-	-	12.6	-	-	12.6
				Banana	Number	-	-	2.8	-	-	2.8
				Horticulture (fruits)	Number	-	2.7	2.8	5.8	6.0	17.3
				Coffee	Number	7,032.3	-	7,582.3	-	8,176.3	22,790.9
				Tea	Number	7,032.3	-	7,582.3	-	8,176.3	22,790.9
				Pyrethrum	Number	7,032.3	-	7,582.3	-	8,176.3	22,790.9
			Subtotal			21,143.4	18.8	22,808.3	34.8	24,546.9	68,552.1
			3.1.1.1.2. Develop new animal breeds			**112.1**	**254.0**	**263.7**	**296.7**	**296.2**	**1,222.8**
				Goat	Number	20.4	21.2	22.0	22.8	23.7	110.0
				Sheep	Number	-	21.2	-	22.8	-	44.0
				Pig	Number	20.4	21.2	22.0	22.8	23.7	110.0
				Layer poultry	Number	-	-	11.0	-	-	11.0
				Broiler poultry	Number	-	-	-	11.4	11.8	23.3
				Dual poultry	Number	-	10.6	-	-	11.8	22.4
				New dairy	Number	-	52.9	54.9	57.1	59.2	224.2
				New beef	Number	51.0	105.8	109.9	114.1	118.5	499.3
				Rabbits	Number	20.4	21.2	44.0	45.6	47.4	178.5
				Produce research products in bee genetics	Number	-	-	-	-	-	-
			Subtotal			112.1	254.0	263.7	296.7	296.2	1,222.8

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
			3.1.1.1.3. Develop new production technologies			**19,568.8**	**20,402.9**	**22,600.1**	**21,691.3**	**22,312.6**	**106,575.7**
				Upgrade research stations	Number	15,859.7	16,362.8	16,882.2	17,418.3	17,971.7	84,494.7
				Develop confined facilities	Number	-	-	1,678.3	-	-	1,678.3
				Establish screen house facilities	Number	3,453.9	3,563.5	3,676.6	3,793.3	3,913.9	18,401.2
				Construction of Greenhouse facilities	Number	-	-	-	-	-	-
				Develop databases for National soil and crop information system	Number	-	31.7	-	-	-	31.7
				Develop integrated soil fertility mgt technologies	Number	20.8	21.6	22.4	23.2	24.1	112.0
				Produce fertilizer recommendations per crop	Number	61.2	63.5	-	68.5	71.1	264.2
				Develop new bio-fertilizer technologies	Number	-	21.2	-	22.8	-	44.0
				Develop biotechnology products	Number	-	52.9	54.9	57.1	59.2	224.2
				Develop improved manure management technologies	Number	-	21.2	22.0	-	47.4	90.5
				Develop fodder/animal feed technologies	Number	40.8	21.2	65.9	45.6	47.4	220.9
				Develop crop management technologies/innovations	Number	40.8	42.3	44.0	45.6	47.4	220.1
				Develop new efficient water use technologies	Number	-	21.2	-	22.8	-	44.0
				Develop New climate smart techniques	Number	-	21.2	22.0	22.8	23.7	89.7
				Develop diagnostic tools for quick detection of major diseases /d	Number	30.6	31.7	33.0	34.2	35.5	165.1

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Develop early warning systems for pests and diseases	Number	-	-	33.0	-	-	33.0
				Develop new pest/disease control and IPM packages for crops	Number	61.2	127.0	65.9	136.9	71.1	462.1
				Conduct pest and disease surveillance	Number	-	-	-	-	-	-
			Subtotal			19,568.8	20,402.9	22,600.1	21,691.3	22,312.6	106,575.7
			3.1.1.1.4. Develop post-harvest technologies			**20.4**	**21.2**	**44.0**	**22.8**	**23.7**	**132.0**
				Develop technologies for value addition	Number	20.4	-	22.0	-	23.7	66.1
				Develop technologies for post-harvest handling	Number	-	21.2	-	22.8	-	44.0
				Develop food waste management technologies	Number	-	-	22.0	-	-	22.0
			Subtotal			20.4	21.2	44.0	22.8	23.7	132.0
			3.1.1.1.5. Conservation of genetic resources			**24,670.0**	**25,628.6**	**28,861.0**	**27,661.0**	**28,738.0**	**135,558.6**
				Conserve local cattle breeds	Number	-	-	-	-	-	-
				Characterize and conserve Local poultry breeds	Number	-	-	-	-	-	-
				Conserve local cattle breeds	Number	-	-	-	-	-	-
				Upgrade the National Genebank	Number (Report)	-	-	2,235.9	-	-	2,235.9
				Establish of National Collection of Microbial Genetic Resources	Number of accessions	2,038.8	2,118.1	2,200.4	2,286.0	2,375.0	11,018.4
				Collect, characterize and conserve plant genetic resources	Number	9,786.4	10,166.7	10,562.0	10,973.0	11,400.2	52,888.3

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Collect, characterize and conserve forage genetic resources	Number	9,786.4	10,166.7	10,562.0	10,973.0	11,400.2	52,888.3
				Collect, characterize and conserve local animal genetic resources	Number	3,058.3	3,177.1	3,300.6	3,429.1	3,562.6	16,527.6
			Subtotal			24,670.0	25,628.6	28,861.0	27,661.0	28,738.0	135,558.6
			3.1.1.1.6. Promotion of private - led research			**1,794.0**	**1,974.2**	**2,110.7**	**2,254.8**	**2,407.0**	**10,540.7**
				Acquire patents from researchers on new technologies	Number	254.8	264.6	274.7	285.3	296.2	1,375.6
				Develop new technologies in partnership with the private sector	Number	-	105.8	164.8	228.2	296.2	795.1
				Organize and coordinate research day	Number	1,539.2	1,603.8	1,671.2	1,741.4	1,814.5	8,370.0
			Subtotal			1,794.0	1,974.2	2,110.7	2,254.8	2,407.0	10,540.7
		Output 3.1.2. Customized Agriculture Extension System Enhanced				**84,929.5**	**88,467.1**	**91,941.0**	**96,034.0**	**100,821.4**	**462,193.0**
			3.1.2.1. Customized extension packages in each value chains			**739.2**	**338.2**	**-**	**-**	**-**	**1,077.3**
				Profiling food crops value chains	Number	254.9	-	-	-	-	254.9
				Profiling animal resources value chains	Number	203.9	-	-	-	-	203.9
				Profiling horticulture value chains	Number	203.9	-	-	-	-	203.9
				Develop customized extension package for each value chain	Number	-	338.2	-	-	-	338.2

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Conduct a study on extension services providers in the country	Number	30.6	-	-	-	-	30.6
				Certify extension professionals	Number	-	-	-	-	-	-
				Establish a digital system of professional licensed extension providers	Number	45.9	-	-	-	-	45.9
			Subtotal			739.2	338.2	-	-	-	1,077.3
			3.1.2.2. Capacity development and quality certification			**83,945.7**	**87,874.7**	**91,676.8**	**95,759.4**	**100,536.1**	**459,792.7**
				Conduct need assessment for extension services providers in prioritized value chains	Number	23.4	-	-	-	-	23.4
				Train master trainers on specific value chain and their segments /e	Number	2,417.8	2,519.3	2,625.1	2,735.4	2,850.3	13,147.8
				Train front-line extension agents (such as FFS facilitators, FPs) on the delivery of new extension packages /f	Number	3,488.8	3,635.3	3,899.4	4,295.3	5,230.6	20,549.3
				Support Livestock Farmer Field School (L-FFS) that provides Extension Advisory Services (TWIGIRE MWOROZI)	Number	820.9	1,283.0	1,336.9	1,393.1	1,451.6	6,285.5
				Establish L-FFS groups by L-FFS Facilitators	Number	153.9	160.4	167.1	174.1	181.4	837.0
				Support Livestock Farmer Field School (L-FFS) Facilitators	Number	380.6	396.6	413.3	430.6	448.7	2,069.9

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Establish FFS on fish farming	Number	-	-	-	-	-	-
				Train aquaculture and fisheries master trainers	Number	8,208.8	8,553.6	8,912.9	9,287.2	9,677.3	44,639.8
				Support farmer promoters with basic package	Number	15.4	16.0	16.7	17.4	18.1	83.7
				Support Crop FFS Facilitators	Number	200.1	208.5	217.3	226.4	235.9	1,088.1
				Establish demonstration plots	Number	68,236.0	71,101.9	74,088.2	77,199.9	80,442.3	371,068.2
			Subtotal			83,945.7	87,874.7	91,676.8	95,759.4	100,536.1	459,792.7
			3.1.2.3. Strengthen partnership between private sector, government, and knowledge institutions			**244.7**	**254.3**	**264.2**	**274.5**	**285.3**	**1,323.0**
				Establish platforms of extension providers and scientists to identify research and capacity needs	Number	81.6	84.8	88.1	91.5	95.1	441.0
				Develop research and capacity building agenda for centres of excellence	Number	163.1	169.5	176.1	183.0	190.2	882.0
			Subtotal			244.7	254.3	264.2	274.5	285.3	1,323.0
		Output 3.1.3. Technical Capacity, Education, and Skills Developed				**9,787.3**	**14,838.7**	**15,916.5**	**17,058.5**	**18,268.5**	**75,869.5**
			3.1.3.1. Enhance knowledge and skills in Agriculture related interventions			**9,787.3**	**14,838.7**	**15,916.5**	**17,058.5**	**18,268.5**	**75,869.5**
				Train youth and professional farmers on technical courses by education institutions and other relevant specialized institutions	Number	628.3	945.7	1,288.7	1,658.7	2,057.6	6,579.1
				Organize long term training in Agri-food systems (Masters & PhDs)	Number	9.9	10.3	10.7	11.1	11.6	53.6

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Organize on-job specialized and professional short courses in the Agri-food systems	Number	69.8	72.7	75.8	79.0	82.3	379.7
				Undertake curricula review in collaboration with relevant specialized institutions	Number	51.3	53.5	55.7	58.0	60.5	279.0
				Upgrade schools with facilities to train in Agri-food related disciplines	Number	51.3	53.5	55.7	58.0	60.5	279.0
				Upscale industrial attachment programs to private sector (50% women)	Number	69.7	145.2	302.5	472.9	657.0	1,647.3
				Provide youth with training, mentorship, and start-up packages (50 % women)	Number	698.2	727.5	758.0	789.9	823.1	3,796.6
				Farmer field schools (crops and animal resources)	Number	8,208.8	12,830.4	13,369.3	13,930.8	14,515.9	62,855.3
			Subtotal			9,787.3	14,838.7	15,916.5	17,058.5	18,268.5	75,869.5
	OUTCOME 3.2 STRENGTHENED AGRICULTURE DE-RISKING FOR RESILIENCE					**54,208.6**	**59,131.5**	**72,315.4**	**103,753.0**	**116,182.8**	**405,591.2**
		Output 3.2.1. Access to Agriculture Finance increased				**3,956.4**	**6,835.4**	**8,009.4**	**9,183.2**	**10,772.6**	**38,757.0**
			3.2.1.1 De-risking facility			**3,956.4**	**6,835.4**	**8,009.4**	**9,183.2**	**10,772.6**	**38,757.0**
				Establish credit guarantee facility	Number	-	1,595.8	1,662.8	1,732.7	1,805.5	6,796.8
				Establish grant facility for infrastructure development	Number	-	106.4	110.9	115.5	120.4	453.1
				Establish grant facility for market linkages and technology development	Number	-	106.4	110.9	115.5	120.4	453.1
				Agri-finance products developed	Number	2,552.5	2,659.7	2,771.4	2,887.8	3,009.1	13,880.5

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Digital farmer profiles and transaction histories stored	Number	255.3	531.9	1,108.6	1,732.7	3,009.1	6,637.5
				Conduct financial literacy campaigns targeting farmers and other relevant stakeholders	Number	1,148.6	1,835.2	2,244.8	2,599.0	2,708.2	10,535.9
			Subtotal			3,956.4	6,835.4	8,009.4	9,183.2	10,772.6	38,757.0
		Output 3.2.2. Agriculture Insurance Scheme strengthened				**50,252.2**	**52,296.0**	**64,306.1**	**94,569.8**	**105,410.2**	**366,834.2**
			3.2.2.1 Crop and Animal resource insurance			**50,252.2**	**52,296.0**	**64,306.1**	**94,569.8**	**105,410.2**	**366,834.2**
				Develop and operationalize guidelines for insurance products	Lumpsum	7,927.9	-	-	-	-	7,927.9
				Monitoring compliance with contracts between farmers and insurance firms	Lumpsum	51.0	-	-	-	-	51.0
				Insure area under rice	Ha	226.2	235.2	244.4	256.1	268.3	1,230.1
				Insure area under maize	Ha	201.9	244.7	290.6	339.7	392.3	1,469.2
				Insure area under Irish potatoes	Ha	209.0	346.6	494.6	653.6	824.5	2,528.3
				Insure area under soya bean	Ha	17.5	34.2	52.1	71.4	92.1	267.3
				Insure area under beans	Ha	30.3	59.2	90.4	123.8	159.8	463.5
				Insure area under cassava	Ha	28.3	58.8	91.7	127.0	165.0	470.8
				Insure area under chilli	Ha	23.7	41.9	61.5	82.6	105.2	315.0
				Insure area under French beans	Ha	17.4	34.5	52.9	72.6	93.9	271.3
				Insure cattle	Number	15,222.2	17,654.8	20,206.4	24,004.8	26,320.2	103,408.4
				Insure pig	Number	6,595.3	8,166.6	12,105.9	18,838.7	21,082.3	66,788.8
				Insure poultry	Number	560.2	759.7	922.6	1,218.7	1,363.8	4,825.0
				Insure fishponds/farms	Number	0.8	1.6	2.7	4.3	6.4	15.9

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Insure rabbits	Number	13,479.8	17,777.7	21,495.9	39,171.4	43,836.7	135,761.4
				Train professionals on agriculture insurance	Number	5,660.7	6,880.5	8,194.4	9,604.9	10,699.7	41,040.2
			Subtotal			50,252.2	52,296.0	64,306.1	94,569.8	105,410.2	366,834.2
	OUTCOME 3.3. DIGITISED AGRI-FOOD SYSTEMS					**40,644.4**	**42,943.8**	**44,667.6**	**46,473.6**	**42,410.2**	**217,139.7**
		Output 3.3.1. Affordable digital technologies developed				**20,635.4**	**21,971.7**	**22,831.0**	**23,724.6**	**24,653.7**	**113,816.3**
			3.3.1.1. Device access and connectivity			**20,635.4**	**21,971.7**	**22,831.0**	**23,724.6**	**24,653.7**	**113,816.3**
				Support farmers owning smartphones or other relevant devices through partnerships with telcos	Number	40.8	42.4	44.0	45.8	47.5	220.5
				Subsidize agriculture services on digital transaction fees	Number	203.9	211.9	220.2	228.8	237.7	1,102.5
				Build and maintain the Agricultural Management Information System (AMIS)	Number	20,390.7	21,187.7	22,016.4	22,878.1	23,774.0	110,247.0
				Host agriculture services in the data centre (OCI)	Number	-	529.7	550.4	572.0	594.4	2,246.4
			Subtotal			20,635.4	21,971.7	22,831.0	23,724.6	24,653.7	113,816.3
		Output 3.3.2. Data governance enhanced				**16,067.9**	**16,706.5**	**17,348.9**	**18,039.4**	**12,790.4**	**80,953.1**
			3.3.2.1. Agriculture data management			**16,067.9**	**16,706.5**	**17,348.9**	**18,039.4**	**12,790.4**	**80,953.1**
				Develop data Strategy and governance framework	Number	-	10.6	-	-	-	10.6
				Build a scalable data network with incentives	Number	10,195.4	10,593.9	11,008.2	11,439.0	11,887.0	55,123.5
				Invest in innovative technologies and methods such as crowdsourcing, Camera-equipped drones,	Number	5,097.7	5,296.9	5,504.1	5,719.5	-	21,618.2

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				and high-resolution satellite imagery to gather data more efficiently and timely							
				Mobilize new data collection agents and farmer promoters including youth onboarded to support quality data collection through GOR and private sector	Number	764.7	794.5	825.6	857.9	891.5	4,134.3
				Develop Integrated decision support dashboards	Number	10.2	10.6	11.0	22.9	11.9	66.6
			Subtotal			16,067.9	16,706.5	17,348.9	18,039.4	12,790.4	80,953.1
		Output 3.3.3. Digital innovation in agriculture value chains promoted				**3,364.5**	**3,496.0**	**3,632.7**	**3,774.9**	**3,922.7**	**18,190.8**
			3.3.3.1 Agritech Innovation Pipeline			**3,364.5**	**3,496.0**	**3,632.7**	**3,774.9**	**3,922.7**	**18,190.8**
				Digitize and operationalize agriculture services	Number	1,019.5	1,059.4	1,100.8	1,143.9	1,188.7	5,512.3
				Digitalize value chains systems	Number	51.0	53.0	55.0	57.2	59.4	275.6
				Facilitate farmers and traders to access local and international markets though e-commerce	Number	1,019.5	1,059.4	1,100.8	1,143.9	1,188.7	5,512.3
				Registor of farmers & livestock through Agriculture Management Information System (AMIS)	Number	1,274.4	1,324.2	1,376.0	1,429.9	1,485.9	6,890.4
			Subtotal			3,364.5	3,496.0	3,632.7	3,774.9	3,922.7	18,190.8
		Output 3.3.4. Digital competencies developed				**454.3**	**578.6**	**601.8**	**626.0**	**651.1**	**2,911.7**
			3.3.4.1. Enhance digital literacy			**454.3**	**578.6**	**601.8**	**626.0**	**651.1**	**2,911.7**

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Train digital ambassadors, farmer promoters, extension workers, and village elders in digital literacy	Number	1.9	2.0	2.1	2.2	2.3	10.5
				Train Farmers in digital literacy and using digital services	Number	197.5	205.8	214.4	223.4	232.8	1,073.9
				Establish youth led hanga hubs	Number	-	105.9	110.1	114.4	118.9	449.3
				Develop value chain digital literacy modules	Number	254.9	264.8	275.2	286.0	297.2	1,378.1
			Subtotal			454.3	578.6	601.8	626.0	651.1	2,911.7
		Output 3.3.5. Sustainable business models for digital systems and platforms developed				**112.1**	**180.5**	**242.2**	**297.4**	**380.4**	**1,212.6**
			3.3.5.1 Upgrade and develop digital systems			**112.1**	**180.5**	**242.2**	**297.4**	**380.4**	**1,212.6**
				Develop and implement a digital financial strategy /framework for agriculture, aiming to increase the percentage of farmers utilizing mobile banking, wallets, and credit platforms	Number	-	0.4	-	-	-	0.4
				Initiate business models for digital platforms	Number	-	10.6	11.0	-	11.9	33.5
				Mobilize investors through public-private partnerships in digital agriculture projects within a defined timeframe	Number	61.2	63.6	66.0	68.6	71.3	330.7
				Mobilize technical experts to support implementation of development partner funded projects implementation	Number	51.0	105.9	165.1	228.8	297.2	848.0
			Subtotal			112.1	180.5	242.2	297.4	380.4	1,212.6

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
		Output 3.3.6. Digitalization Networking Strengthened				**10.2**	**10.6**	**11.0**	**11.4**	**11.9**	**55.1**
			3.3.6.1 Reinforce coordination for agriculture digitalization			**10.2**	**10.6**	**11.0**	**11.4**	**11.9**	**55.1**
				Establish a cross-cutting Digital Agriculture Working Group	Number	5.1	5.3	5.5	5.7	5.9	27.6
				Establish a National Digital Agriculture Task Force	Number	5.1	5.3	5.5	5.7	5.9	27.6
			Subtotal			10.2	10.6	11.0	11.4	11.9	55.1
	OUTCOME 3.4 STRENGTHENED AGRI-FOOD SYSTEMS PLANNING AND COORDINATION					**9,274.2**	**9,150.1**	**9,521.9**	**9,883.9**	**10,584.7**	**48,414.7**
		Output 3.4.1. Capacity for planning and knowledge management enhanced				**7,053.5**	**7,001.3**	**7,288.9**	**7,588.4**	**8,021.2**	**36,953.2**
			3.4.1.1. Strengthen public sector capacity to design impactful programs			**7,053.5**	**7,001.3**	**7,288.9**	**7,588.4**	**8,021.2**	**36,953.2**
				Establish a Programme designing Unit	Lumpsum	609.5	628.8	648.8	669.4	690.7	3,247.3
				Design programmes	Number	492.5	171.1	178.3	185.7	193.5	1,221.1
				Develop projects designed as PPP, public, or private prepared and funded	Number	718.3	748.4	779.9	812.6	967.7	4,026.9
				Public sector capacity building programme	Number	3,694.0	3,849.1	4,010.8	4,179.2	4,354.8	20,087.9
				Number of staff trained in core and emerging topics	Number	1,539.2	1,603.8	1,671.2	1,741.4	1,814.5	8,370.0
			Subtotal			7,053.5	7,001.3	7,288.9	7,588.4	8,021.2	36,953.2
		Output 3.4.2. Agri-food systems coordination and value chains developed				**1,129.1**	**1,225.9**	**1,383.7**	**1,552.0**	**1,790.9**	**7,081.6**
			3.4.2.1. Coordination for Agri-food system stakeholders			**1,129.1**	**1,225.9**	**1,383.7**	**1,552.0**	**1,790.9**	**7,081.6**

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Design business plans for value chain development packaged for entrepreneurs	Number	407.8	423.8	440.3	457.6	475.5	2,204.9
				Establish value Chain Platforms	Number	356.8	423.8	550.4	686.3	891.5	2,908.9
				Establish transparent governance structure for agri-PPDs	Number	51.0	53.0	55.0	57.2	59.4	275.6
				Organize meetings with regional value chain platforms to establish linkages	Number	7.6	7.9	8.3	8.6	8.9	41.3
				Establish Food systems Secretariat	Number	305.8	317.5	329.7	342.3	355.5	1,650.8
			Subtotal			1,129.1	1,225.9	1,383.7	1,552.0	1,790.9	7,081.6
		Output 3.4.3. Policy and regulatory reform for an enabling environment reviewed				**407.8**	**423.8**	**440.3**	**457.6**	**475.5**	**2,204.9**
			3.4.3.1. Review policy and strategic documents			**407.8**	**423.8**	**440.3**	**457.6**	**475.5**	**2,204.9**
				Set-up a taskforce to review regulatory bottlenecks	Number	102.0	105.9	110.1	114.4	118.9	551.2
				Review regulatory bottlenecks	Number	102.0	105.9	110.1	114.4	118.9	551.2
				Organize a stakeholder consultation on regulatory review needs conducted	Number	203.9	211.9	220.2	228.8	237.7	1,102.5
			Subtotal			407.8	423.8	440.3	457.6	475.5	2,204.9
		Output 3.4.4. Institutional reforms for effective implementation enhanced				**683.8**	**499.1**	**408.9**	**286.0**	**297.2**	**2,175.0**
			3.4.4.1. Modernize Institutional Framework			**683.8**	**499.1**	**408.9**	**286.0**	**297.2**	**2,175.0**
				Conduct institutional review in light of PSTA5	Number	51.0	-	-	-	-	51.0

Priority Area	Outcome	Output	Key Interventions	Activities	Unit	Budget Estimates (RWF Million)					
						24/25	25/26	26/27	27/28	28/29	Total
				Undertake institutional restructuring based on the review	Number	-	105.9	-	-	-	105.9
				Establish National CAES Secretariat	Number	509.8	-	-	-	-	509.8
				Establish Rwanda Forum for Agricultural extension and Advisory Service professionals	Number	-	238.4	247.7	257.4	267.5	1,010.9
				Introduce improved digital processes and systems for more efficient food systems planning	Number	-	26.5	27.5	28.6	29.7	112.3
				Establish PSTA 5 Coordination Program (Program 5)	Amount	123.1	128.3	133.7	-	-	385.1
			Subtotal			683.8	499.1	408.9	286.0	297.2	2,175.0

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