National Agricultural Export Development Board

Republic of Rwanda

NAEB strategic plan 2019-2024

Increasing Agri-export revenues

May 2019

Contents

ACRONYMS

BDS	Business Development Services
CAGR	Compound annual growth rate
CTC	Crush, tear, curl
CWSs	Coffee washing stations
DFID	Department for International Development
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GoR	Government of Rwanda
IDH	Sustainable Trade Initiative
IFC	International Finance Corporation
IGC	International Growth Centre
IMSAR	Improving Market Systems for Agriculture in Rwanda
IPM	Integrated Pest Management
IRR	Internal Rate of Return
MCC	Milk Collection Center
MCF	Mastercard Foundation
MINAGRI	Ministry of Agriculture and Animal Resources
MOU	Memorandum of Understanding
MRL	Maximum Residue Level
NAEB	National Agricultural Export Development Board
NES	National Export Strategy
NGO	Non-Governmental Organization
NISR	National Institute of Statistics of Rwanda
NST	National Strategy for Transformation
PTSA IV	Strategic Plan for Agricultural Transformation 4
RAB	Rwanda Agriculture Board
R&D	Research and Development
RDB	Rwanda Development Board
RSB	Rwanda Standards Board
RWF	Rwandan francs
SBP	Strategic Business Plan
SDG	Sustainable Development Goals
SEZ	Special Economic Zone
SHFS	Smallholder farmers
SPS	Sanitary and phytosanitary
UNCTAD	United Nations Conference on Trade and Development
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USD	US dollar
WFP	World Food Program

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FOREWORD

FOREWORD FROM THE BOARD CHAIR

The agriculture export sub-sector plays a strategic role in improving Rwanda's balance of trade and in generating income for producers, processors and other actors in the agricultural sector. In the year ending 2017, the industry generated USD $ 428,916,000 in foreign exchange. Agricultural export markets are becoming increasingly competitive. Apart from the challenges of bringing sufficient quantities of quality products to market in a timely manner, management of price volatility is a continual challenge. A successful future strategic direction for the National Agricultural Export Development Board (NAEB) will not be based on increased volumes alone but will also require focus on inherently high value commodities, and on increasing their value even further. This makes it imperative for NAEB to position itself to provide relevant, timely, and competitive services and products that meet increasingly demanding customer requirements.

It is with the above background, in consultation with agriculture export subsector stakeholders, referring to the relevant goals and objectives set forth in Vision 2020, the Seven Year Government Plan, NST1, PSTA IV and National Export Strategy, that this Six Year Strategic Plan has been developed to explain how NAEB will increase the export revenues.

I would like to thank the Ministry of Agriculture and Animal Resources under the leadership of the Hon. Minister Dr. Gerardine Mukeshimana, the agricultural export sector stakeholders, our agribusiness partners, our development partners, colleague Members of the Board and the management team for their contribution in putting this Strategic Business Plan together. I look forward to your support in its execution and to your continued contribution to the sustained growth and transformation of our country.

INTRODUCTION BY THE CHIEF EXECUTIVE OFFICER

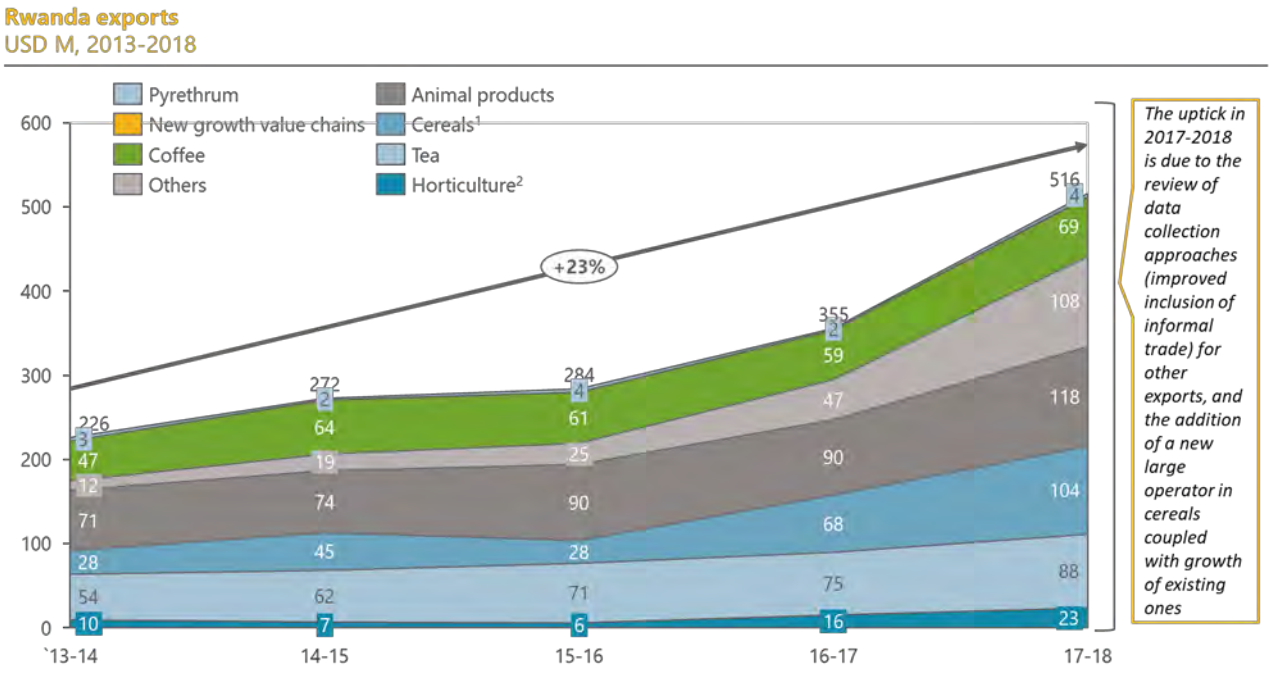
The growth of export revenues is a major preoccupation of our country today and given the characteristics of our economy the agriculture sector provides an opportunity to contribute to the sustained growth of our export revenues. This will however require us to be more market-driven and more knowledge-intensive. It will require continuous growth in the volume and quality of our traditional export commodities, value addition to our export commodities, and deeper penetration into regional export markets and diversification into new export value chains that provide higher returns for our exporters in niche markets around the world.

The engagement of our domestic private sector, attraction of foreign direct investment, the continued support of government to create a competitive environment and of our development partners in building the necessary skill sets and facilitating access to markets will also be of critical importance. This Six Year Strategic Business Plan provides an effective results framework for addressing many of the challenges facing the agriculture export sector identified by stakeholders in the areas of production, productivity, quality, and value-addition, provision of effective support services and coordination of agriculture export sector development.

EXECUTIVE SUMMARY

Rwanda's agricultural exports grew rapidly in recent years under NAEB's leadership, doubling from 225 million USD in 2013-2014 to 516 million USD in 2017-2018 at a 22% compounded annual growth rate (CAGR), and is on pace to reach 1 billion USD by 2024. NAEB's mandate is to drive Rwanda's agri-exports growth by supporting export sector actors across production, value addition, marketing, and policy interventions. Since its establishment in 2011, NAEB has played a critical role in expanding Rwandan ag exports quality and revenue. This success has been due to moderate growth in traditional exports and fast growth in emerging export crops. Rwanda predominantly exported traditional commodities such as tea, coffee, and pyrethrum to international markets, but new high potential export crops have emerged including horticulture, livestock, cereals, and other crops (essential oils, stevia, fish, etc.). While traditional exports continued to grow from 105 million USD in 2013-2014 to 161 million USD in 2017-2018, new emerging crops such as horticulture livestock, cereals, and other export crops showed faster growth given increasing NAEB's efforts to diversify the agriculture export base, up from 121 million USD in 2013-2014 to 335 million USD in 2017-2018.

Figure 1: Rwanda agriculture export value, past trends



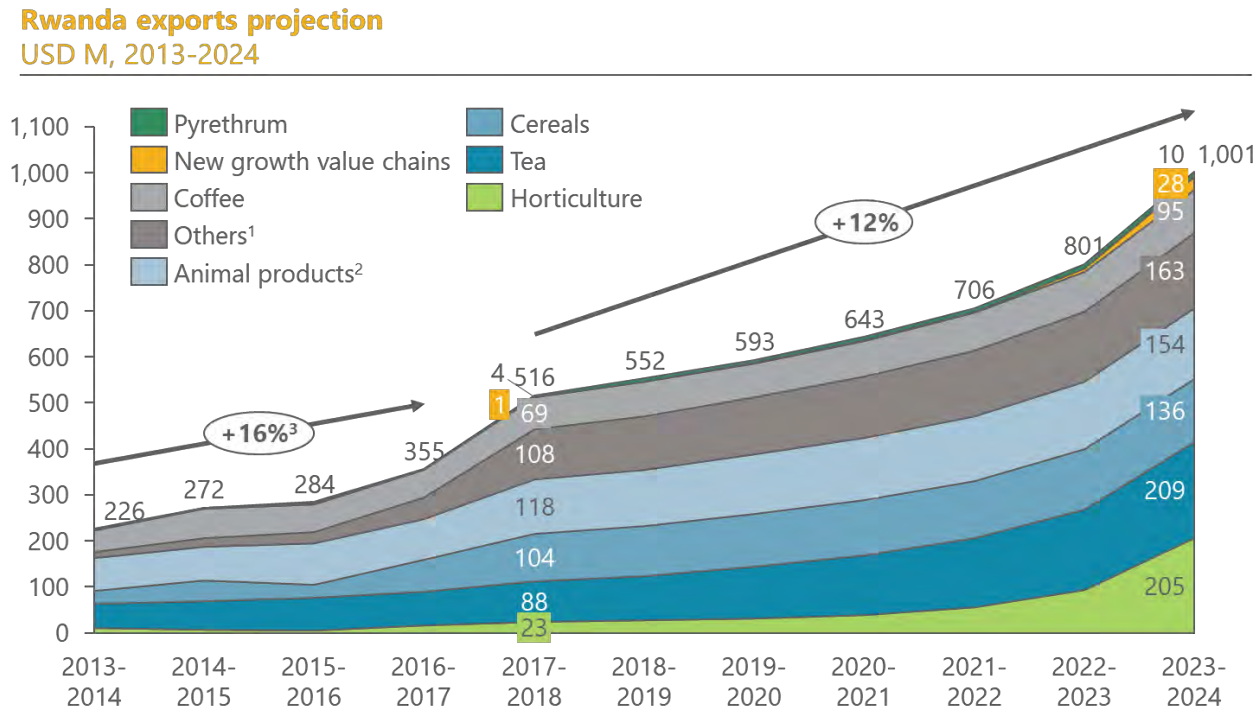
Source: NAEB Strategic Business Plan 2019-2024
1 Others include roots and tubers, pulses, and other products from NAEB's strategic business plan 2019-2024, except for new growth value chains
2 Animal products include 'milk', 'meat', 'live animals', 'hides and skins', 'fish', and 'eggs'

In the strategic plan 2019-2024, NAEB will capitalize on the current growth, while drawing important learnings from the past 2013 – 2018 strategy to address key challenges and to set out strategic objectives to boost agriculture exports. To deliver on its mandate, NAEB has developed a six-year strategic plan to guide its efforts towards expanding agriculture exports and to inform the best allocation of scarce resources. The rapid assessment of the NAEB's performance in the previous strategy points to the need for i) detailed and rigorous analysis on growth drivers to set targets for specific value chains; ii) programming areas that align with new ambitious targets and ensuring appropriate funding in delivery; iii) clearly defined and assigned roles to the implementer (NAEB team or external partner); and iv) aggressive approach in implementation leveraging both NAEB's internal capability and external stakeholders who can accelerate growth. To leverage the full potential of Rwandan ag exports, NAEB must strategically address challenges related to marketing, private sector investments, quality production and productivity, and air freight, sea freight, and ground logistics

across priority value chains. Therefore, the 2019-2024 strategy builds on the success of NAEB to date, capitalizing on the current growth and strength factors while addressing key challenges to boost agriculture exports, and puts forth key interventions to achieve its ambitions for the next six years.

Reaching 1 billion USD in annual exports revenue by 2024 will require doubling down on exports of emerging crops, while steadily growing traditional exports crops. To achieve the ambitious goal of reaching 1 billion USD in ag exports revenue per annum by 2024, NAEB will need to operate differently by building on and scaling-up on past successes and prioritizing key crops that will give Rwanda a competitive advantage. The 2019-2024 strategy, therefore, uses a combination of approaches across international export commodities vs. regional exports crops. International exports growth will be led respectively by (i) exponential growth in horticulture high-value fresh products (French beans, snow peas, passion fruits, chilies, and cut flowers) mainly towards the European market, followed by the Middle East, and the rest of Africa; (ii) continued growth in tea as Rwanda increases its global market share and diversifies into specialty tea, therefore capturing higher value; (iii) steady growth in coffee exports value by increasing sales of specialty coffee; and (iv) increase in pyrethrum exports volumes and value by increasing productivity and diversifying into value addition. Regional exports will grow less rapidly than past trends given expected increased stability in the region but offer tremendous opportunities for growth in specific product segments. Re-export of value-added cereals will continue to grow rapidly in the cereals sub-category. Beyond traditional and emerging export crops, new growth value chains hold the potential to grow in the upcoming years and will be tested out to unlock their potential. These include essential oils, stevia, sericulture, and other premium crops for exports that NAEB may identify in the upcoming years.

Figure 2: Rwanda agriculture export value, past trends and projection



Source: Dalberg analysis; NISR, Yearbook 2017, 2017; NAEB Annual Reports 2012/2013-2016/2017
1 Others include roots and tubers, pulses, and other products from NAEB's strategic business plan 2019-2024, except for new growth value chains
2 Animal products include milk, meat, live animals, hides and skins, fish, and eggs
3 16% growth from 2013-2014 to 2016-2017 does not include the 2017-2018 growth, given the atypical growth in that year, due to review of data collection approaches

To achieve its growth target, NAEB will implement programs across nine programmatic areas, using a market-driven approach to support down the export value chain, as well as supporting

interventions, in line with PSTA IV priority areas. NAEB will focus on nine programmatic areas, of which 3 are cross-cutting to other programmatic areas to support growth in prioritized value chains. These programming areas, as illustrated in the figure and further expanded in the table below, include market linkage, branding, global operator attraction, business incubation, productivity and quality management, logistics and infrastructure coordination; as well as financing, policy and regulation, and strategic analytics as cross-cutting programming areas. Across implementation of these programming areas, NAEB will ensure mainstreaming of thematic considerations including human capital development, knowledge management, environmental sustainability, and gender and youth.

Figure 3: Summary of overall strategic framework

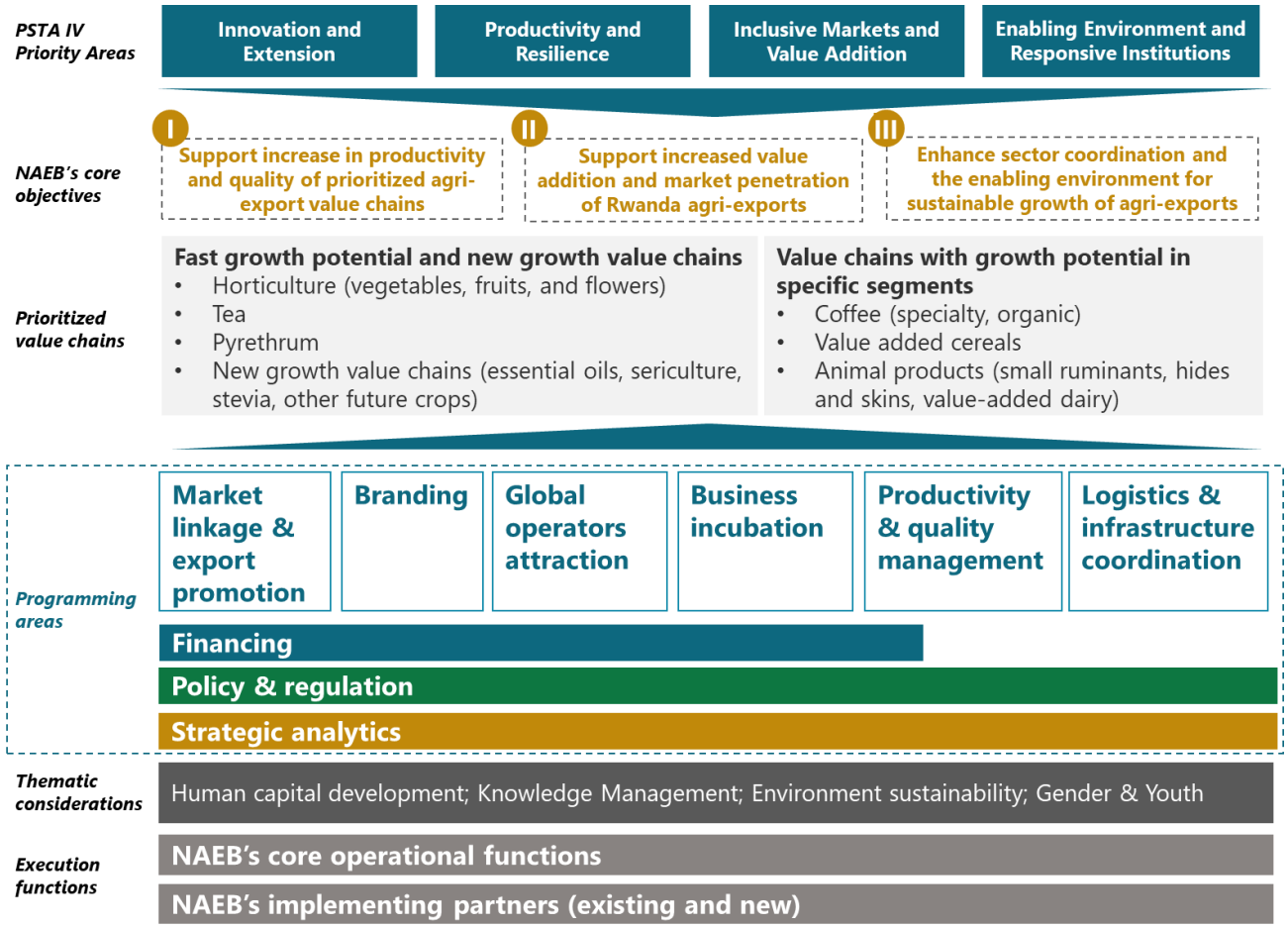


Table 1: Objectives and programs of each programming area

Programming areas	Objectives and programs
Market linkage and export promotion	**Objective:** Create new buyer relationships for different value chains to support market diversification for Rwandan products, and potentially secure higher margins. **Programs:** (i) Develop a market information system (MIS) or decision support model (DSM) for information sharing on key markets for major export products, (ii) support exporters to strengthen relationships with new and existing buyers through trade fairs, forums and one on one meetings, (iii) maintain an active roster of exporters with key information to facilitate buyer negotiations for specific products, (iv) support exports through local physical marketplaces and e-commerce platforms in target markets to diversify market and reach more buyers.

Branding	**Objective**: Increase the visibility of Rwandan brands on regional and international agriculture export markets. **Programs:** (i) Develop and communicate content behind Rwanda brands (ensuring Rwandan products associate with high quality, taste, sustainable, climate and environmental), (ii) enforce compliance with Rwandan brands standards, and (iii) leverage international events in Rwanda and abroad to advertise Rwanda brands.
Global operators attraction	**Objective:** Attract and support prospective operators before, during, and after investments take place. **Programs**: (i) Identify investment opportunities for identified land sites, and develop business cases, (ii) attract global and regional operators to establish in/or co-invest in Rwanda, (iii) support operators in establishing and beginning operations in Rwanda, and (iv) support operators in continuing their operations or expanding their businesses.
Business Incubation	**Objective**: Support small exporters in existing and new growth value chains to grow into successful exporters on the international market and successful businesses, by offering them technical, financial and market support; while supporting ag tech and innovations to catalyze the growth of the sector **Programs:** support (i) early- and mid-stage exporters in established value chains, (ii) innovation experimentation in new growth value chains (proof of concept), as well as (iii) ag technology and innovation with the potential to catalyze ag exports growth
Productivity and quality management	**Objective:** Improve both the quantity and quality of production of agriculture export products by (i) increasing yield, (ii) expanding the land area under cultivation and/or (iii) enhancing post-harvest handling practices that affect the quality of produce after harvesting. **Programs**: (i) Agriculture land mapping and planning, leveraging existing MINAGRI efforts (ii) facilitate exporter-farmer cooperative clusters for increased access to agronomic technical knowledge, quality inputs, and production and post-harvest management infrastructure, (iii) showcase new crops and varieties, new technology, and best agronomic practices through demonstration farms, and (iv) accelerate R&D efforts in key sectors that contribute to the export base.
Logistics & infrastructure coordination	**Objective:** Improve the efficiency of supply chain logistics of export products from production site to export destinations via grouped warehousing and transportation activities. **Programs**: (i) provide infrastructure and logistics support for perishable products (e.g., increase airfreight capacity), and (iii) provide warehousing for non-perishable exports for both international and regional export markets.
Financing	**Objective:** Ensure the availability of appropriate finance for agricultural exports across different sectors. **Programs:** (i) Facilitate understanding of agricultural export businesses by banks and investors and strengthen linkage with agricultural export businesses, and (ii) facilitate input financing schemes for smallholder farmers in specific value chains in collaboration with the private sector.
Policy and regulation	**Objective:** Feed technical inputs into appropriate institutions to influence favorable policy formulation in support of agricultural exports **Programs:** Infuse data, knowledge, and learnings to influence key policies related to (i) productive land access, (ii) regional trade, and (iii) export product quality regulation
Strategic analytics	**Objective:** Provide data-driven insights that will guide NAEB's decision-making into new investments, programs, markets, etc. **Programs:** (i) Data-driven research to support decision-making in other programming areas and (ii) problem-solving and continuous strategy improvement: systemically identify sector challenges and trends that require attention and fast decision-making and develop solutions to enable or facilitate growth.

While NAEB will oversee all programming areas for the strategy and lead the majority of execution, we will strategically leverage new and existing partners where necessary, to support in execution. NAEB's core functions related to export market development and innovation, value chain development and regulation, and finance, planning, and exports services provision are paramount to enable execution of the strategy. In addition to these core functions, NAEB will associate existing partners in and outside of government and will seek new ones to lead, co-lead or support execution of specific programs. By their nature, some programs are well suited for a strong public sector role played by NAEB and other government partner institutions, while others will require third parties with in-depth expertise in specific areas to play a stronger role.

Implementation of the strategy will require 375.2 million USD, to generate 3.77 billion USD in cumulative exports, catalyze private sector investments worth 1 billion USD, support ~200 businesses, and create over 313,000 jobs, while supporting 525,000 farmers. To implement the 2019-2024 strategy, NAEB's budget is estimated at 375.2 million USD, expected from a combination of sources including GoR funding (48%), development partner funding (48%), and internally NAEB's generated revenue (4%). The increase in funding from the previous NAEB's strategy (from 93.3 million USD to 375.2 million USD) aligns with the PSTA 4 budget increase from 848 million USD in 2013-2018 to 3 billion USD in 2018-2024. The funding allocation also aligns with PSTA IV's prioritizations of key strategic objectives, but with a stronger focus on value addition and market (40% of total budget), given NAEB is the main agency in charge of agriculture marketing. At a value-chain level, nascent value chains such as horticulture will require the most incremental costs to yield substantial returns over the period of the strategy and beyond. Finally, the implementation of the strategy over the course of the upcoming five years will have far-reaching economic and social impact on Rwanda, including catalyzing private sector investments worth 1 billion USD, supporting 190 businesses, creating over 313,000 jobs, and supporting 525,000 farmers. NAEB will work closely with key partners to progressively raise funding from development partners to complement GoR funding. In addition, NAEB envisages to become self-sustainable, starting from 2020-2021, in line with its new legal status.

Introduction

SECTION I

ABOUT NAEB

NAEB is a public commercial institution created in 2011 by merging Rwanda's coffee, tea, and horticulture development authorities, to combine efforts and resources to increase agricultural exports. The National Agricultural Export Board (NAEB's) is established as a public commercial institution through Law № 13/2017, under the tutelage of the Ministry of Agriculture and Animal resources with the Board of Directors undertaking strategic oversight and fiduciary responsibility. NAEB emerged from the merger of Rwanda's coffee, tea, and horticulture development authorities, OCIR-CAFÉ, OCIR-THE, and RHODA respectively, in 2011. The merger aimed to combine efforts and resources to increase the country's agricultural export volumes and revenue by attracting private sector investments in the production, processing and value addition of both traditional and non-traditional agricultural commodities for export.

NAEB's mandate is to drive Rwanda's agri-exports revenues growth by supporting exports sector actors across production, value addition, marketing, and policy interventions. NAEB's mandate[1] (as detailed in the figure below) is focused on advising and implementing agricultural export policies, actively supporting quality production and processing of agricultural exports and diversification into new agricultural exports, enforcing quality standards checks and supporting exporters in getting the required certificates, and promoting regional and international market penetration. NAEB relies on the Ministry of Agriculture and Animal resources for policy guidance, resources mobilization, sector capacity building and coordination in the delivery of its mandate.

[1] Govt of Rwanda Law No. 13/2017 and public order 40/01 0f 24/01/2018.

Figure 4: NAEB's mandate

NAEB is mandated by national law
Policy advisory and implementation: • **To advise on the development of policy and strategies for developing exports** of agricultural and livestock products meeting international market requirements • **To implement policy and strategies for developing exports** of agricultural and livestock products meeting international market requirements
Productivity and value addition: • **To work with stakeholders' networks** and **coordinate their activities** in relation to the **processing and export** of agricultural and livestock products • **To provide timely and cost-effective support services required for enhanced international competitiveness** of the private sector in agricultural and livestock exports • **To identify and support research activities** on agricultural and livestock extension regarding exports of agricultural and livestock products • **To identify places for installation of factories and other activities meant for processing** agricultural and livestock products for export • **To put in place strategies designed to provide support and train private operators and cooperatives** involved in export of agricultural and livestock products • **To contribute to investments aimed at increasing production, industries and infrastructure** for adding value to agricultural and livestock products for export
New export products development: **To identify and diversify agricultural and livestock exports** to sustain growth of foreign currency revenues
Quality assurance of exported products: • **To participate in the setting and checking of quality standards for agriculture and livestock export commodities** in collaboration with other relevant institutions • **To issue certificates of authenticity and origin** of agricultural and livestock export commodities
Marketing: • **To collect, analyze and disseminate information on national, regional and international markets** to the concerned stakeholders for use • **To participate in international negotiations and forums** in order to ensure the protection and extension of agricultural and livestock products export market • **To participate in various national, regional and international trade fairs**, in order to promote agricultural and livestock products for export • **To facilitate negotiations for setting and publishing minimum farm gate prices** for agricultural and livestock export commodities in collaboration with stakeholders • **To establish relations and cooperation with regional and international organizations** with the aim of **improving operations and collaboration** with regard to exports of agricultural and livestock products

Since its establishment, NAEB has played a critical role in expanding Rwandan agricultural exports quality and revenue, contributing to Rwanda's development. Rwanda has set an ambitious target to become a middle-income economy by 2035 and high-income status by 2050.[2] To do so, agricultural exports is a key contributor among other sectors, with a goal to grow export revenues annually by at least 12%. Since its creation, NAEB has supported growth of exports revenue significantly, which doubled from 225 million USD in 2013-2014 to 516 million in 2017-2018, at a 22% compounded annual growth rate. These achievements were driven by NAEB's strong leadership in implementing a series of reforms and investments in the agricultural exports to continue growing traditional export products (tea, coffee, Pyrethrum) and developing new emerging value chains such as horticulture, cereals, and animal products. Key achievements within these value chains are further detailed in the value chain performance section.

[2] The World Bank and the Government of Rwanda, 2018, Future drivers of growth in Rwanda

CONTEXT FOR THE 2019-2024 STRATEGY

To deliver on its mandate, NAEB develops six-year strategic plans to guide its efforts towards expanding agriculture exports and to inform the best allocation of scarce resources to support exports growth. NAEB's six-year strategic plans aim to provide guidance to ensure that scarce resources available are allocated to top priorities and provide a partnership framework for public and private sectors to work together to achieve mutually agreed objectives, leading to agricultural export development. For sustainability purposes, strategic plans also emphasize the contribution of the export sector to the overall economic and social development of the country in terms of foreign exchange earnings, employment creation, poverty eradication, regional development, gender equality, the inclusion of disadvantaged groups, and environmental sustainability.

The 2019-2024 strategy builds on the success of NAEB to date and puts forth key interventions to achieve NAEB's ambitions to achieve 1 billion in annual exports revenue by 2024. The 2019-2024 strategy builds on the learnings from the 2013-18 mid-term strategy to provide directions for the next six-years. For this six-year strategic plan, NAEB targets to reach 1 billion USD in annual agriculture export revenues by 2024, focusing on priority growth value chains, leveraging Rwanda's positioning on key markets, and addressing key value chain needs to reach their growth potential. The current strategy outlines the strategic objectives for NAEB, focus value chains, and key programs and supporting interventions to achieve growth.

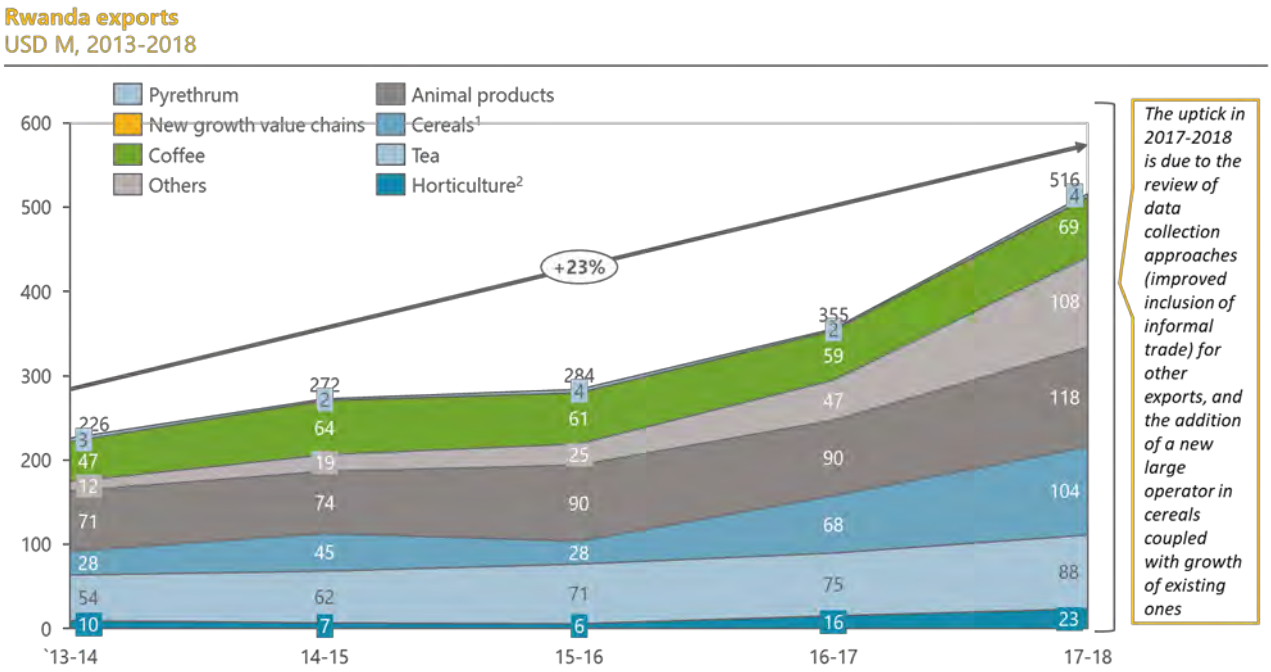
Dalberg idh the sustainable trade initiative

This strategy was developed by Dalberg Advisors and the Sustainable Trade Initiative (IDH), in close collaboration with the National Agriculture Export Development Board's Executive Team, Board of Directors, and broader stakeholders.

I.1 EXPORTS PERFORMANCE AND OUTLOOK

Rwanda's agricultural exports experienced significant growth over the recent years at a compounded annual growth rate (CAGR) of 22% since 2013-2014 to reach 516 million USD in 2017-2018, led by moderate growth in traditional exports (tea, coffee, and pyrethrum) and faster growth in emerging export crops. Rwanda predominantly exported traditional commodities such as tea, coffee, and pyrethrum to international markets, but new high potential export crops have emerged including horticulture, livestock, cereals, and other crops (essential oils, stevia, fish, etc.). Export of traditional commodities grew at a CAGR of 11% between 2013-2014 and 2017-2018 while emerging commodities export grew at a CAGR of 29% within the same period. Among the emerging export commodities, horticulture experienced the fastest growth due to the development of flower parks for export production, and emerging exporters of high-value horticulture crops targeting international markets. Cereals also grew more rapidly than others due to the introduction of local cereals processors to the country. Animal products were the largest export sector accounting for 24% of Rwanda's total agriculture exports, however, grew at a slower rate. Tea remained a key traditional export commodity, its growth mainly driven by the construction of six new tea processing factories in the country. The coffee sector, despite remaining an important cash crop in Rwanda, experienced slower growth in recent years. In efforts to improve productivity and quality, NAEB and other sector stakeholders have expanded the number of coffees washing stations across the country and provided technical trainings to farmers.

Figure 5: Rwanda agriculture export value, past trends



Source: NAEB Strategic Business Plan 2019-2024
1 Others include roots and tubers, pulses, and other products from NAEB's strategic business plan 2019-2024, except for new growth value chains
2 Animal products include 'milk', 'meat', 'live animals', 'hides and skins', 'fish', and 'eggs'

Despite great achievements in overall exports goals, there were shortcomings in value-chain specific objectives from the previous NAEB 2013 – 2018 strategy. Key learnings from the previous strategy inform the 2019-2024 strategy formulation. Under NAEB's leadership, Rwanda's agricultural exports grew rapidly, with annual revenue reaching 516 million USD in 2017-2018, close to the overall goal of 567 million USD set by the previous NAEB strategic plan. Tea and other emerging commodities exceeded or reached close to the targeted projections either in absolute terms or in their pace of growth, while coffee, horticulture and pyrethrum did not meet their targets of aggressive

growth. Tea exports reached 88 million USD in 2017-2018, close to the target of 95 million USD, and grew at a similar CAGR of 7% to the expected rate of 8%, from the 2012-2013 baseline. Coffee exports revenue fluctuated and overall remained at the same level due to shifting global prices and various challenges in the sector. Pyrethrum exports struggled as the sector experienced an unexpected global market shift and plummeting of the price as a result, while horticulture's slower growth could be partly explained by gaps in implementation of planned activities. Meanwhile, other emerging commodities including cereals and animal products experienced substantial growth beyond expected targets, allowing Rwanda ag exports to meet its overall targets. The rapid assessment of the NAEB's performance in the previous strategy points to the need for i) detailed and rigorous analysis on growth drivers to set targets for specific value chains; ii) programming areas that align with new ambitious targets and ensuring appropriate funding in delivery; iii) clearly defined and assigned roles to the implementer (NAEB team or external partner); and iv) aggressive approach in implementation leveraging both NAEB's internal capability and external stakeholders who can accelerate growth. The NAEB Strategic Plan 2019-2024 aims to fill the gaps observed from the 2013-2018 strategic plan, in order to achieve its 1 billion USD annual export revenue goal by 2024.

Specific drivers of growth for each agriculture export commodities over the past six years are detailed in the chart below:

Figure 6: Growth drivers of each agriculture export commodity from 2013-2014 to 2017-2018

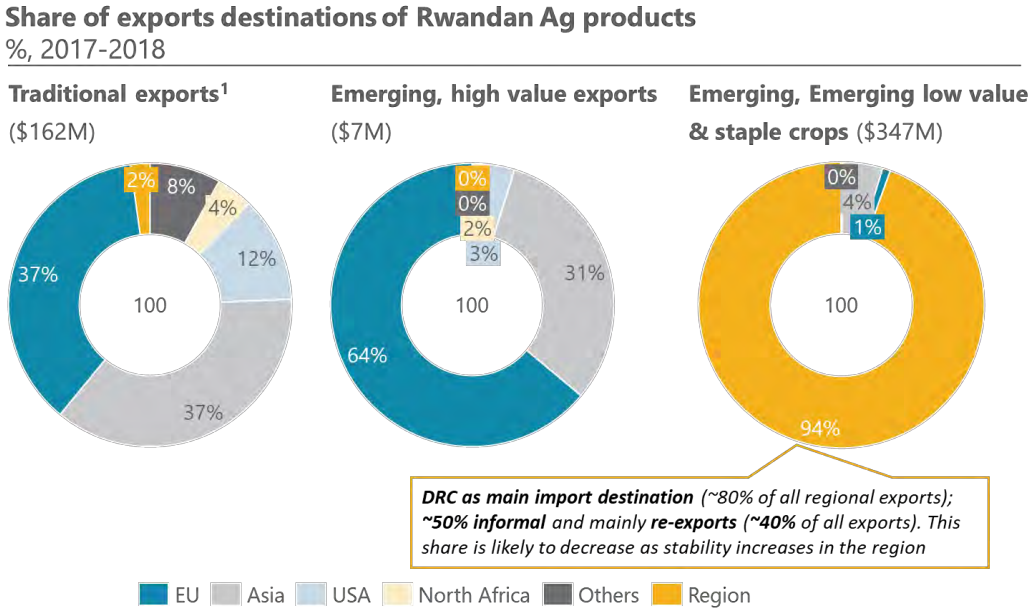
Sub-sectors	Growth drivers
Tea	• Expansion with **five new factories** and another three in the pipeline with over 20,000 ha • Tea **diversification**: Orthodox, organic and green tea
Coffee	• **Increased production** from 17,000 to 24,000MT • **Improved quality** from 30% to 69% fully washed coffee of total production
Pyrethrum	• **Market diversification** from US, to include the EU and China • GoR policy mandating farmers to **intercrop pyrethrum with Irish potatoes** in certain areas
Horticulture	• GoR spending in **irrigation infrastructure**, **cold-chain**, **pack house**, **Air freight** (RwandAir), **floriculture**, and **high value crops** (French beans, snow peas, chilies etc.) • **Support for exporter competitiveness**: certification system, competitive air freight charges through current MOU between NAEB & Rwandair.
Cereals	• **Crop intensification program**, irrigation schemes • Introduction of **industrial players enabling value-added products** exports and re-exports
Animal products	• **Animal products intensification program** • **Gako Beef Integrated Project**
Others	• **GoR support for new growth value chains**: Stevia, essential oils, honey, sericulture, etc.

EU is the main export destination for traditional and high-value exports including tea, coffee, pyrethrum, and increasingly horticulture, followed by a few Asian countries which mostly import tea and horticulture products. Rwanda exports over 52% of its tea to Asia and 28% to the EU. Rwanda exports over 60% of its coffee to the EU, 20% to the US, and in smaller quantities to the Asia/Pacific region. Rwanda has diversified its export markets for pyrethrum beyond the US, to cover the EU and

Asia. While most horticulture exports were regional, high-value horticulture crops including flowers, French beans, chilies, and passion fruits exports went to the EU market.

The region – East Africa and other surrounding neighbors – dominates low value and staple crop export markets, with DRC as the largest buyer in the region as it accounts for 80% of all of Rwanda's regional exports. DRC bought 75% of low-value horticulture exports and 99% of all cereals exports. Rwanda also continued to provide live animals and meat, fish, meat, and dairy to DRC, while also exporting milk to Sudan, South Sudan, and Tanzania in smaller volumes. 50% of these regional exports were informal in nature, and 40% were re-exports.

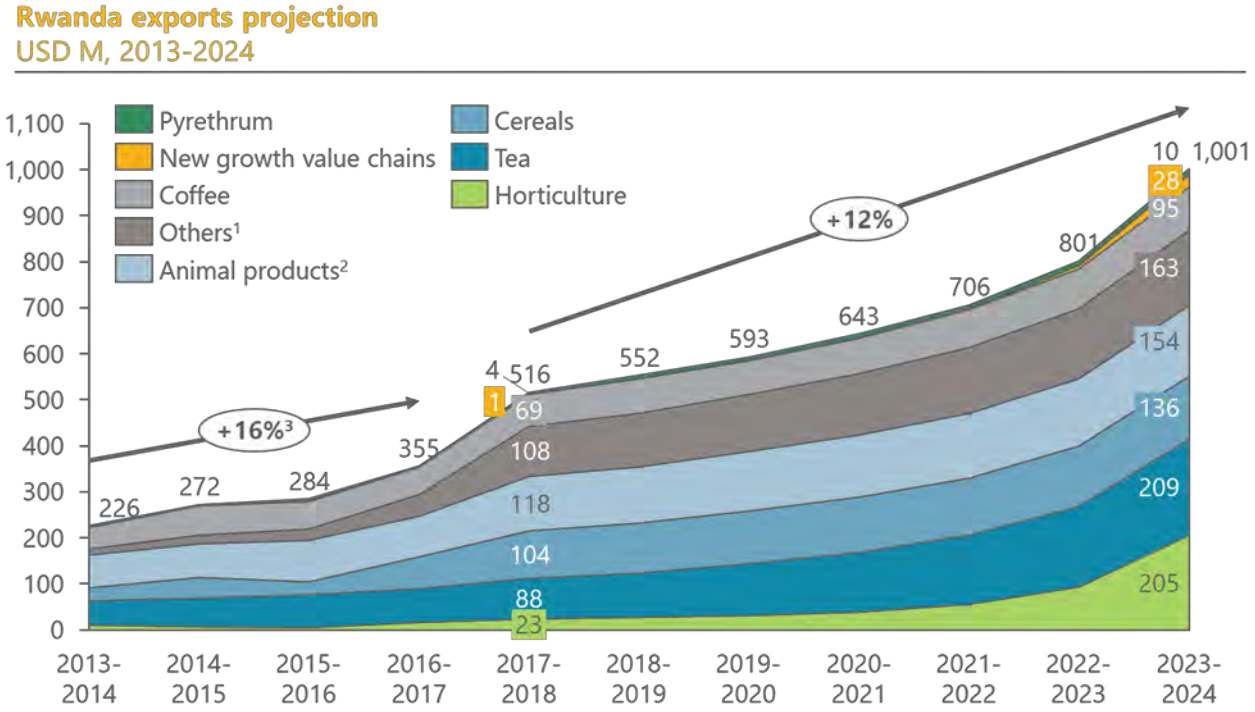
Figure 7: Rwanda agriculture products' export destinations



1:Traditional exports are Tea, coffee, Pyrethrum, while other crops are emerging as exports products for Rwanda
NAEB Annual data 2017/2018

Over the upcoming six years, Rwanda's agriculture exports are projected to reach 1 billion USD in annual exports revenue by 2024. This will require doubling down on exports of emerging crops, while steadily growing traditional exports crops. To achieve the ambitious goal of reaching 1 billion USD in ag exports revenue per annum by 2024, NAEB will need to operate differently by building on and scaling-up on past successes and prioritizing key crops that will give Rwanda a competitive advantage. International exports growth will be led respectively by (i) exponential growth in horticulture high-value fresh products (French beans, snow peas, passion fruits, chilies, and cut flowers) mainly towards the European market, followed by the Middle East, and the rest of Africa; (ii) continued growth in tea as Rwanda increases its global market share and diversifies into specialty tea, therefore capturing higher value; (iii) steady growth in coffee exports value by increasing sales of specialty coffee; and (iv) increase in pyrethrum exports volumes and value by increasing productivity and diversifying into value addition. Regional exports will grow less rapidly than past trends given expected increased stability in the region but offer tremendous opportunities for growth in specific product segments. Re-export of value-added cereals will continue to grow rapidly in the cereals sub-category. Beyond traditional and emerging export crops, new growth value chains hold the potential to grow in the upcoming years and will be tested out to unlock their potential. These include essential oils, stevia, honey, and new exports products that NAEB may identify in the upcoming years.

Figure 8: Rwanda agriculture export value, past trends and projection



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I.2 AGRICULTURE EXPORTS OPPORTUNITIES AND CHALLENGES TO ACHIEVE GROWTH OBJECTIVES

Overall agriculture exports opportunities and challenges

Strong institutional capacity and market competitiveness are the main strengths of Rwanda's agriculture exports; However, challenges related to logistics, human capital, and private sector investments need to be overcome to leverage its full potential. A summary of the agricultural exports sector's strengths and challenges are included in the figures below.

Figure 9: Strengths of Rwanda's agriculture exports

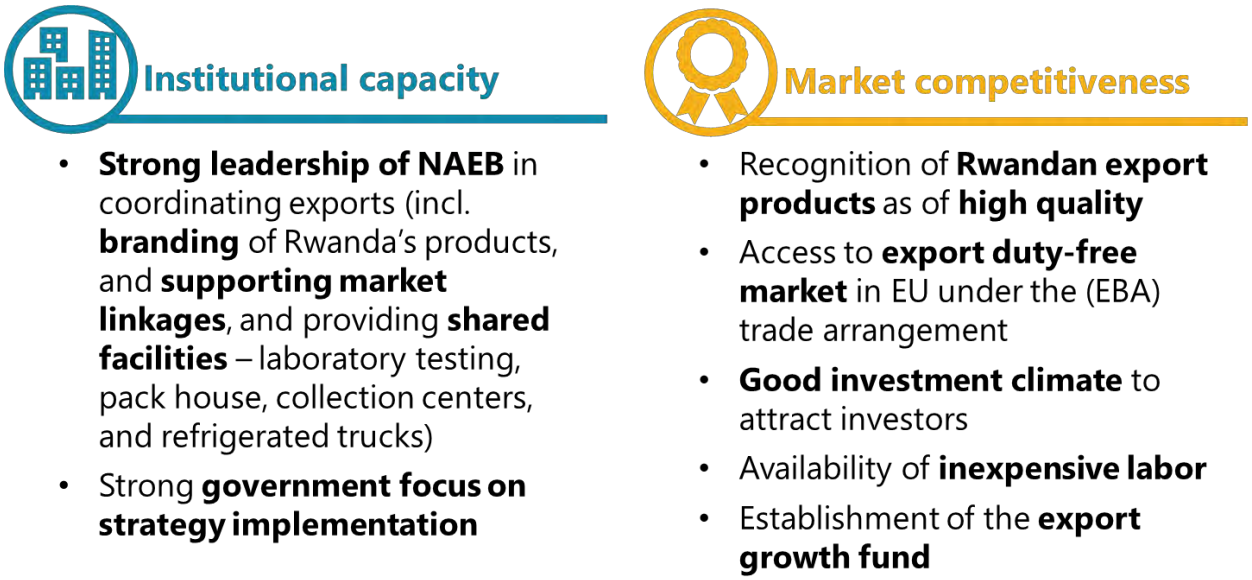
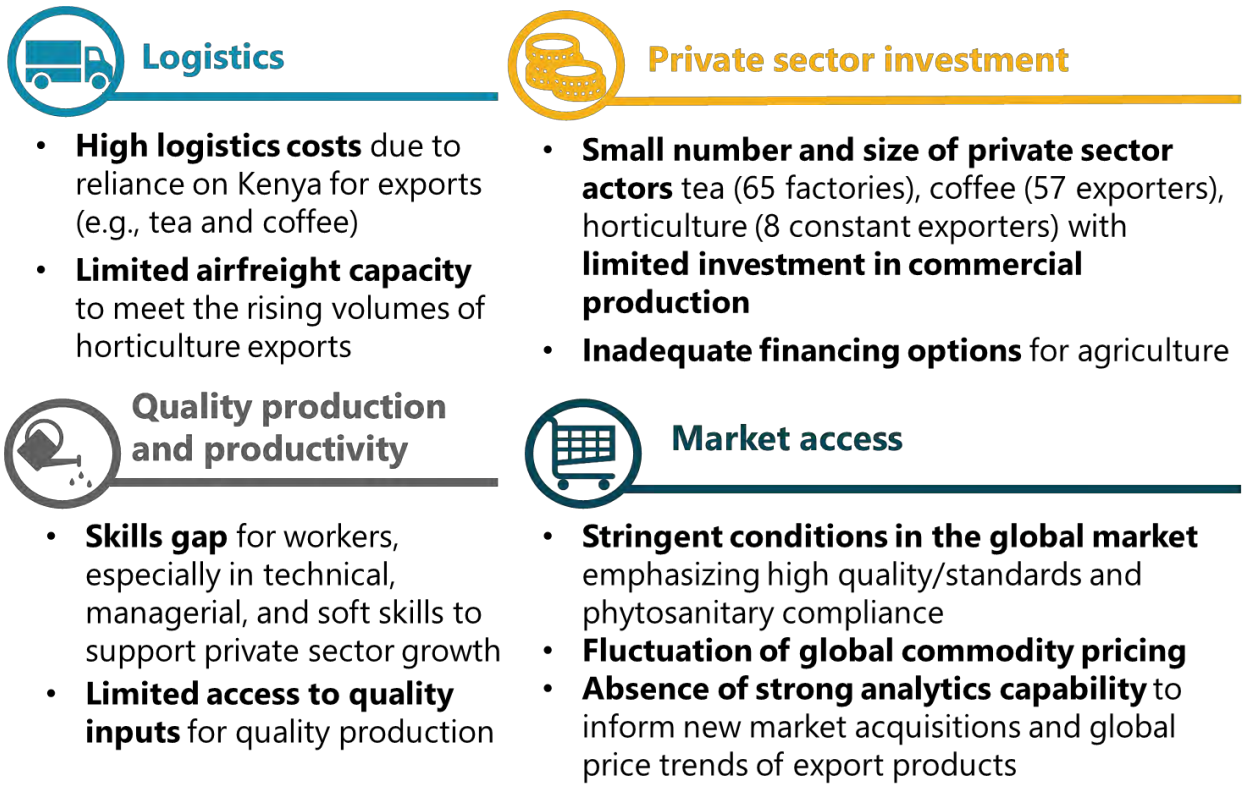


Figure 10: Challenges in Rwanda's agriculture exports



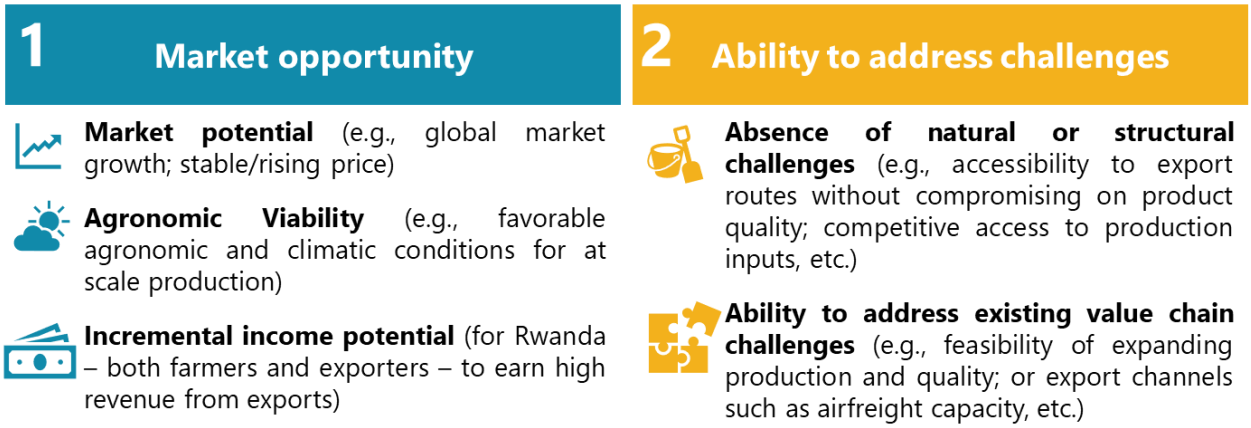
Apart from the overall opportunities and challenges that Rwandan agriculture sector as a whole face, each value chain also has specific opportunities and challenges, which are explored in the next paragraphs.

Value chain specific opportunities and challenges and prioritization

Priority value chains for the strategy are assessed based on their market opportunity to help reach the 1 billion exports target, and Rwanda's ability to address challenges in the value chain. A market

opportunity for a crop can be defined by positive market trends, appropriate agronomic conditions, and potential to bring incremental income to Rwanda. Natural or structural challenges are usually imposed by Rwanda's natural environment constraints such as the hilly landscape, the landlocked nature of the country limiting sea freighting for high weight perishable crops, and therefore relatively difficult to address. Other challenges are often driven by the nascency of the value chain or limited resources (financial, knowledge, and human), which are often addressable. These two criteria, as further described below, guide the prioritization for high-potential value chains that will be a focus for the strategy.

Figure 11 Value chain prioritization criteria



Based on these criteria, we assessed different value chains in Rwanda exports. These value chains fall within two categories: (1) high potential value chains, and (2) value chains with opportunities in specific segments. I addition to these two categories, NAEB may identify new growth value chain in the upcoming years to keep diversifying and strengthening the exports base. The table below summarizes the assessment of value chains, which is further expanded in subsequent paragraphs.

Figure 12: Value chain prioritization assessment

Value chain	Market potential	Ability to address challenges	Summary Assessment
Horticulture			Given high market potential, and Rwanda's ability to address key challenges, horticulture exports will continue to grow rapidly
Tea			Continued growth of the tea market coupled with Rwanda's best quality tea present growth opportunity for the Rwanda tea sector
Pyrethrum			Natural advantages for Rwanda in pyrethrum coupled with market growth will drive pyrethrum and essential oils exports, if Rwanda improves productivity
Coffee			Despite global price challenges, the ability to increase value chain efficiency and diversification into specialty coffee can support export growth
Cereals			Rwanda's cereals exports can increase potential by focusing on re-export of value-added products and improving domestic yields
Animal products			Rwanda's meat and dairy sectors are fragmented and inefficient to achieve economies of scale required for mass production and exports
New growth value chains			Nascent value chains such as essential oils, sericulture, and stevia show have positive global market outlooks and fetch high prices. NAEB may identify other new value chains in the upcoming years.

Low Potential in specific segments Medium High

Value chain opportunities and market potential

To achieve the $1 billion agricultural exports goal, Rwanda needs to strategically focus its resources on areas where opportunities lie within each value chain (e.g., product lines and target markets) and fully capitalize those opportunities. High value and traditional agricultural export products will continue to target the international market, mainly the EU but also increasingly the US, Middle East, Asia, and to the rest of Africa (West and Southern Africa). Low value and high-volume commodities will continue to serve the regional market. Below is the summary of the specific value chain and market opportunities, and specific segments within value chains that will receive the most focus from NAEB in the next six years. Detailed value chain assessments and market potential are included in Annex IV.1.

Value chains with fast growth potential

- **Horticulture: The global market for fresh fruits and vegetables is projected to continue its growth trend at a CAGR of 6% (reaching 5.4 trillion USD in 2030)** [3] **due to increasing consumer preference and health awareness for diversified, fresh products.** Europe and the Middle East will continue to dominate the global demand for fresh horticulture products. Given Rwanda's ability to address key challenges, horticulture exports will continue to grow rapidly. Exports will also continue to diversify towards the rest of Africa (mainly Western and southern Africa)
- **Tea: The global tea market is projected to grow at a CAGR of 5.75% from 2017 to 2024 (reaching 73 billion USD),**[4] **driven by both continued growth in black tea exports and rising demand for new diversified tea categories.** Rwanda's tea holds a unique quality and is well-positioned to take advantage of the global tea market trends towards specialty tea. Focus markets will remain, Asia, Europe, and increasingly North Africa.
- **Pyrethrum: The global pyrethrum market is projected to grow at a CAGR of 6.4% from 2017 to 2026 led by rising demand both for natural insect repellent products (expected to reach 3.7 billion USD by 2026) and organic pesticides in agriculture (global market to reach 279 billion USD in 2023).** The market price is expected to stabilize in the coming years as the global demand grows and the buyers become more diversified. This trend presents opportunities for continued exports of pyrethrum extracts to Asia, the EU and the Americas while diversifying into local value addition to produce and export ready-to-use organic pesticides, both for regional and export markets.[5]

Value chains with growth potential in specific segments

- **Coffee: The global coffee market grew slowly at a 1.26% annual rate between 2014 and 2017 but is projected to grow at a CAGR of 5.3% from 2019 to 2024, with rising demand for diversified products including organic, specialty, and single origin coffee.** Global coffee prices are often volatile, with a recent downward trend, but specialty coffee can fetch a price premium of about 21% for African coffee. Diversification into higher value coffee can support Rwanda's export growth.
- **Cereals: Rwanda can best increase its cereals export revenue by targeting value-added cereals (e.g. maize flour) and increasing productivity without expanding the land area under production dedicated to exports.** The regional market for milled cereals is limited outside

[3] Fruit Logistica, 2018, Trend Report : Disruption in fruit and vegetable distribution
[4] Statista, Accessed March 2019, Global tea market size 2017-2024
[5] Allied Market Research, 2018, Global organic pesticides market expected to reach $279,195 million by 2023

DRC (with a total market worth 40 million USD), which is the major buyer in East Africa and to which Rwanda currently supplies over 74% of its import. The value-added re-export category holds potential in the upcoming years.

- **Animal products: Animal products exports grew at a CAGR of 11.15% in the past six years but are projected to show a slower growth** as they heavily rely on the regional demand built on instability, and the feed shortage will increasingly become a major bottleneck as the sector expands. There is opportunity for diversification from live animals to fine cuts as they have the potential to gain access to international and regional markets currently served by RwandAir, and small ruminants exports.

New growth value chains

Some of the nascent value chains in Rwanda, including essential oils, stevia, and other new value chains that NAEB may identify in the upcoming years are worth looking closely into as they both have positive global market outlooks and fetch high prices.

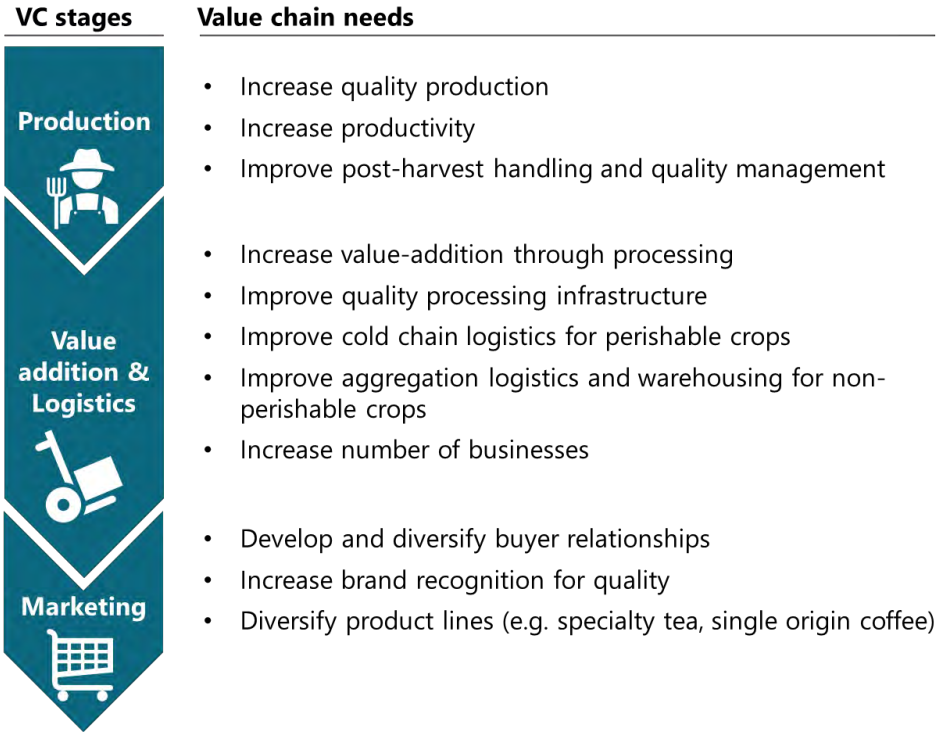
- **Essential oils: The global essential oils market is projected to grow at an 8.83% CAGR from 2017 to 2022 mainly led by demand in food and beverages and spa and relaxation industries, but also their versatile applications in perfumes, pharmaceuticals and cosmetics.**[6] While most of Rwanda's essential oils are currently sold in the region and increasingly to Europe, Rwanda has potential to serve the international market if it can produce sufficient volumes to supply the rising demand in the Asia Pacific and the US.
- **Stevia: The global market for stevia is projected to grow from $492 million in 2018 to $818 million by 2024,**[7] **with increasing health awareness and food and beverage industries shifting to natural sweeteners.** There is an opportunity for local processing and therefore a higher revenue margin if Rwanda can secure a production volume large enough to run an extraction factory.

Value chain challenges and Rwanda's ability to address such challenges

To taking advantage of Rwanda's competitiveness in growing markets, specific value chain needs, and challenges must be addressed to achieve each sub-sector's potential growth. Value chain needs are spread across the supply chain as summarized in the figure below.

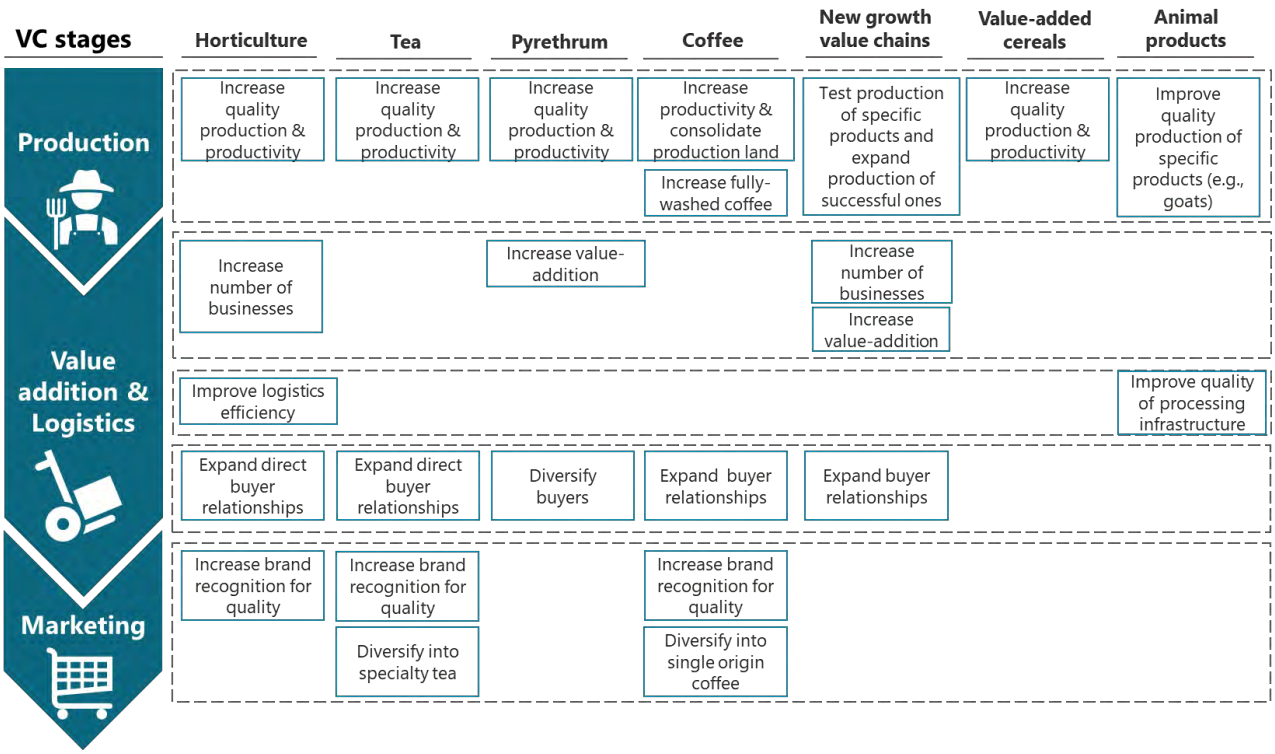
[6] Statistics MRC, 2017, Global essential oils market report, size, share, analysis 2017 and forecast to 2023; Dalberg analysis, 2019
[7] IMARC, Stevia Market: Global Industry Trends, Share, Size, Growth, Opportunity and Forecast 2019-2024

Figure 13: Summary of value chain needs



Some of these needs are faced across several value chains, while others are only relevant to a few. Specific value chain needs are summarized in the figure below and expanded in annex IV.1.

Figure 14: Value chain needs in each stage of value chain processes, by crop/sector



Challenges in tea, new growth value chains, horticulture, and pyrethrum respectively show the greatest potential to be addressed while those in coffee, cereals, and animal products cannot be fully controlled by Rwanda.

- **Horticulture: There is a high potential to** increase the quality and quantity of horticultural crops with increased sector coordination in Productivity and quality management, and possibility to increase air freight capacity through attraction of global air cargo operators, utilization of the currently untapped cargo space, and with the new Bugesera airport.
- **Tea: Rwanda can increase tea yield** through facilitating access to inputs by farmers, capacity building, and more R&D efforts. In addition, Rwanda can increase exports via increased market linkage efforts and fetch higher prices given its high-quality tea.
- **New growth value chains:** There is room for capacity building and attracting operators to address challenges on low production and processing capacity and limited farmer knowledge on these crops due to their nascency in Rwanda. There is also opportunity for increasing private sector engagement in these value chains through different engagements such as business incubation.
- **Pyrethrum: Investment in capacity building of farmers** on production best practices such as the use of fertilizers can solve the issue of low productivity. There is also opportunity for market diversification through increased market linkages and local value addition which can lead to increased export prices
- **Coffee**: **Rwanda has little control over fluctuating global prices and scattered production areas and aging trees** puts Rwanda at a disadvantage in terms of competing on the global market with large-scale producers. **Diversification into specialty/higher value coffee** can be supported through sector coordination initiatives.
- **Cereals**: Issues of low yields and limited post-harvest handling knowledge can be partly addressed, and capacity can be addressed with efforts into farmers capacity building, although Rwanda cannot reach large scale production of cereals due to the hilly landscape. However, Rwanda can increase cereals exports by **focusing on value-added cereals re-exports**.
- **Animal products:** Limited capacity for local feed production given low levels of cereal production pose challenges with Rwanda's competitiveness for animal products. Small grazing animals require less feed, but to export to the biggest potential market, the middle east, will require sea transportation via neighboring countries and can put Rwanda at a disadvantage for live animals which are mostly in demand. Existing initiatives in place to **improve production and productivity in animal products** such as the Gako integrated beef project and cattle genetic improvement can help increase competitiveness in specific segments.

Strategic objectives for 2019-2024

SECTION II

II.1 STRATEGIC VISION

Strategic vision summary

Strategic priorities

NAEB's strategic business plan (SBP) 2019-2024 aligns with Rwanda's Plan for Agricultural Transformation (PSTA IV), with an increased focus on marketing across priority value chains explored in the section above. Rwanda's PSTA IV puts forth four priority areas and seeks the "transformation of Rwandan agriculture sector from a subsistence sector to a knowledge-based value creating a sector that contributes to the national economy and ensures food and nutrition security in a sustainable and resilient manner". The NAEB strategic plan 2019-2024 aligns and measures its activities against internal core objectives deriving from PSTA IV. These include: (i) improved quality and supply of quality agri-export products to the markets; (ii) sustained agri-export markets and increased revenues from agri-export products; and (iii) sustainable and functional institutions to meet agri-export market demand.

Strategic objective 1: Support an increase in productivity and quality of prioritized agri-export value chains. This strategic objective will result in reduced post-harvest losses, continuous supply of Rwanda agri-export to the market and increased demand for our products and hence gain trust from buyers of respective products.

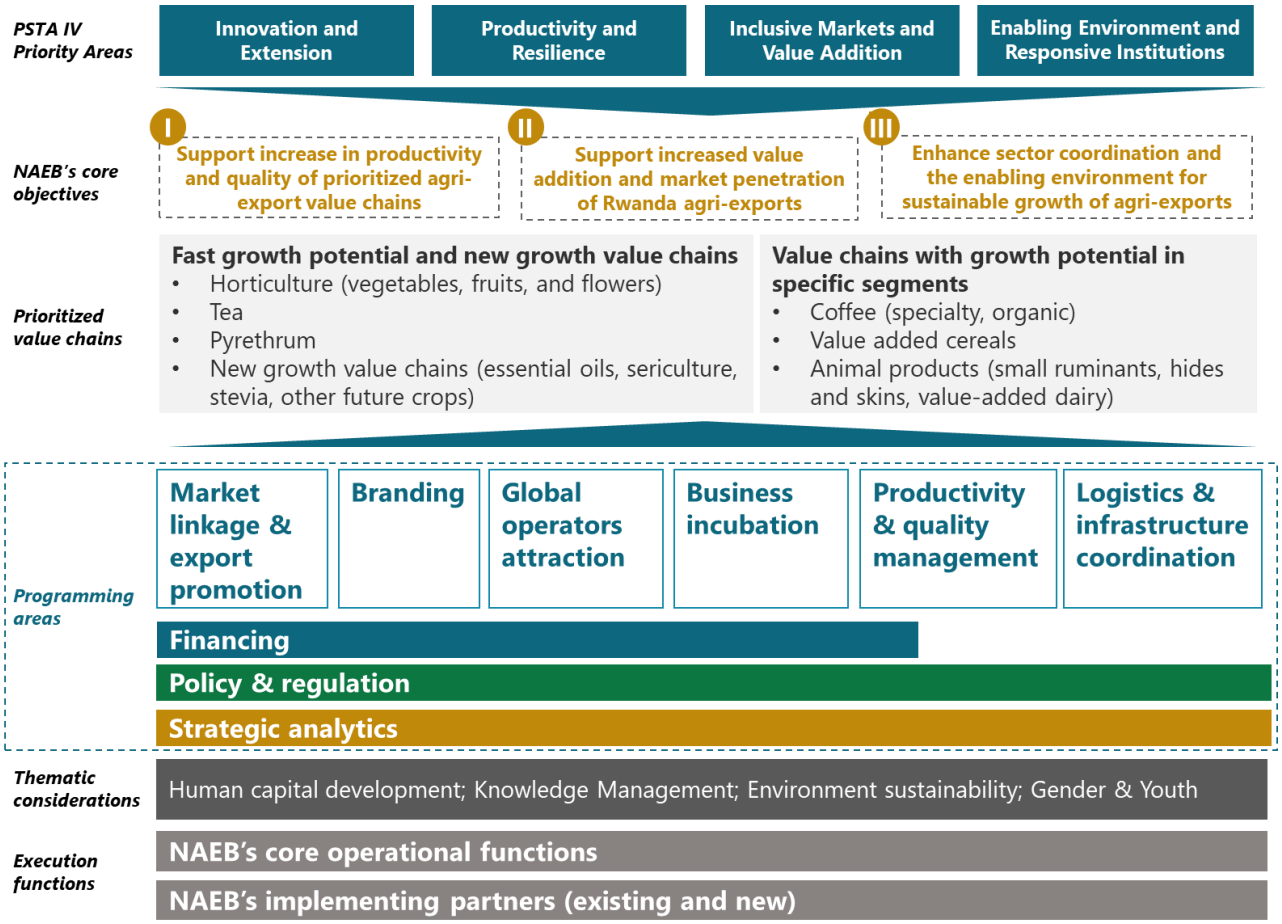
Strategic objective 2: Support increased value addition and market penetration of Rwanda agri-exports. This strategic objective will receive closer attention than traditionally and will ultimately lead to increased contribution of agri-exports to the country's balance of payments and good visibility of prioritized Rwanda agri-export brands on international markets. The cost of engaging in international trade will also reduce as a result of intelligence studies, adopting the use of efficient and effective export logistics, market linkages and adoption of online trading platforms.

Strategic objective 3: Enhance sector coordination and the enabling environment for sustainable growth of agri-exports. This strategic objective will lead to effective personnel and institutional coordination mechanisms in production, value addition and marketing services to grow the prioritized agri-exports.

To deliver on its Mandate, NAEB will need to operate differently by building on and scaling-up on past successes and prioritize key value chains that will give Rwanda a competitive advantage. Our strategic framework to grow Rwandan agriculture exports will focus on fast growth value chains (including identifying and developing new ones) and niche opportunities within value chains with growth potential in specific segments. Prioritized value chains will benefit from nine programmatic areas, using a market-driven approach to support down the export value chain, as well as supporting interventions. These programming areas, as illustrated in the overarching strategic structure below and further expanded in the next section. These include branding, market linkage, global operator attraction, business incubation, quality production, and productivity management, logistics and infrastructure coordination; as well as financing, policy and regulation, and strategic analytics as cross-cutting programming areas. Across execution of these programming areas, NAEB will ensure mainstreaming of thematic considerations including human capital development, knowledge management, environmental sustainability, and gender and youth. NAEB will implement these

initiatives, leveraging new and existing partners in government and outside of government based on specific needs for each program. The strategic framework is illustrated in the figure below.

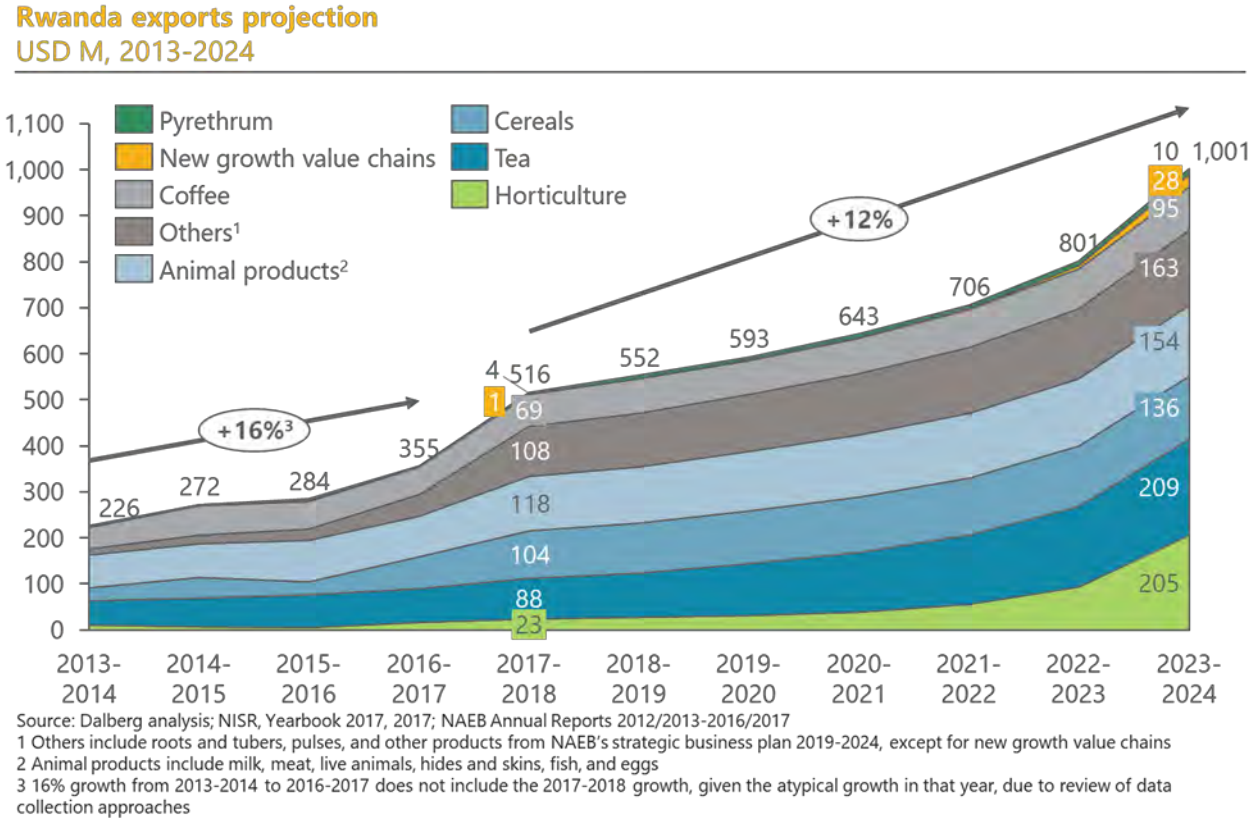
Figure 15: Summary of overall strategy framework



Export growth projections

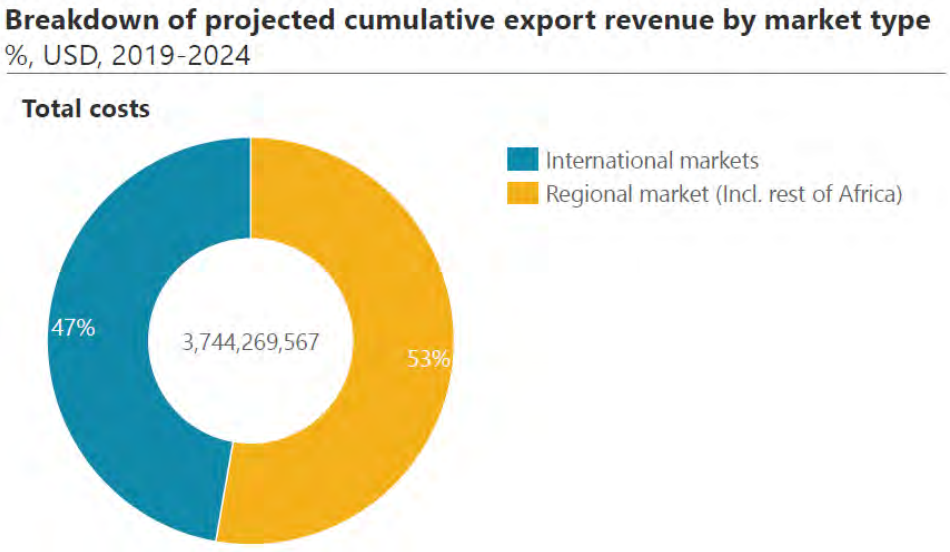
In line with prioritized value chains, Rwanda's exports are projected to reach $1 billion annually by 2023-2024, led by exponential growth in horticulture, rapid growth in high-quality tea, and steady growth in many other sectors. The market outlook for Rwanda's positioning in regional and international exports reveals strong export potential for Rwanda in horticulture, tea, pyrethrum, as well as new potential growth value chains (e.g., essential oils, stevia, etc.). In addition to these, specific segments of growth potential exist with coffee (specialty coffee), cereals (value-added re-exports), and animal products (small grazing animals such as sheep and goat). Horticulture growth will be led by high-value crops exports to the European market and in smaller quantities to the regional and middle eastern markets, while tea will continue its fast growth rate as Rwanda increases productivity and diversifies progressively into specialty tea. Pyrethrum growth will come from increased market diversification for pyrethrum extract exports and diversification into value-added products such as insect repellents and organic pesticides for agriculture. Coffee will grow slowly after production consolidation and land re-allocation for aging trees. Cereals exports growth continue at a slower rate as the region stabilizes and Rwanda continues re-exporting through value addition. Animal products exports will grow similarly to that of cereals.

Figure 16: Rwanda agriculture export value, past trends and projection



Although key growth value chains are focused on international markets, the regional market will continue to represent a significant portion of projected export revenues.

Figure 17: Breakdown of export revenue by market



Growth in annual export value will result from increased export prices of high-quality and specialty products for crops such as tea and horticulture, combined with growth in productivity and production. Export value growth will not translate into a similar volume growth rate for all products. While products such as value-added cereals and animal products will undergo insignificant changes, products such as tea, coffee, and pyrethrum can fetch higher prices for a portion of exports via

diversification into specialty or higher quality products. Volume growth projections required to achieve export revenue targets are outlined in the table below, while detailed growth assumptions for each value chain is detailed in the following table.

Table 2: Export volume (kg) projections by commodity

Commodity	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024
Horticulture	28,308,944	28,867,312	30,367,526	33,501,950	39,198,847	52,675,902	92,535,175
Tea	27,006,190	30,434,956	35,810,398	41,063,891	47,404,792	55,221,183	65,099,107
Pyrethrum	23,262	25,000	27,464	30,171	33,145	36,411	40,000
Coffee	20,094,527	20,867,642	21,824,392	22,825,006	23,871,498	24,965,970	27,371,400
Cereals	237,686,941	243,959,047	250,396,662	257,004,153	263,786,003	270,746,814	277,891,307
Animal products	56,926,010	58,106,592	59,311,659	60,541,717	61,797,286	63,078,893	64,387,079

International exports will register the highest growth in value from current $61 million to $120 million by 2024, mainly led by horticulture and tea. Regional exports will grow less rapidly than past trends given increased stability in the region but offers tremendous opportunities for growth, such as value-added cereals. Detailed assumptions for growth projections of each value chain are outlined below:

Table 3:Summary of growth projection assumptions by sub-sector

Sub-sectors	*Growth projection assumptions*
Horticulture	• **Exponential growth in high-value crops (Chili, French beans, flower, grapes, macadamia, mushroom, and passion fruit) export value,** capturing **3% of the EU market by 2024** • **High-value crops to increase in yields** (by 20%) and area planted to produce target volumes • **Other horticulture crops' export to grow linearly,** both in volume and value at the historical growth rates
Tea	• **Continued growth in total tea export volumes,** reaching 3% of the global market by 2024 • **Diversified teas exported volumes to increase,** reaching 20% of the total tea exported volumes from Rwanda • **Specialty tea to fetch a premium price of at least 35% above black tea prices**
Pyrethrum	• **Export value to grow at the same rate as the global market demand** as NAEB strengthens existing trade partnerships and explores new ones • **Area planted to remain constant** at 3,000 ha while **yield to increase progressively** from current 0.5 MT/ha to 0.8 MT/ha • Pyrethrum extract to fetch an average price of $250
New growth value chains	• **Stevia, essential oils, honey and other newly identified value chains to experience fast growth** as they benefit from NAEB continued support and targeted investments • Stevia and honey to grow at 50% of the historical growth rate for new growth value chains, and essential oils to grow at the global market CAGR •

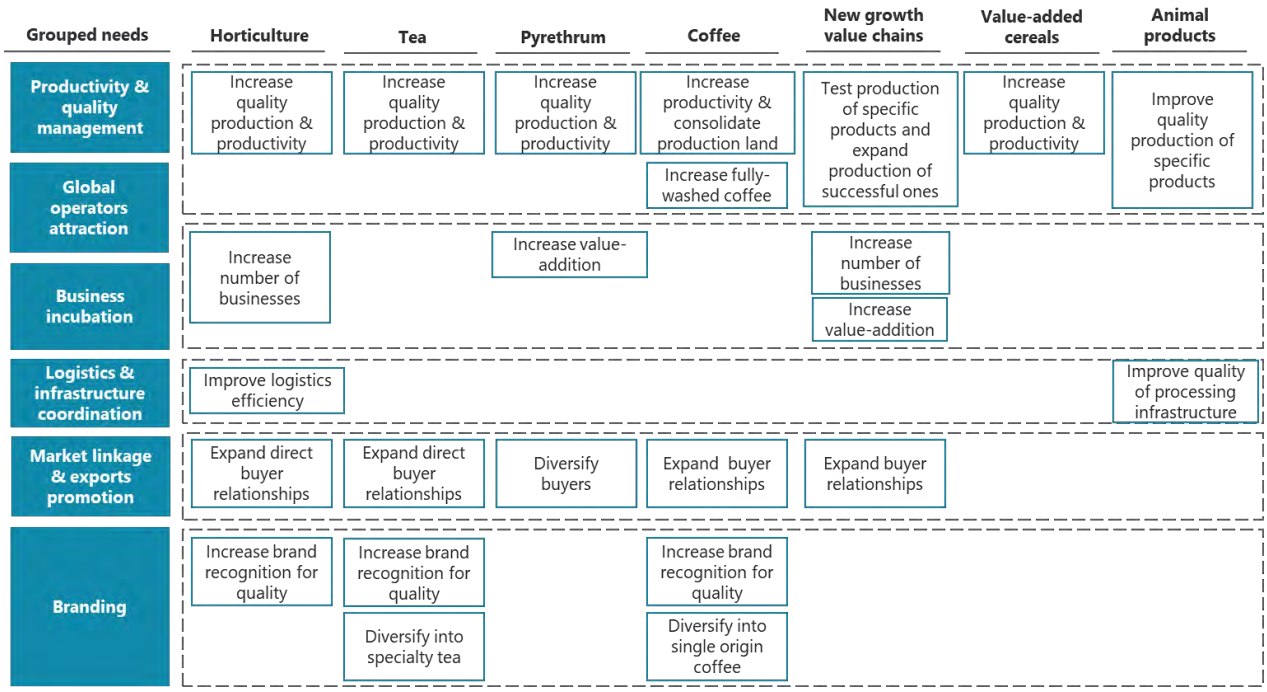
Coffee	• **Steady increase in coffee exports value** as the **specialty coffee exports increase** to be 25% of total coffee exports and **fetch higher prices** • **Area planted to reduce** by 5% while **yield increases progressively** at a 5% annual rate from current 0.5 MT/ha to 0.7 MT/ha by 2024 • **Conventional coffee price to remain constant** at the average price between 2012 and 2017
Cereals	• **Export of processed cereals to grow at a slower rate than the historical trend** as the regional instability decreases and given Rwanda is not a surplus producer of grains • More focus on **re-exports of value-added products** • **Less focus on producing cereals for exports** (but for food security) to prioritize land for high-value crops • **Yields to increase** in current areas planted
Animal products	• **Export of value-added livestock products to grow at a slower rate than the historical trend** • **Faster growth in small grazing animals** and derivatives, and in dairy added products
Others	• **Slower growth rate** as the regional instability decreases and low-value, regional crops to decrease in export values

II.1 PROGRAMMING AREAS & INTERVENTIONS

Programming areas summary

Key export value chains have similar needs to reach targeted growth; these needs can be grouped into six main programs. Specific value chain needs can be grouped into six main programs including Productivity and quality management, global operator attraction, business incubation, logistics and infrastructure coordination, market linkage, and branding. These grouped needs are illustrated in the graphic below and inform program details in the following section.

Figure 18: Grouped value chain needs



NAEB will use a market-led approach to transform and grow Rwanda's producers from supply-driven exporters to market-led and knowledge-intensive exporters. Programs cut across priority value chains with a varying level of focus on value chains based on their specific needs and potential. NAEB has traditionally offered similar services, but with a stronger focus on production and logistics and infrastructure services. To transform and grow Rwanda's producers from supply-driven exporters to market-led and knowledge-intensive exporters and achieve its ambitious exports goals will require a more aggressive market-led approach to ensure that market needs, trends, and requirements inform efforts in production and logistics coordination. NAEB will, therefore, strengthen its marketing capacity, adopt initiatives that will attract both international and domestic investors in agri-export emerging opportunities, increase production, and support agri export stakeholders to enhance productivity and meet international markets food safety requirements. Further, business incubation is particularly important to increase the size of private sector activity in emerging sectors such as horticulture, in order to keep track with sector growth targets. Setting up strategic partnerships with buyers in Europe and the Middle East, as well as with some Asian countries such as China and South Korea, will help Rwandan producers expand their market outreach.

Figure 19: Programming areas summary and value chain focus

	Market linkage	Branding	Global operators attraction	Business incubation	Productivity & quality management	Logistics & infrastructure coordination
Horticulture (216 m)	✓	✓	✓	✓	✓	✓
Tea (189 m)	✓	✓	✓		✓	✓
Pyrethrum (10 m)	✓	✓	✓	✓	✓	
Coffee (75 m)	✓	✓	✓		✓	✓
Processed cereals (151 m)					✓	✓
Others (150 m)	✓	✓	✓	✓	✓	✓
Animal products (161m)					✓	✓

Intensity of intervention High Medium Limited

These programming areas will be supported by other cross-cutting areas within NAEB's mandate, to ensure an enabling environment for programs to thrive. In addition to value-chain oriented programming areas, other programming areas are underlying or cross-cutting in their nature and come in support of the value chain programmatic areas. These cross-cutting programming areas relate to financing, policy and regulation, and strategic analytics.

While NAEB will oversee all programming areas and lead the majority of execution, we will strategically leverage new and existing partners where necessary, to support in execution. NAEB's core functions related to export market development and innovation, value chain development and regulation, and finance, planning, and exports services provision are paramount to enable execution of the strategy. In addition to these core functions, NAEB will associate existing partners in and outside of government and will seek new ones to lead, co-lead or support execution of specific programs. By their nature, some programs are well suited for a strong public sector role played by NAEB and other government partner institutions, while others will require third parties with in-depth expertise in specific areas to play a stronger role. The figure below outlines key NAEB's role in implementation and guide the allocation of different programs within NAEB and key partners, in the detailed programming areas description.

Figure 20: Framework on key NAEB roles in implementation

Key NAEB roles	Description
Lead	• **Lead the execution** of programs within NAEB's mandate • This **may include co-leading with key partners** when the program requires complementary capabilities best provided by other government or non-government partners
Oversee	• Outsource implementation of programs within NAEB's mandate by selecting **supporting partners to implement programs** • In other cases, **other Government partner institutions may be best positioned to lead** implementation while NAEB plays a strong advisory role given importance of the program to boost g exports • NAEB will keep **close collaboration with designated partners** during the implementation, in a coordinator or key decision-maker role
Promote	• Promote implementation of **programs that are outside NAEB's mandate** • NAEB will leverage its knowledge and experience to **draw key partner's attention** on the need to implement such interventions and **influence** the way the programs are implemented

Value chain-oriented programming areas detail

Value chain-oriented programming areas are summarized in the table below and detailed in the following sub-sections.

Table 4:Value-chain oriented programing areas summary

Programming areas	Key programs	Expected targets/ outcomes
Market linkage and export promotion	**High priority** • Develop a market information system (MIS) or decision support model (DSM) for information sharing on key markets for major export products • Support local exporters to strengthen relationships with new and existing buyers through trade fairs, forums and one on one meetings • Maintain an active roster of exporters with key information to facilitate negotiations with buyers on specific products • Support exports through local physical marketplaces and e-commerce platforms in target markets to diversify market and reach more buyers	• **Unique buyer-exporter relations created:** Horticulture: minimum 30, tea: 10, pyrethrum: 2, coffee: 6, essential oils: 3. • **Generated total sales value (USD**): Horticulture: 100,000,000, tea: 50,000,000, pyrethrum: 2,000,000, coffee: 6,000,000, essential oils: 1,000,000 • **Number of product lines:** Horticulture: 5, tea: 2, pyrethrum: 1, coffee: 2, essential oils: 1
Branding	**High priority** • Develop and communicate content behind Rwanda brands, ensuring Rwandan products associate with high quality, taste, sustainable, climate and environmental • Enforce compliance with Rwandan brand standards **Medium priority** • Develop traceability system of exported products Leverage international events in Rwanda and abroad to advertise Rwanda brands	• Increased recognition of Rwanda brands as quality brands
Global operators attraction	**High priority** • Identify investment opportunities for identified land sites, and develop business cases • Attract global and regional operators to establish/or co-invest in Rwanda • Support operators in establishing and beginning operations in Rwanda • Support operators in continuing their operations or expanding their businesses	• **Value chain-specific businesses attracted**: Horticulture: 5, tea:2, pyrethrum: 1, essential oils: 1 • **Total investments committed (USD)**: horticulture: 23 million, tea: 60 million, pyrethrum: 10 million, others: 4 million
Business Incubation	**High priority** • Support expansion of early- and mid-stage exporters in established value chains **Medium priority**	• **Businesses supported:** Horticulture: 45 international-market focused businesses, 17 existing international-market focused businesses, and 20

	• Innovation experimentation in new growth value chains (proof of concept) • Support creation/development of ag technology and innovation with the potential to catalyze ag exports growth	existing regional-market focused businesses, others: 3
Productivity and quality management	<u>**High priority**</u> • Facilitate exporter-farmer cooperative clusters for increased access to agronomic technical knowledge, quality inputs, production and post-harvest management infrastructure, and compliance with quality standards and regulation requirements • Showcase new crops and varieties, new technology, and best agronomic practices through demonstration farms <u>**Medium priority**</u> • Agriculture land mapping and planning, leveraging existing MINAGRI efforts (agriculture land information system – ALIS) • Accelerate R&D efforts in key sectors that contribute to the export base	• **Optimized land area under cultivation:** Horticulture: 7,442 ha for high value crops, tea: from 26,897 to 35,000 ha, coffee: 24% reduction of current area. • **Increased yield (MT/ha):** Horticulture: 20% increase for high value crops, tea: early estates (0.8 to 2.2), adolescent estates (3.25 to 6), Pyrethrum: 0.5 to 0.8, coffee: 0.5 to 0.7. • **Exporters supported:** 37 existing + 45 new for horticulture, 16 existing + 3 new estates for tea, 1 existing for pyrethrum, 4 existing for cereals, 3 existing for essential oils and 1 existing for stevia • **Farmers supported:** Horticulture: 85,000, tea: 45,840, coffee: ~12,000, coffee: 355,771 • Improved feedback from buyers/market
Logistics & infrastructure coordination	<u>**High priority**</u> • Provide infrastructure and logistics support for perishable products for international export markets – Increase airfreight capacity) • Provide infrastructure and logistics support for perishable products for regional export markets – Facilitate investments in infrastructure and processing (e.g., slaughterhouse) <u>**Medium priority**</u> • Provide warehouse for non-perishable exports for both international and regional export markets	• **Number of businesses supported:** 72 (37 existing + 45 new)

Market linkage and export promotion

Programming area objectives and target

Via this programming area, NAEB seeks to support Rwandan exporters to create new buyer relationships, with the aim of supporting market diversification for Rwandan products and potentially securing higher margins. Creating new buyer relationships and strengthening existing

ones is particularly important to ensure increased exports towards diversified target markets. This should be an ongoing initiative as new and existing Rwandan exporters grow from small-scale, early-stage businesses to commercial-scale. To achieve this, NAEB needs to develop inhouse capability and understanding of international market requirements, needs, trends, how to identify buyers, manage them and increase tangible impact.

Figure 21: Market linkage targets

Focus sectors	Horticulture	Tea	Pyrethrum	Coffee	New growth value chains
Intensity of intervention					
Targeted actors and markets	Buyers of fresh horticulture products in the EU, Middle East, and Africa	Buyers of tea in Asia, USA, Europe and North Africa	Buyers of pyrethrum extract in USA, Europe and Africa	Buyers and producers of coffee in USA, Europe and Asia	Buyers of essential oils in the EU, Asia, and Africa
Type & size of beneficiary actors	Exporters at any stage	Exporters at any stage	Exporters at any stage	• Exporters at any stage • Cooperatives	All stages of exporters of essential oils
Target / KPIs					
# of unique[1] buyer - exporter relations created	Minimum 30	10	2	6[2]	3
Total sales value (USD)	100,000,000	50,000,000	2,000,000	6,000,000	1,000,000
# of product lines[3]	5	3	2	3	1 (essential oils)

Intensity of intervention Strong Medium Limited

1: one buyer connected to 3 exporters = 3 unique buyer – exporter relations
2: All Rwanda coffee is currently sold via direct buyers
3: Product lines = different types/categories of products

Key programs

The market linkage program hinges on four categories of activities, detailed below:

1. **Develop a market information system (MIS) or decision support model (DSM) for sharing supply, demand, price trends, and barriers to entry across key markets for major export products.** The MIS or DSM is an analytical tool, incorporating a thorough screening process that facilitates systematic export market selection through the identification of realistic export opportunities for firms wanting to expand their sales reach into foreign markets. It also offers alternatives to exporters where they are facing saturation and/or declining growth in their traditional markets.[8] The tool will be used to share and promote periodically key market opportunities to exporters. For continuous easy access, a simple visual tool with high-level opportunity indicators will be embedded on its website, while a trained NAEB staff will be available to assist exporters in contextualizing and interpreting the market information and/or

[8] IGC – Viviers and Cameron, 2017, Using a Decision Support Model to Identify new export opportunities for Rwanda
The DSM methodology takes into consideration all possible worldwide products, country combinations and, using four filters, progressively eliminates less promising markets until those with the greatest prospects of success are revealed.

DSM outputs. Such service could potentially be provided on a membership basis, for businesses to understand markets with the highest demand for different products, at what price point competitors are supplying those markets, and key regulatory requirements and other barriers to entry to access each market. The regulations and standards across key markets can be used to inform NAEB's quality assurance efforts across all value chains. NAEB, in partnership with the International Growth Centre, has undertaken an initial assessment for such a tool in 2017, and the results must be leveraged towards implementation.

2. **Support local exporters to strengthen relationships with new and existing buyers by increasing participation in trade fairs and forums, inviting buyers to Rwanda for one on one meetings and production site visits and skilling exporters how to maintain and strengthen these relationships sustainably**. Increasing participation in trade fairs and forums includes identifying in advance key and strategic international trade fairs and forums with the greatest potential to attract new buyers, planning for the relevant fairs and forums by seeking buyers information ahead of the fairs and preparing brochures adapted to the audience, and coordinating and supporting exporters in setting up at those events. For one-on-one market linkage relationships building, the program will also involve inviting potential buyers for business site visits in order to witness firsthand Rwandan crops quality and increase their interest in buying Rwandan products from specific exporters. Finally, for sustainability purposes, the intervention will seek to equip exporters with the appropriate level of professionalism and business skills to continue to strengthen these buyers relationships. Strengthening buyer relationships will also require collecting buyer's feedback shared with companies (e.g., product rebate, issues with specifications requirements, etc.) on a continuous basis to identify key areas of training required for exporters in specific value chains, and administering a quarterly feedback survey to buyers for feedback on products imported from Rwanda, across specific product categories.

3. **Maintain an active roster of exporters with quantity and quality of crops they can export on a daily/weekly basis and possessed trade certificates to better inform buyer negotiations on specific products.** NAEB will maintain an active roster of exporters and key export information, keeping an actively updated table which provides key information that the exports market development team can use to support their buyer negotiation efforts.

4. **Support exports through local physical marketplaces and e-commerce platforms in target markets to diversify market and reach more buyers**. NAEB has some ongoing projects in horticulture and tea value chains to support and promote this purpose. These include : (1) an ongoing initiative of establishing a ***Kigali Wholesale Market*** for Fresh Produce to serve as 'an aggregation hub to catalyze supply to both international and regional markets in neighboring countries' [9] among others ; (2) the establishment of ***Rwandan e-tea and -coffee auctions*** to improve grading efforts of Rwandan tea in order to secure higher prices equivalent to the premium tea quality produced, and expand market for high-quality coffee ; as well as (3) using ***Alibaba's e-commerce platform*** for the sale of coffee and other products to China – with the potential to expand into new products. This will help to increase market penetration and market expansion beyond wholesalers (e.g., to coffee shops, tea shops, agents, etc.) across markets. This activity will be a continuation of ongoing NAEB's efforts and may include

[9] Kilimo Trust, 2019, Kigali Wholesale Market

creating similar new initiative in the upcoming years such as joining new e-commerce platforms such as Amazon and e-buy, to name a few.

Implementing actors and approach

Table 5: Market linkage programming area implementing actors and approach

Activities	NAEB's role & Point person/team within NAEB	Supporting/ Implementing partners	Priority
Develop a market information system (MIS) or a decision support model (DSM)	• **NAEB's role:** Oversee implementation and select a partner to develop the tool • **Point person/team within NAEB:** International & regional market development specialist	An ideal lead implementer should have good analytics capabilities, access to key agricultural exports market data and experience in building similar tools	High
Support exporters in strengthening relationships with new and existing buyers	• **NAEB's role:** Oversee implementation by coordinating with implementing partners • **Point person/team within NAEB:** Export market development and innovation division	An ideal lead implementer should be involved in similar initiatives or work with a large network of buyers in the global north, and other relevant markets, coupled with good delivery capacity to help nurture buyers relationships	High
Maintain an active roster of exporters *(to inform exporter-buyer relationships strengthening)*	• **NAEB's role:** Lead implementation • **Point person/team within NAEB:** 1 team member in the export services division with oversight of products that transition to exports	**Exporters** – to avail data on available products and specification, volumes, and timelines	High
Support exports through local physical marketplaces and e-commerce platforms	• **NAEB's role:** Oversee the implementation and outsource a partner to lead execution • **Point person/team within NAEB:** Export market development and innovation division manager; Specialists in respective value chains division	An ideal lead implementer should have experience in coordinating marketplaces and facilitating agricultural products sales and auctions	High

Branding

Programming area objectives and target

This program is focused on increasing visibility of Rwandan brands on regional and international agriculture export markets. Rwanda brands are not yet known on the global market and this, along with other factors, hinders the sales of export crops at higher prices matching their quality.

Kenya has been historically the main source in our supply-chain for horticulture products in Africa, and we progressively expanded into new countries such as Egypt, Tanzania, and Ethiopia. It is only recently that we have come across of Rwanda as a potential long-term partner. – Importer from the EU

As a result, this program aims to promote Rwandan brands on international markets as high quality products by: (1) developing content behind and advertising Rwanda brands; (2) enforcing compliance with the Rwandan brand standards; and (3) leveraging international events in Rwanda and abroad to advertise Rwanda brands.

Figure 22: Branding programming area targets

Focus sectors	Horticulture	Tea	Pyrethrum	Coffee	New growth value chains
Intensity of intervention					
Targeted actors	Buyers of Rwandan products on international markets				
Target / KPIs					
	Increase recognition of Rwanda brands as quality brands				

Intensity of intervention Strong Medium Limited

Key programs

NAEB can increase branding efforts of Rwandan products via three categories of activities, detailed below:

1. **Develop and communicate content behind Rwanda brands,** ensuring Rwandan products associate with high quality, taste, sustainable, climate and environmental**.** Under NAEB's leadership, Rwanda has developed key products brands including Rwanda Tea, Rwanda Coffee, and Rwanda Fresh. These brands are not yet fully established and used by exporters, given the development of its content is still ongoing. The content behind the brands may include:
    - **Product grade** – For example, by deciding product grades that are suitable for exports to international markets and therefore eligible to carry the brands
    - **Minimum required certifications, as applicable** – basic export certifications such as Global Gap can be included in the brand, but this must integrate feasibility for exporters to acquire such certifications, and requirements of the destination market
    - **Phytosanitary compliance** – ensuring that exported products comply with the phytosanitary standards included in the order from the specific buyers or destination markets before exports, such as Maximum Residue Levels (MRL)

- **Sustainability and environment standards compliance**

2. **Develop a traceability system of exported products** which includes tracing exported crops back to their origin, important information for buyers and end consumer who care about product quality or supporting smallholder farming communities. The development and implementation of this system will require i) an initial assessment of traceability system's needs in line with market requirements and current gaps in existing data recording procedures, ii) software development to address issues surfaced by the initial assessment, iii) laptops provision to each collection point in the value chain (to record products characteristics), iv) training of stakeholders along the value chain, and v) verification of traceability processes along the value chain by technical staff.[10] Traceability efforts can also include the profiling of key characteristics of products grown in specific parts of Rwanda. For example, NAEB is already implementing an ongoing appellation program for Rwanda coffee, aimed at establishing unique flavor and taste profiles of coffee in different coffee growing regions of the country,[11] in order to enrich the coffee brand. The cost of traceability systems often falls heavily upon producers while the surplus revenue accrues to traders and exporters. Accompanying traceability with a fair minimum farmgate price policy could incentivize farmers to participate.
3. **Enforce compliance with Rwandan brand standards.** Once the brand content is approved, NAEB will be in charge of close monitoring to ensure exporters are fully compliant with the requirements to use the Rwanda brands. For example, to ensure phytosanitary compliance, NAEB can put in place random sample testing for products from specific exporters
4. **Leverage international events in Rwanda and abroad to advertise Rwanda brands** – identifying events with large coverage to showcase Rwanda brands, E.g., Africa CEO forum, Tour du Rwanda, World cup, etc.

Implementing actors and approach

Table 6: Branding programming area implementing actors and approach

Activities	NAEB's role & Point person/team within NAEB	Supporting/ Implementing partners	Priority
Develop and communicate content behind Rwanda brands	• **NAEB's role:** Lead development of the brand content and **Point person/team within NAEB:** Respective value chains specialists in the traditional and emerging commodities divisions and the quality assurance and regulatory division	Ideal support partners should have expertise in brand development, and strong understanding in certification and regulatory requirements in target markets	High

[10] International Trade Center and Trade Impact for Good, 2015,Traceability in food and agricultural products

[11] NAEB, 2014, Tender Notice: Request for expression of interest to the recruitment of individual consultant to do the appellation program for Rwanda coffee on behalf of PRICE/NAEB

Develop traceability system of exported products	• **NAEB's role:** Co-lead implementation by developing or strengthening of a traceability system for key value chains (horticulture and coffee), supporting the private sector in managing the traceability system for well-established value chains (tea), and training stakeholders • **Point person/team within NAEB:** Respective value chains specialists in the traditional and emerging commodities divisions and the quality assurance and regulatory division	Ideal supporting implementing partners should have expertise in traceability programs, quality assurance, and product profiling	Medium
Enforce compliance with Rwandan brand standards	• **NAEB's role:** Lead implementation • **Point person/team within NAEB:** Quality assurance and regulatory division	N/A	High
Leverage international events in Rwanda and abroad to advertise Rwandan brands	• **NAEB's role:** Oversee implementation and select a marketing company to lead implementation • **Point person/team within NAEB:** PR & communication specialist under the Chief Executive Officer	Marketing companies with extensive experience in international events coverage to design, adapt branding materials, and advertise at key international events	Medium

Global operators attraction

Programming area objectives and target

The global operator attraction programming area aims to attract global businesses to invest and operate in specific Rwandan value chains for production and exports and in other cross-cutting extension services. Via this program, NAEB aims to not only attract global operators to Rwanda, but to also to provide continued support after they have established in Rwanda, to facilitate their operations. The program will prioritize attracting operators in tea, horticulture, and essential oils production (and processing), as these value chains can benefit the most from scaled and commercialized production and increased access to markets given their current international market positioning and potential to grow.[12]

[12] Pyrethrum production and export sales will be facilitated mainly through the market linkage program. Stevia sector already has an international investor operating in Rwanda and committed to increase production and launch a processing facility, given current low volumes produced

This programming area targets global/regional operators in specific value chains production with capabilities to set up and manage commercial-scale production sites in Rwanda, and ideally with established linkages to export markets – e.g., Vertically-integrated supplier of value chains, food/plant-based products manufacturers, global retail chains, etc. These include global operators into fresh export value chains such as horticulture, or involved in processing/value addition for value chains that have potential to gain additional export revenue margins from local processing, refining, or drying of the raw ingredients – e.g., Stevia extracts and essential oils

Figure 23: Global operator attraction targets

Focus sectors	Horticulture	Tea	Pyrethrum	New growth value chains
Intensity of intervention				
Targeted actors	• Global, vertically-integrated value chain suppliers • Global processing companies in value chains with potential for processing • Global air freight operators			
Type & size of beneficiary actors	N/A			
Target / KPI				
Number of value chain-specific businesses attracted	5	3	1	1
Total investments committed (USD)	50 million	100 million	10 million	5 million

Intensity of intervention Strong Medium Limited

Key programs

Programs are designed to support prospective operators before, during, and after investments take place.

1. **Opportunity identification**
    a. Land mapping and earmarking for specific investment opportunities – This is a critical step prior to operator attraction and is further developed in the quality and productivity management programming area
    b. Ongoing identification of investment opportunities for specific land sites and developing business cases (investment IRR analysis, advantages to investing in Rwanda, etc.)
2. **Operator attraction** – Attract global/regional operators to come into Rwanda through:
    a. Outreach to potential global operators and showcasing business opportunities – Leveraging international gatherings such as the Africa CEO forum, or by tendering bids for interested global operators to apply
    b. Participation in negotiations, if necessary and alongside RDB as lead negotiator, terms of the business deal
3. **Establishment facilitation** – Support operators in establishing and beginning operations in Rwanda in areas such as: (i) land development, (ii) supply chain support (e.g., farmers/cooperatives organization, around the farm or factory), (iii) farmer/cooperatives training and inputs access, and (iv) export certification.

4. **Post-establishment support** – Support operators in continuing their operations or expanding their businesses through: (i) government relationship management, (ii) identifying and connecting with potential partners (incl. local supply partners or investors to scale operations or support in easing certain value chain challenges), and (iii) other additional and relevant support required for expansion – e.g., land expansion.

Implementing actors and approach

NAEB and RDB will work closely together in approaching operators, pitching business cases, and facilitating operator establishment in Rwanda. Each institution's role will vary in every case depending on their strengths, weaknesses, strategic positions, and relationships with the potential operator; however, effective communication and streamlining approaches and delivery speed between NAEB and RDB, and other ag institutions (RAB and MINAGRI) will help ensure that operators have the same experience while establishing in Rwanda, regardless of who the first touchpoint institution is.

Table 7: Global operators attraction implementing actors and approach

Activities	NAEB's role & Point person/team within NAEB	Supporting/ Implementing partners	Priority
Opportunity identification	• **NAEB's role:** Lead implementation by identifying land sites for specific uses through the land mapping and planning program, and developing business cases for earmarked lands • **Point person/team with NAEB:** Planning division – GIS specialist, Planning specialists;	• MINAGRI: Support land mapping and planning	High
Operator attraction	• **NAEB's role:** Co-lead implementation with RDB by leveraging business cases to identify and approach global operators, and also engage an external partner to support in marketing business opportunities in Rwanda, with global operators • **Point person/team within NAEB:** Strategic investment analyst	• **RDB:** Co-lead implementation by marketing business cases, attracting global operators and leading deal negotiations • **External partner:** An ideal supporting partner should have a strong established network with global operators in specific value chains production	High
Establishment facilitation and post-establishment support	• **NAEB's role:** Co-lead implementation by supporting operators to set up businesses (farms or factories) work with farmers and cooperatives, training farmers; ensure	• RDB: Co-lead implementation by providing support in business registration and aftercare services (e.g., support to solve any issues that may	High

	agriculture exports sector stakeholder management • **Point person/team within NAEB:** Division managers of respective value chains	arrive post-establishment)	

Business incubation

Programming area objectives and target

Business incubation will support early- and mid-stage exporters in established value chains, innovation experimentation in new growth value chains (proof of concept), as well as support ag technology and innovation with the potential to catalyze ag exports growth. The program will increase private sector engagement in established sectors with few exporters such as horticulture, value-added pyrethrum, by supporting existing and new export-oriented businesses in those value chains. Such support includes grouped logistics services as well as business development support (BDS). The business incubator will also serve for innovation experimentation (e.g., testing production, value addition, and export opportunities in new growth value chains) to serve as proof of concept for private sector investment. Finally, it will serve as BDS provider to ag technology and innovation businesses which can serve to boost the growth of businesses in key value chains.

The NAEB business incubator is unique in a sense that it does not only focus on providing typical business development support (BDS) services offered by conventional incubators but offers most importantly, complementary services and shared infrastructure (e.g., packhouse, cold chain transport, etc.), along with support in obtaining certifications, reaching buyers, etc. These services help businesses grow technically and to establish themselves in key markets. It does not, therefore, replace other nationwide incubation initiatives such as incubators to be set up within the Kigali innovation city.

Figure 24: Business incubation targets

Focus sectors	Established value chains		New growth value chains	Ag tech and innovation businesses
	Horticulture	Value-added pyrethrum		
Intensity of intervention				
Type & size of beneficiary actors	Seed/early/mid stage businesses			
Target / KPIs				
Number of businesses supported	• 45 new focused on international markets • 17 existing focused on international markets • 20 existing focused on regional markets	1 existing	3 existing 3 new	2

Intensity of intervention Strong Medium Limited

Key programs

1. **Support early or medium-stage export-oriented businesses in established value chains by leveraging specific services from other programming areas** (e.g., market linkage, exports logistics, and infrastructure coordination, Productivity and quality management, etc.) and tailoring these to specific value chain needs and growth stages.
    a. **Support in exports business establishment and business management practices, including:** (i) business registration support, (ii) providing shared office space, (iii) identifying suitable land for production (land allocation to grow successfully), (iv) financial planning, and (v) business management skills
    b. **Support in agronomic technical capacity building:** (i) Increase access to quality products along the supply chain via linkage to producer groups, (ii) Transfer best agronomic practices and support in securing certifications, and (iii) monitor quality management at production, post-harvest, processing, and handling of export products
    c. **Support in access to shared facilities** (e.g., packhouse, warehousing, etc.). In line with the New Bugesera airport construction, this will involve construction a new shared packhouse for early-stage exporters, closer to the new airport
    d. **Grouped logistics and equipment support to enable efficient connection to markets, especially for perishable products.** Most early-stage exporters aggregate small volumes from smallholder out-growers,[13] and grouped logistics can maximize the existing logistics capacity and streamline the process from aggregation to shipping to export destinations. NAEB has been providing some of these services to horticulture exporters in the past 2-3 years, attributing the fast growth of the horticulture sector. Extension of the grouped logistics services to exporters of other new growth value chains can spur even higher growth. These grouped logistic services can be provided

[13] NAEB, 2017 Annual Report 2017-2018; In 2017 only 17 exporters exported more than 500 MT per shipment, the minimum volume required for using the airport logistics

by a private operator connected to early-stage businesses via the incubator. Specific services include:

i. **Grouped product collection and transport:** Grouped pick-up of products from farms to the packhouse, and from packhouse to airport, to maximize (cold chain) transport logistics capacity usage.
ii. **Grouped airport/seaport/border clearance:** A single service provider manages grouped clearance. Exporters can save on fragmented handling expenses paid to various clearing agents and gain in the margin.
iii. **Coordination with air freight companies for fixed daily cargo space for perishable crops:** A single service provider organizes scheduling for shipping with all airfreight providers (e.g., RwandAir, KLM, Brussels, etc.), and can offer a fixed daily space average cargo price for all exporters. With fixed daily cargo space paid by the service provider, airfreight providers can block cargo space for exporters, and exporters can avoid off-loadings or losses or delays in delivery. Shipment volumes and schedules managed by a single entity can also improve efficiency in off-loading trucks, airport handling, and loading planes.

e. **Support in increasing and strengthening market linkages** by supporting small exports to develop and strengthen relationships with new and existing buyers

f. **Other business management practice support** such as financial planning and day to day business management skills

2. **Innovation experimentation in new growth value chains** – As NAEB identifies potential new growth value chains, the incubator will serve to support the development of seed businesses with the purpose of testing new business opportunities within growth value chains worth experimenting (including in production and value addition) for exports. The main purpose for this program is the to develop the proof of concept for new exports products, with successful cased evolving/maturing to move into the first program (incubation of export businesses in established value chains). To do so, the program will:
    a. Leverage strategic analytics to identify potential market opportunities / new products and raise entrepreneurs interest into these sectors. In some cases, NAEB may co-invest in some market opportunities where there are hesitations from the private sector to come in (e.g., as done previously in the flower sector).
    b. Closely support businesses to develop their product (s), and test them out as proof of concept
    c. Support successful cases to mature into the first program (incubation of export businesses in established value chains), where they will receive the same services to expand to early/mid-stage businesses

3. **Incubation of ag technology and innovation businesses –** Innovations related to agriculture technology, equipment, Fintech, ICT, etc., are emerging trends that can be looked at as part of innovation in the ag sector. Creation of such innovations can play a catalytic role in expanding agriculture production, processing, quality management, and marketing, at a faster pace. Conscious of this, the incubation programming area will involve support to new technology-driven innovative ideas in testing and rolling out their innovations in collaboration with businesses in the sector. These innovations if proven will overtime benefit ag export-focused businesses within the incubator and beyond.

Implementing actors and approach

Table 8: Business incubation implementing actors and approach

Program	NAEB's role & Point person/team within NAEB	Supporting/ Implementing partners	Priority
Established value chains business incubation	• **NAEB's role:** Co-lead implementation with a partner involved in similar incubation work • **Point person/team within NAEB:** Divisions already leading other NAEB strategic programming areas linked with business incubation (e.g., market linkage. Productivity and quality management, etc.)	• An ideal lead partner should be involved in similar incubation work with a successful record in markets similar to Rwanda – to co-lead implementation with NAEB • Organizations/implementing partners already leading or supporting other NAEB strategic programming areas linked with business incubation (e.g., market linkage, quality production, and productivity management, etc.)	High
Innovation experimentation in new growth value chains	• **NAEB's role:** Oversee implementation while selecting a partner to lead execution • **Point person/team within NAEB:** Chief operation officer in charge of Value chain development & regulation		Medium
Ag tech and innovation businesses incubation	• **NAEB's role:** Promote programs by attracting other partners to implement (e.g., Kigali Innovation City via RDB) • **Point person/team within NAEB:** Export market development and innovation division	• Kigali Innovation City to lead implementation – as part of its mandate, the Kigali innovation city will involve an innovation lab and incubator with a focus on key innovation areas, including ag tech • **External partner:** An ideal lead partner should be involved in similar incubation work with a successful record in markets similar to Rwanda – to co-lead implementation with NAEB	Medium

Productivity and quality management

Programming area objectives and target

These programs aim to improve both the quantity and quality of production of agriculture export products by (i) increasing yield, (ii) expanding the land area under cultivation, and/or (iii) enhancing post-harvest handling practices that affect the quality of produce after harvesting. Both yields and

production areas for high potential crops are currently not optimized given the limited resources and agronomic expertise of farmers, especially in nascent sectors such as horticulture and stevia, and in highly fragmented sectors such as coffee. Post-harvest quality management is particularly critical for perishable products such as horticulture, animal products, etc. to keep in line with quality and safety standards required by importing countries (particularly EU countries), but also to attract higher prices and become renown as trustworthy business partners.

Figure 25: Productivity and quality management targets

Focus sectors	Horticulture	Tea	Pyrethrum	New growth value chains	Coffee	Cereals	Animal products
Intensity of intervention							
Type & size of beneficiary actors	• Early/Mid-stage exporters • Farmers/ cooperatives	• Existing/ new estates • Farmers/coo peratives	• Exporters • Farmers/ cooperatives	• Exporters • Farmers/ cooperatives	• Farmers/ cooperatives	• Exporters	• Exporters • Farmers/ cooperatives
Target / KPIs							
Land area under cultivation (ha)	Increase land for high value crops by 12,164 ha	From current 26,897 to 35,000	Unchanged	N/A given nascency	Reduce by 5%[1]	N/A	N/A
Yield (MT/ha)	Increase yield by 20% for all high value crops	Early estates: 0.8 to 2.2 Adolescent estates: 3.25 to 6	From current 0.5 to 0.8	N/A given nascency	From current 0.5 to 0.7	N/A	N/A
Number of exporters supported	37 existing[2] +45 new	16 existing +3 new estates	1 existing	4 (existing or new)	N/A	4 existing	N/A
Number of farmers supported[3]	85,000	45,840	~12,000	N/A given nascency	355,771	N/A	N/A
Market feedback	Improved feedback from buyers/market based on qualitative assessment; In relation to market linkage activities						

Intensity of intervention Strong Medium Limited

Notes
1: 24% of coffee plants are aged and close to the end of productive years; Land areas with these aged plants will be gradually re-allocated to produce other high potential crops, while new areas on the Kivu belt will be added for coffee, consummating in 5% decrease in overall land for coffee production
2: 17 existing exporters targeting international markets (outside East Africa) and 20 existing exporters targeting the regional market
3: Farmers supported directly and indirectly via exporters
Source: NAEB's export data, 2012-2018; Sectoral Dalberg analysis, 2019

Key programs

The programs under Productivity and quality management are organized around capacity building of farmers and exporters to support production of commodities in higher quantity and quality in response to increased market demand resulting from market linkage and branding efforts. To achieve these goals will require a combination of different programs including: (1) Agriculture land mapping and planning, leveraging existing MINAGRI efforts, to ensure effective land allocation for crops based on their potential to grow in certain areas and their value contribution to the export base; (2) Exporter-farmer clusters facilitation for increased access to agronomic technical knowledge, quality inputs, and production and post-harvest management infrastructure; (3) Demonstration farms to showcase best agronomic practices and test new value chains or varieties; and (4) increasing R&D efforts in key crops. Each of these factors heavily affect production quality and quantity.

1. **Agriculture land mapping and planning, leveraging existing MINAGRI efforts, to ensure effective land allocation for crops based on their potential to grow in certain areas and their value contribution to the export base.**

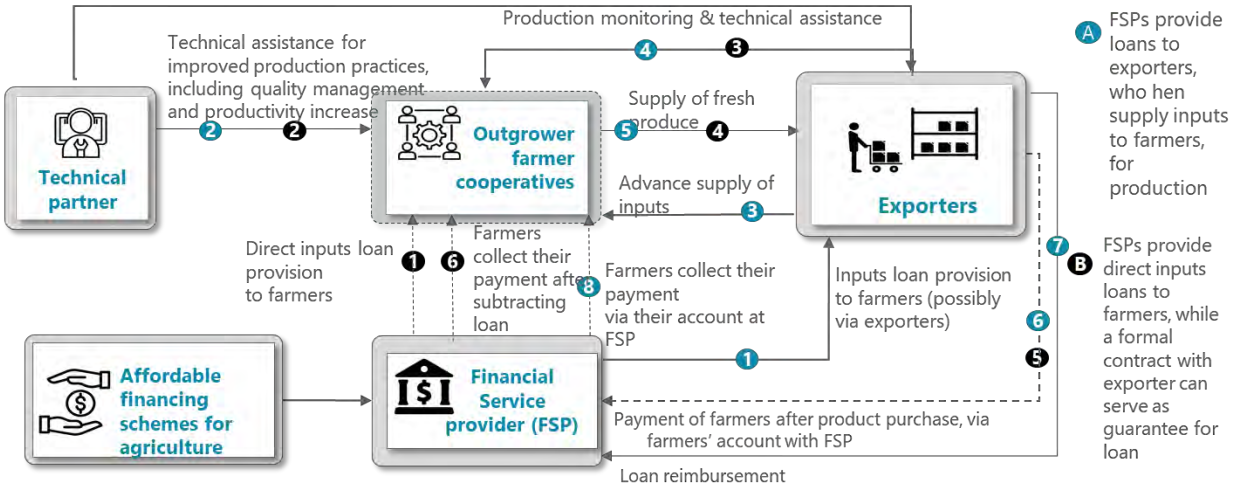
a. **Map lands available for farming across the country:** Effective land mapping is a critical step to ensure optimum allocation to key large-scale agriculture projects that NAEB will undertake, and also informs allocation of NAEB's scarce resources to crops/areas that need them the most. To do so, NAEB should:
    i. Develop a categorization of crops most appropriate to grow in specific regions of the country based on their climate, geographic, and soil conditions, leveraging NAEB, Ministry of Agriculture, and support organizations in the agriculture sector's existing studies. This will lead to the development of agro-ecological zonal clusters adapted to specific crops.
    ii. Identify current use of agriculture lands and their conditions, leveraging recent agriculture census and similar work conducted recently in Rwanda, including the agriculture land information system (ALIS [14]), combined with GIS and satellite imaging

b. **Land planning and allocation:** Based on land mapping, NAEB will earmark key lands for commercial production of specific crops to inform Global operator attraction efforts, and where required, will undertake land re-allocation to ensure optimum land use for productivity. For example, in the coffee sector where production is scattered across the country, there are production areas in the Kivu belt where scattered farmers can be brought together on consolidated production of up to 100ha, by filling gaps in between different producers and allocating current unused land to other farmers. Where applicable, land planning may also result in encouraging farmers to switch to or diversify into crops most appropriate for their lands or higher value crops.

2. **Exporter-farmer cooperative clusters facilitation for increased access to agronomic technical knowledge, quality inputs, and production and post-harvest management infrastructure**. Rwandan agriculture is dominated by smallholder farmers who can be difficult to reach directly to improve production techniques at scale. However, in export-oriented production, these smallholder farmers can be more easily reached via exporters who are often involved in direct sourcing from farmers, technical capacity building in agronomic practices, and in some cases, inputs financing – this is the case for tea and horticulture. In established sectors such as tea, these clusters already exist at different stages of maturity, enabling farmers to access inputs and technical capacity building via the processor/exporter, but new emerging sectors do not yet have such structures in place. Facilitating exporter-farmer cooperative clusters help bridge this gap while in turn increasing supply of quality produces to exporters. Achieving objectives of this activity requires some semi-flexible structure illustrated below, enabling to provide three types of services to farmers via the exporter and with support of technical partners:

[14] Land information database providing information such as plot size, agro-ecological conditions, and proximity to water sources, feeder or main roads, and through which prospective investors can locate land that meets the selection criteria for their investment ideas.

Figure 26: Example exporter-farmer cluster illustration



Source: Dalberg analysis, 2019

a. **Agronomic technical capacity building** –Exporters equipped with appropriate knowledge in farming and post-harvest handling can provide technical capacity building to farmer cooperatives in their supply chains. Farming technical knowledge and skills to increase productivity and quality, include (i) crop rotation, (ii) integrated pest management (IPM), and (iii) specific agronomic practices that will lead to quality improvement – e.g., increase pyrethrin content in pyrethrum, steviol glycoside content in stevia, etc. Knowledge and skills in post-harvest handling include (i) temperature and humidity control, and (ii) product hygiene and sanitation maintenance, throughout the stages of cleaning, sorting, grading, and transporting to the packhouse. NAEB currently provides training to farmers on seedling multiplication and good agricultural practices in key export value chains, which it will expand on. In relevant cases, NAEB and its technical partners will accompany early/mid-stage exporters in quality and safety standards compliance to access specific certifications or comply with market regulations.

b. **Improve access to quality inputs –** Exporters supply inputs to their out-grower farmers, either directly or by providing formal contracts as guarantees for direct inputs loans to farmers. NAEB will also develop co-funding mechanisms with exporters to ease inputs financing for farmers, as further detailed in the financing cross-cutting intervention

c. **Support access to production infrastructure**
    i. **Improve access to reliable and adequate irrigation** infrastructure depending on types of crop and farm locations. The Ministry of Agriculture has installed large irrigation systems on some productions sites across the county and these can be further expanded, by bringing in new partners to fund their successful replication. Irrigation is also the largest investment component of the PSTA IV (25% of the total PSTA IV budget), via the Rwanda Agriculture Board (RAB) as main implementation institution. NAEB will leverage these investments by advising on locations that can benefit the most from these infrastructures, especially for irrigation-dependent crops such as horticulture.

ii. **Improve access to post-harvest equipment and/or facility** by (i) acquiring and leasing equipment to farmers for post-harvest handling (e.g., graders, sizers, dryers, box-fillers, etc.), and (ii) installing storage and handling structures (e.g., cleaning and sorting rooms) on aggregated farmlands for farmers to directly access, etc.

3. **Demonstration farms to test and showcase new crops and varieties, new technology, and best agronomic practices.** These farms will be used as testbeds for cultivating new growth crops identified by NAEB in Rwanda and/or new crop varieties that are developed as a result of the R&D efforts detailed below. Set up near aggregated farmlands, demonstration farms will also serve as centers of excellence for farmers and exporters, demonstrating various agricultural techniques for new emerging crops (e.g., horticulture, stevia, and essential oils) that are yet to be widely adopted.

4. **R&D on key crops –** NAEB will partner with the Rwandan Agriculture Board, NIRDA and the private sector to accelerate R&D efforts in key sectors that contribute to the export base such as tea, and in new emerging crops, on a need basis. This will require associating the private sector in research efforts in order to tailor research efforts to actual private sector and consumer needs and includes:
    a. **Strengthening Rwanda's internal research capabilities** on crop varieties, pests and diseases, and pest risk mitigation practices, for some of the important crops such as tea.
    b. **Developing seedlings and new pest-resistant varieties** suitable for Rwanda's agronomic condition, on a need basis.
    c. **New product and technology development** by identifying and testing new crops and exploring opportunities in processing. The outcomes of this R&D focus will feed into programs under global operators attraction and business incubation.
5. **Inputs distribution for key value chains traditionally supported by NAEB (seeds, fertilizer, pesticide)**

Implementing actors and approach

Table 9: Productivity and quality management implementing actors and approach

Program	NAEB's role & Point person/team within NAEB	Supporting/ Implementing partners	Priority
Land mapping and planning	• **NAEB's role:** Co-lead implementation by developing production maps for key crops • **Point person/team within NAEB:** Planning division – GIS specialist, Planning specialists	• MINAGRI to co-lead implementation via the Agriculture land information system (ALIS)	Medium
Exporter-farmer clusters	• **NAEB's role:** Co-lead execution by coordinating exporters and farmer cooperatives, and associating technical assistance partners, as necessary • **Point person/team within NAEB:** Specific value chain	• Exporters aggregating from out-growers • Technical assistance providers – ideal partners should be institutions with expertise in agronomy, post-harvest handling,	High

	specialists, Quality assurance and regulation division manager	and quality management in the specific value chains • Financial institutions providing agricultural loans	
Demonstration farms	• **NAEB's role:** Lead implementation by operating demonstration farms in partnership with other research institutions or organizations with technical production knowledge in line with destination market requirements • **Point person/team within NAEB:** Product development and innovation specialist, specific value chain specialists, laboratory technicians, in collaboration with specific value chain specialists	• RAB: Provide new crop varieties and products • Institutions with agricultural research capabilities (e.g., NGOs, universities), or with technical production knowledge in line with destination market requirements	High
R&D	• **NAEB's role:** Promote implementation by providing areas of research needs and supporting dissemination of research findings • **Point person/team within NAEB:** Product development and innovation specialist and laboratory technicians, in collaboration with specific value chain specialists	• RAB: Lead implementation with NAEB's advisory • NIRDA • Institutions with agricultural research capabilities (e.g., NGOs, universities)	Medium

Logistics & infrastructure coordination

Programming area objectives and target

This programming area aims to improve the efficiency of supply chain logistics of export products from production site to export destinations via grouped warehousing and transportation activities. Logistics coordination and storage support is necessary for all agricultural value chains but particularly for perishable crops and needs to be tailored to each crop's specific handling needs.

Figure 27: Logistics coordination targets

Focus sectors	Perishable products for international exports	Non-perishable crops
Intensity of intervention		
Targeted actors	• Global logistics operators	• N/A
Type & size of beneficiary actors	• Exporters	• Exporters • Coffee washing stations • Tea factories
Target / KPI		
# of businesses supported	82 (37 existing + 45 new) horticulture exporters	69 existing coffee exporters + 4 existing cereals processors + 16 existing tea factories

Intensity of intervention Strong Medium Limited

Key programs

The logistics and infrastructure coordination programming area centers around the following two categories of programs, based on product's perishability:

1. **Infrastructure and logistics support for perishable products**
    a. **Strengthen handling capacity at airport**, for improved management of perishable products: This aims to ensure that high value perishable products such as fresh horticulture products are handled and maintain according to best practice standards at the airport, and that they arrive at exports destinations in good quality
    b. **Increase air freight capacity, for international exports:** NAEB will promote and support initiatives that expand air freight capacity available for perishable products within the current capacity limit, to reach the export volume targets. RDB and RwandAir will play a critical role in attracting global air cargo operators to run flights from Kigali and negotiating prices and securing cargo space for high-value perishable crops exported to global destinations. The following are both short-term and long-term solutions to unlock additional air freight capacity:
        i. **Maximizing the utilization of currently available yet untapped cargo space in passenger flights by commercial airlines already operating in Rwanda.** Doing so will require revising prices at which Rwandan exporters are willing to ship their products while remaining competitive in their product offerings, in comparison to other countries in the region. For example, RwandAir's current discounted airfreight rate of 0.95 – 1.10 USD/kg are below rates applied in other airports in the region and other carriers operating in Rwanda, which is an average of 1.60 USD/kg. Enticing commercial airlines to keep cargo space for Rwandan exporters requires exporters willingness to pay competitive airfreight rates.
        ii. **Attracting air cargo to stop in Kigali or start a new route from Kigali, to the EU, the Middle East, or other African regions.** This will require bringing in some patient capital or a form of financial guarantee to increase operator's

confidence to establish in Rwanda while exporters reach consistently large volumes for exports

iii. **Expanding RwandAir's capacity through additional fleets and routes to other regions.** RwandAir plans to launch new routes to major cities in Africa and Asia in 2019 and double its fleets by 2024.[15] While RwandAir's management is committed to supporting the growth of agriculture exports via air freight, it is constrained by limited funds and the lead time of up to two years from ordering a plane to being operational. The expansion will, therefore, require financial support and advanced strategic planning taking the export volume growth projections into considerations.

c. **Facilitate specific value chain investments in processing and logistics infrastructure, for regional exports:** Sectors such as animal products require specific value chain investments such as a slaughterhouse for meat (e.g., ongoing Gako Beef Integrated Project[16] – with potential to expand to goat and sheep).

2. **Warehousing for non-perishable export crops, for both international and regional exports:** NAEB already offers a warehouse for storage of ready to export products matching export requirements, such as fully washed coffee. Moreover, there is an existing agreement between the Ministry of Trade and Industry and Dubai Port World to develop and operate the Kigali Logistics Platform (KLP) that is going to provide several services to exporters, including storage facilities.[17] This intervention will continue to provide such services to exporters and expand to other relevant value chains, on a need basis, while leveraging private sector support.

Implementing actors and approach

Table 10: Logistics & infrastructure coordination implementing actors and approach

Program	NAEB's role & Point person/team within NAEB	Supporting/ Implementing partners	Priority
Infrastructure and logistics support for perishable products for international export markets – Increase air freight capacity	• **NAEB's role**: Promote air freight capacity expansion by supporting RwandAir and RDB in attracting global air freight operators and identifying sources of finance • **Point person/team within NAEB:** CEO office, strategic investment analyst	• RDB • RwandAir and other airlines operating from Rwanda	High
Infrastructure and logistics for perishable products for regional export markets –	• **NAEB's role**: Lead implementation • **Point person/team within NAEB:** Export services division – Cold chain specialist; Quality assurance and regulatory	• Global logistics operators	High

[15] Stakeholder interview, 2019
[16] Flagship project co-led by MINAGRI and the Ministry of defense to increase quality meat production for local and export markets
[17] Ministry of Trade and Industry, 2016, Kigali Logistic Platform to boost international trade and competition in external market

Facilitate specific value chain investments	division manager; Relevant value chains division managers		
Warehousing for non-perishable crops	• **NAEB's role**: Lead implementation by operating the existing warehouse, managing inventories, and overseeing the quality of products • **Point person/team within NAEB:** Export services division – Warehouse officer; Quality assurance and regulatory division manager; Relevant value chains division managers	Organizations with worldwide experience in storage and customs clearance services	Medium

Cross-cutting programming areas detail

Figure 28: Cross-cutting programming areas summary

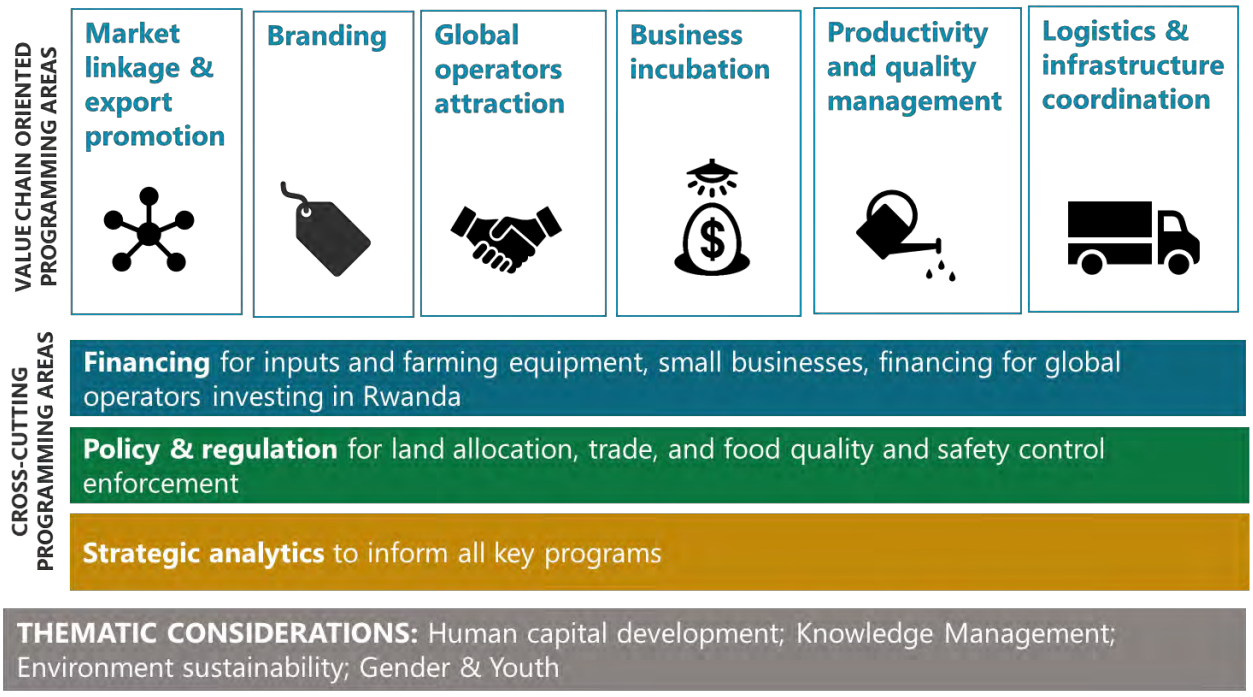


Table 11: Cross-cutting programming areas summary

Supporting interventions	Objectives	Key programs

Financing	Ensure availability of appropriate finance for agricultural exports across different sectors.	**High priority** • Facilitate understanding of agricultural export businesses by banks and investors and strengthen linkage with agricultural export businesses • Facilitate input financing schemes for smallholder farmers in specific value chains in collaboration with the private sector.
Policy and regulatory support	Feed technical inputs into appropriate institutions to influence favorable policy formulation in support of agricultural exports	**High priority** Infuse data, knowledge, and learnings to influence key policies related to • Productive land access • Regional trade • Quality and safety regulation
Strategic analytics	Provide data-driven insights that will guide NAEB's decision-making.	**High priority** • Data-driven research to support decision-making in other programming areas • Problem-solving and continuous strategy improvement: Systemically identify sector challenges and trends that require attention and fast decision-making and develop solutions to enable or facilitate growth.

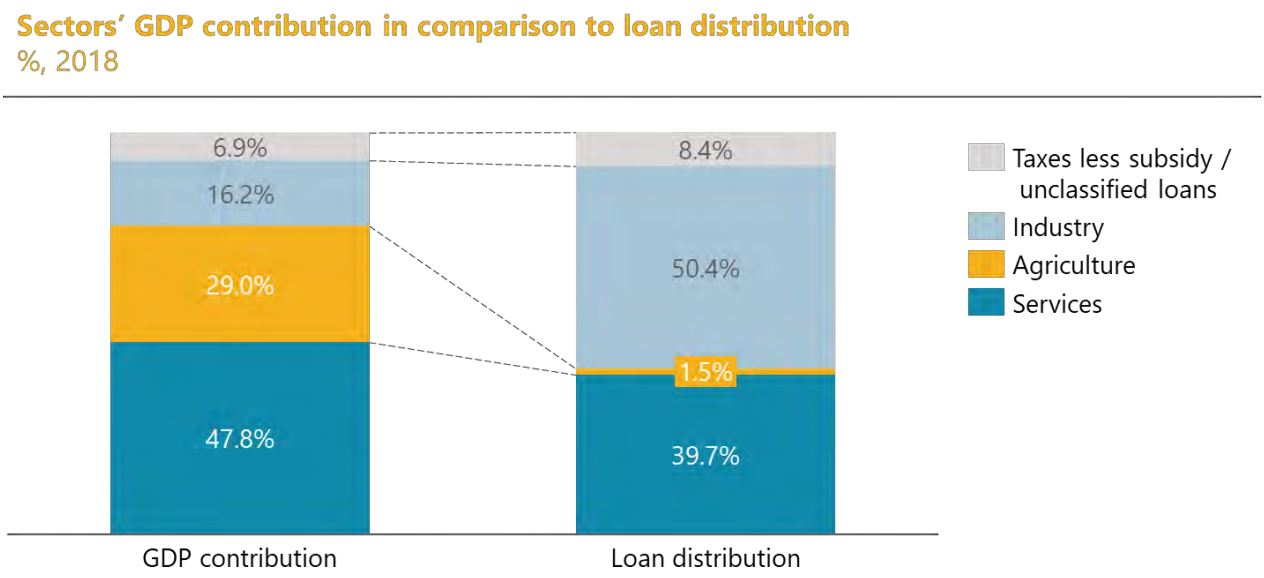
Financing

Program objectives

The aim of the financing intervention is to ensure access to adapted financing options for agricultural export businesses. The percentage of loans to the agricultural sector is currently only 1.5%[18] despite the significance the agriculture sector has in Rwanda's economy; agriculture accounted for 33% of the nation's GDP and employed 66% of the total workforce in 2017-2018.[19] Despite the amount of financing available, agricultural businesses struggle to find appropriate financing mechanisms adapted to the cyclical nature of cashflows in agriculture. Ensuring the availability and accessibility of appropriate financing options for all aspects of agri-exports can help support exports growth. Some financing schemes are currently available in Rwanda for different segments in the agriculture sector. For example, the Business Development Fund supports youth-owned agribusinesses to access bank loans, especially those who lack sufficient collateral when seeking credit,[20] while the HortInvest[21] project's Investment and Innovation Fund (IIF) co-invests with horticulture cooperatives and businesses into the expansion of their operations, with the involvement of small and medium sized farmers.[22] NAEB needs to promote these types of financing solutions, leveraging currents learnings, to benefit a broader set of exporters.

[18] BNR, 2018, Annual Financial Stability Report July 2017-June 2018
[19] Ibid
[20] Republic of Rwanda, 2016, BDF, a new established company to boost SMEs development
[21] HortInvest is a four-year project (Jan 2018-Dec2021) funded by the Embassy of the Netherlands in Rwanda, put in place to improve market-led horticultural production and supplies for domestic and international markets, enhance food and nutrition security of rural households involved in horticulture and urban consumers, develop high-value horticultural crops, and create an enabling environment for commercial horticultural developments.
[22] SNV, 2018, HortInvest project Investment and Innovation Fund open for applications

Figure 29: Loan distribution per sector in comparison to GDP contribution



[1] Services includes service sector, hotel, transport & warehousing, OFI & insurance, and trade
[2] Industry includes mining, manufacturing, water & energy, and mortgage industries
Source: BNR, Annual Financial Stability Report July 2017-June 2018, 2018; NISR, 2018, Gross Domestic Product Q1-Q4 2018

Key programs

- **Facilitate understanding of agricultural export businesses by banks and investors and strengthen linkage with agricultural export businesses.** This entails:
    - **Understanding the needs of agricultural exporters and communicate them to banks and investors**: By enhancing the understanding of agricultural export businesses, NAEB can improve banks and investors' interest in funding ag exporters.
    - **Consolidating and disseminate information on agri-financing opportunities for agriculture exporters**. This can be part of a periodical bulletin shared with exporters or an integrated page into NAEB's website which agri-exporters can easily navigate to learn about available financing options and their eligibility criteria.
    - **Facilitating dialogs between businesses and financing institutions.** This involves connecting interested businesses to financial institutions and coordinating inter-sectoral meetings as necessary.
- **Facilitate input financing schemes for specific value chains in collaboration with the private sector**: In sectors such as tea, farmers typically access inputs advance from exporters, costs of which are deducted at harvest from farmgate prices when farmers supply the harvested products to exporters. However, farmers who grow perennial crops need longer payback periods in their first years of production to be able to invest consistently in production. Input financing schemes, therefore, require some level of flexibility, and NAEB can step in by supporting the setup of inputs revolving funds (e.g., as currently done in tea), or by attracting philanthropic investors or donors with patient capital to serve as a guarantee or to complement private sector efforts.

Implementing actors and approach

Table 12: Financing programming area actors and approach

Activities	NAEB's roles & Point person/team within NAEB	Supporting/ Implementing partners	Priority
Facilitate understanding of agricultural export businesses by banks and investors and strengthen linkage with agricultural export businesses	• **NAEB's role:** Lead implementation • **Point person/team within NAEB:** Chief finance officer's office and various commodities divisions	Analytics team	High
Facilitate input financing schemes for specific value chains in collaboration with the private sector	• **NAEB's role:** Support in design and co-lead execution • **Point person/team within NAEB:** Chief finance officer's office	• Exporters involved in co-financing farmers within their respective supply chains for inputs access, as co-lead • Financial institutions • Development partners, including those with ability to provide patient capital	High

Policy and regulatory support

Program objectives

Policy and regulatory support are necessary to create an enabling environment for businesses in Rwanda's agriculture exports to thrive. NAEB will feed technical inputs into appropriate institutions to influence favorable policy formulation in support of agricultural exports. To do so, we will infuse data, knowledge, and learnings to influence institutions in charge of key policies related to (i) productive land access, (ii) regional trade, and (iii) export product quality regulation.

Key programs

- **Land access –** As a landlocked and densely populated country, Rwanda has limited agricultural land, which increasingly competes with human habitation and other usages, as population growth and urbanization continue. Such competition has led to the heavy involvement of government in land allocation and affects the ability of local and international operators to access appropriate productive land for their operations. To increase accessibility and availability of agricultural land for production for exports, NAEB will leverage findings from the land mapping and planning program to infuse into key policy decisions regarding agriculture land allocation for priority export value chains.
- **Trade policy –** This is an advocacy initiative for NAEB and includes efforts to facilitate the ease of regional trade by reducing both tariff and non-tariff barriers to trade (NTBs).
    - The current EAC Common External Tariffs (CET) is 50% for maize and 35% for wheat. Negotiating their removal from the Sensitive Items list or facilitating cereals

processors to import quality raw materials at international prices would improve competitiveness of value-added cereals from Rwanda.

- Most exports from Rwanda get exported through the Mombasa and/or Dar es Salaam ports due to the landlocked nature of the country. Exporters incur high transportation costs and sometimes face delays due to multiple weigh points and non-tariff barriers to trade.[23] Trade policy arrangements that allow for a reduced time and cost associated with border compliance (customs clearance and inspection procedures will smoothen and expedite the export process).

- **Quality and safety regulation –** Different export markets require compliance with their quality and safety regulations. NAEB often ensures compliance of export products by controlling to-be-exported product quality with specifications provided by the buyer. Going forward and to ensure systemic compliance, NAEB will keep ahead of market information, learning new regulations on specific markets, and leveraging these to inform the Rwandan regulatory body on the needs for the establishment of specific regulations that conform with the international regulations and advise on stricter enforcement.

Implementing actors and approach

Table 13: Policy and regulatory support programming area actors and approach

NAEB's roles & Point person within NAEB	Supporting/ Implementing partners	Priority
• **Role:** Promote policy reforms across land access, trade, and quality and safety regulations, and supporting businesses as necessary • **Responsible team within NAEB:** Chief Executive Officer's office, Planning Division - Planning Specialist, GIS Specialist, and Quality Assurance and Regulatory division	• Ministry of Agriculture and Animal Resources (MINAGRI) • Ministry of environment • Ministry of Local Government (MINALOC) • Ministry of Trade and Industry • Rwanda Standards Board (RSB) • Rwanda Food and Drugs Authority (FDA) • Rwanda Institute for Conservation Agriculture (RICA) • Rwanda law reform commission	High

Strategic analytics

Program objectives

Strategic analytics will allow NAEB to make timely and targeted responses to the changing sector realities and markets by providing data-driven insights that will guide NAEB's decision-making and by developing strategies to address emerging and ongoing challenges within and across value chains. Strategies founded on strong analytics will enable the flagship programs to be run successfully: As many of these programs are market-facing, either involving direct interaction with the market or indirect relationship through supporting exporters who face the buyers, it is critical to feed the analytical information on the constantly changing market outlook, regulations and requirements, and opportunities and challenges that Rwanda's ag export sector faces, into each of these programs. For

[23] Export.gov, Rwanda – Trade Barriers

example, analytics can support with the Global operator attraction programming area by informing NAEB on which new growth value chains have high potentials for growth and specific segments within the value chains that need the most investment. This information will then help NAEB build a business case around those opportunities and use it to attract global operators. Likewise, analytical information on Rwanda's current logistics capabilities and future value chain volume projections can inform decision-making for the exports logistics and infrastructure coordination programming area.

Key programs

NAEB will improve its decision-making capabilities and efficiency by engaging a dedicated strategic analytics team, to support the following:

- **Data-driven research to support decision-making in other programming areas:** The analytics team will sit at the back office, analyzing data and providing strategic advice to the CEO's office regarding key programs and resource allocation across value chains. Strategic analytics will feed into many programs but particularly into programs under market linkage, Global operator attraction, business incubation, and exports logistics and infrastructure coordination.
- **Problem-solving and continuous strategy improvement:** The analytics team will also systemically identify sector challenges and trends that require attention and fast decision-making (e.g., an oversupply of milk in Rwanda, limited air freight capacity, changing political-economic climate in East Africa, etc.) and develop solutions to enable or facilitate growth. In addition to a one-time problem-solving, the team will also continuously respond to internal NAEB needs including exploring new products and markets, implementing actors and approaches.

Implementing actors and approach

Table 14: Strategic analytics programming area implementing actors and approach

NAEB's role & Point person/team within NAEB	Supporting/ implementing partners	Priority
• **Role:** Fundraise for and select an analytics partner, and Oversee implementation • **Point person/team within NAEB:** Chief Executive Officer and relevant division managers	• An ideal partner should have strong data analytics capabilities, while bringing in a strategy lens, to focus efforts on the areas that need attention the most • The partner will work closely with and support the NAEB team and implementing partner for the MIS or DSM development and management	High

II.2 THEMATIC CONSIDERATIONS

Across key programs, NAEB will incorporate the cross-cutting considerations below as an integral dimension of the design, implementation, monitoring, and evaluation of the programs under its strategic plan 2019-2024.

Knowledge management

NAEB and other government institutions regularly collect detailed data points on Rwanda's agricultural production and exports and publish them in periodic reports. By improving the quality and reliability of those data and making those data easily accessible and into effectively visualized forms, NAEB can better inform the key decisions made by various actors involved in Rwanda's agriculture exports. By infusing the knowledge perspectives in all its activities and strategic objectives, NAEB can also ensure the transformation of information into actionable intelligence for evidence-based decision making within the organization. NAEB can achieve these objectives by:

- Increasing staff capacity to effectively collect, manipulate and disseminate accurate information and insights, both internally and externally
- Making NAEB data publicly available, easily downloadable, and ready-to-use, on its online platform (website) to promote learning and data usage by all actors in the agriculture exports sector
- Streamlining control mechanisms for data collection and publication

Human capital development

NAEB's organizational structure has been reviewed and modified to align with its new mandate and business strategy. NAEB, as a leading implementer of many of the programs in this strategy, must be able to flexibly, responsively, and professionally respond to the initiatives/program needs and the fast-changing trends in the agriculture export sector. To do so, NAEB will accelerate efforts in human capacity building by:

- Recruiting and maintaining retention of high-quality staff by providing competitive incentives
- Carrying out periodic training on data management and analytics to improve analytical capabilities of NAEB staff to allow NAEB to make flexible, timely, and targeted responses to its changing program or value chain needs and market trends.

Gender and youth

The government of Rwanda has made a strong commitment to gender equality and to mainstream gender issues in government policies at all levels. PSTA IV provides that all interventions target, include, and empower women both socially and economically. PSTA IV also considers youth to play a critical role in driving growth in agriculture and agribusinesses, through developing skills and promoting entrepreneurship. In line with these considerations, NAEB's programs and activities must include women and youth as their target beneficiaries as well as key driving actors. Given the currently limited access of female farmers to agricultural inputs including seeds and fertilizers, extension services, and agricultural credits/loans than their male counterparts,[24] and low participation of youth

[24] NISR, 2018, Agricultural Household Survey 2017

in agriculture, NAEB will ensure that these sub-groups equality benefit from its interventions by targeting types of value chains and particular stages of value chains in which they are most involved.

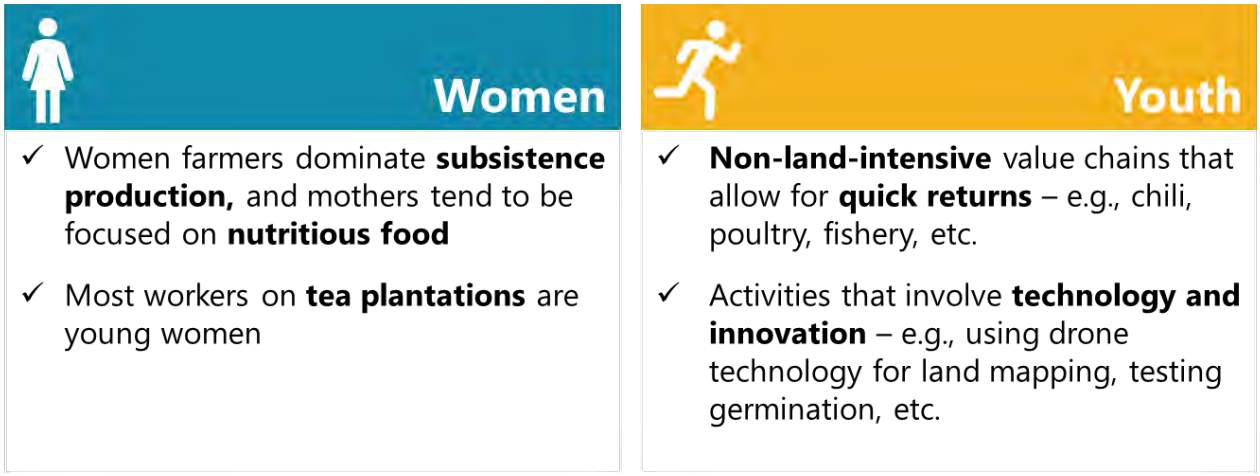
Value chain stages involving women and youth

Generally, women and youth tend to be involved in specific segments of a value chain. Women in Rwanda are heavily involved in production, often as farm workers, as their ownership of land is less common than that of men. They are also often employed at for factory work that involve being detail-oriented, e.g., product sorting and packing. Youth are less involved in the production stage, but more are interested in agribusiness opportunities in value-addition (through packaging and processing), trading (through aggregation, logistics, and storage), or marketing. Youth are also often encountered as factory or packhouse workers at the processing stage.

Types of value chain involving women and youth

Apart from women working in a few commercialized value chains, such as tea plantations or flower farms, most of women involved in agriculture are in subsistence farming, as they have limited access to the market and decision-making power in their family. Youth tend to be attracted to non-land/capital intensive value chains, and opportunities that allow quick and high returns. Youth, as they are much more inclined and open to adopting technology, can be engaged in jobs and activities that involve extension support and ag tech.

Figure 30: Types of value chains with women and youth involvement



Enabling women farmers and business leaders with access to inputs, financing, and other extension services, and supporting youth participation in farming and agri-businesses can improve productivity and promote innovation in the sector. NAEB can warrant diversity and inclusivity by including gender and youth indicators in its M&E framework and by tracking the share of youth and women who are direct beneficiaries of key programs. Further, as NAEB extends support to farmer cooperatives, we will encourage women participation in cooperative leadership as we prioritize beneficiaries of specific programs.

Environmental sustainability

Changing climate affects the mode of agriculture production, especially since most farmers in Rwanda rely on rain-fed agriculture with limited irrigation and drainage systems. For example, due to its

natural landscape, Rwanda is prone to experience landslides in the occurrence of heavy rainfall. Hence, terracing and conservation of the riverbanks and hillsides have been a focus of the environmental conservation efforts to protect agricultural productive land against perennial erosion. Furthermore, PSTA IV advocates for the sustainable use of resources and promotes environmentally friendly options for development in all stages of the value chains. With such understanding, NAEB seeks to promote climate resilience in agriculture value chains and environmental conservation by:

- Assessing the environmental implications of the new and existing value chains that NAEB supports, and ensuring that its interventions are environmentally friendly (or do not interfere with the environmental sustainability objective at the least)
- Supporting implementation of climate-smart agriculture practices
- Facilitate, coordinate, and support Rwandan agriculture exporters to take advantage of carbon credits between EAC members and the EU
- Continuously track carbon emissions vs. carbon credits of ag exports (both in production and in exports via air, roads, and sea)
- Continuing the preservation efforts of wetlands and terracing of the hillside farms
- Promoting agroforestry – planting tree crops such as macadamias around or among pastureland – to both reduce soil erosion and reap additional harvests and export revenues

These thematic considerations will be tracked by different teams and or committees within NAEB as detailed in the table below

Table 15: Thematic considerations implementing actors within NAEB

Activities	Point person/team within NAEB
Knowledge management	Planning Division; M&E officer
Human capacity development	HR and Administration Officer
Gender and youth	Officer of each value chain to oversee, and the M&E Officer to track results
Environmental sustainability	Officer of each value chain to mainstream environmental sustainability in interventions, and the M&E Officer to track results

II.3 SUMMARY OF GOVERNMENT-APPROVED PROJECTS TO BE IMPLEMENTED OVER THE COURSE OF THE STRATEGY

NAEB-led projects

project name	Description	Total budget (M USD)	Period	Relevant value chains	Supporting institutions	Other comments
Kivu Belt	Kivu Belt is a development project to promote tea, coffee and Macadamia value chain in western province. It will be developed on 16000Ha, with 2377Ha for Macadamia, 2057Ha for coffee and 12165Ha for tea. It will also help in erosion control through perennial crops	**79**[25]	2020 to 2034	Tea, coffee, Macadamia	RAB, Respective districts	This expansion will create two new tea factories with a capacity if 3000MT/year each by 2030, new 5 coffee washing station and 3 Macadamia collection centers
Kigali Wholesale Market	Kigali Wholesale Market (KWM) is a planned platform to create an organized market for fresh produce in Rwanda. The project will be located in Gasabo Special Economic Zone (SEZ) and will be serving Kigali and secondary cities' markets.	**36**	2019 to 2034	All fresh produces	RDB,PSF	The project will be implemented as a PPP where NAEB will partner with Kigali City and a Private sector partner, as key stakeholders. The project will indirectly benefit 1.5 million small holder farmers through increased market transparency
Green House for Vegetable production	The project consists of producing fresh produce in protected greenhouse technology over an area of 1200Ha	**191**	2019 to 2024	Horticulture (vegetables)	RAB, Respective districts, PSF	
Flower park (Gishali, Nyacyonga)	Production of roses and high value summer flowers for exports. Target area is 200Ha	**13**	**2016-onward**	Roses and summer flowers	Bella Flower	The project is executed by private Japanese company and Bella Flower, a GoR commercial company

[25] Investment up to 2024, production will take place in subsequent years

Sunfresh	Horticulture project on consolidated land of ~250Ha. It is a joint venture between NAEB and Prodev, a private Rwandan company.	**0.7**	**2017 Onward**	Horticulture (French Beans, chili, potato); Maize	NAEB, RAB, Sunfresh	Sunfresh is a joint venture between NAEB and PRODEV, a private company
Tea expansion (Unilever, Luxmi)	Tea plantation and factory set up by two big investors in partnership with farmers and the Wood Foundation. The tea plantations will be located in two districts: Nyaruguru and Karongi	**50, each**[26]	**2016 Onward**	**Tea**	RDB,PSF, Unilever; Luxmi	The project is a joint venture between Wood foundation, farmers and the respective companies

Projects implemented by other government institutions, with impact on exports revenues

Project name	1-2 sentence description	Total budget (M USD)	Period	Relevant value chains	Implementing institutions
Gako Beef	Gako Beef is PPP project including integrated forage production, intensive cattle production, fattening, and meat processing. It covers a total of gross area of 6000ha of which 1050ha has been identified for irrigated forage to support beef production.	**22**	2019 to 2024	Beef and Goats	Lead implementer: PSF Supporting institutions: NAEB, RAB
Gabiro	The project aims to irrigate 15,600 Ha of land in Eastern province for farm development. Private sector players are invited to lease plots for farm development (70% commercial farming / 30% smallholder). The project is expected to help save up to 60% of water due to drip irrigation technology.	74M USD for project phase 1	**2020-2024**	Horticulture (citrus, vegetables, avocado, tomato); Cereals (Maize); maize, livestock, soy	Lead implementer: PSF Supporting institutions: NAEB, RAB
Export Targeting Modern	The objective of the Project is to improve the productive potential of the identified command area in the Mahama, Mpanga and Nyamaguli sectors of Kirehe district by providing irrigation	120.05	2018 – 2037	Maize, pulses, tomatoes, other	Lead implementer: MINAGRI, RAB

[26] Investment period is up 2034 as MOU ref: article 5.1.17

Irrigated Agriculture Projects in Rwanda (ETI)	facilities using pumped water from Akagera. This will also include Watershed Treatment Technology in arable / non-arable land through drainage line treatment and other structural measures in the project area, to improve and develop the land for conservation of soil and reduction of erosion, in support of for long term sustainable agriculture growth. This is an integrated intervention covering identified 7000ha area. The farm output from the project will be further processed and exported in nearby countries after value addition. Besides, the project will include a center of excellence for advanced R&D in farm mechanization for the entire country.			horticulture products, etc.	

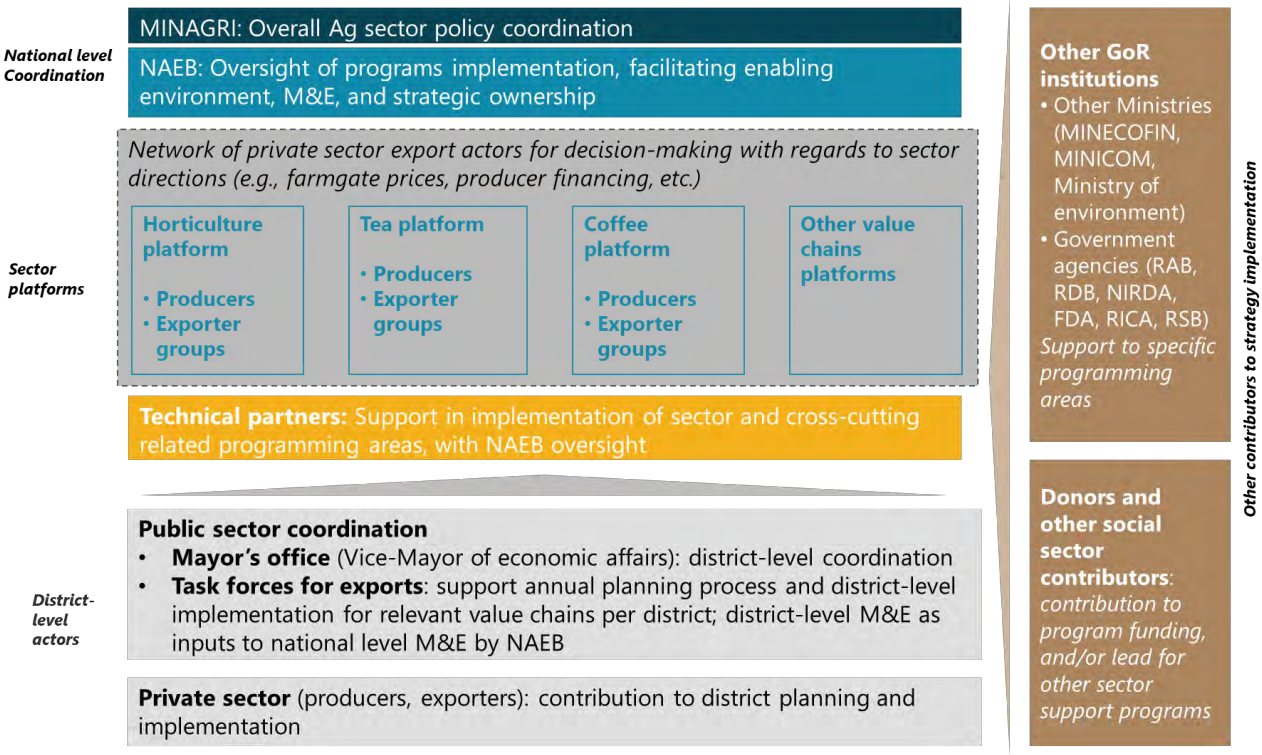
Strategy implementation, funding, and impact

SECTION III

III.1 COORDINATION FRAMEWORK AND IMPLEMENTATION FUNCTIONS

Implementation of the strategy will require national level coordination by NAEB of technical partners and sector platforms, in addition to implication and ownership by district-level actors, as summarized in the coordination framework below.

Figure 31: Strategy coordination framework



NAEB core functions

NAEB's core functions are paramount to ensure successful implementation of the strategy and must, therefore, work in synergy to ensure implementation of key programming areas as well as supporting interventions. Based on NAEB's revised structure, the key functions required for the implementation of the strategy are summarized in the table below and illustrated in Annex IV.5. These departments will work in synergy to deliver on NAEB's mandate which involves: (i) productivity and value addition; (ii) new export products development; (iii) quality assurance of exported products; (iv) marketing; and (v) policy advisory and implementation.

Table 16: NAEB's core functions for strategy implementation

Key departments / functions	Role	Corresponding programming areas
CEO office	Coordinates operations of all divisions and oversees programming areas involving external partners with a leading execution role, to provide directions for programs based on NAEB's priorities. Uses strategic analytics inputs to make key decisions around new investments, programs, and potential program pivots.	All

Export market development and innovation division	In charge of market identification and continued innovation related to export commodities, including new diversification markets.	Market linkage, Branding, Global operator attraction, Business incubation
Value Chain Development & Regulation office	Ensures quality production across traditional and emerging commodities, and compliance with quality and safety regulations in relationship with market requirements.	Global operator attraction, Business incubation, Quality production, and productivity management
Chief Finance Office	Oversees organizational planning, export services to exporters (e.g., packhouse, warehouses, etc.), and finance and administration related needs.	Exports logistics and infrastructure, financing

Government implementing partners

- In addition to its core functions, NAEB will associate existing partners in and outside of government and will seek new ones to lead, co-lead or support execution of specific programs. NAEB's Government counterparts that influence agricultural exports and which NAEB will collaborate closely with include RDB, MINAGRI, RAB, Ministry of environment, and MINIMICOM. Beyond the national level, district-level actors will play a key role across implementation of all programming areas, in value chains relevant to those districts. Specific roles for government and non-government partners are detailed in the following tables.

Government partners

Table 17: NAEB's government implementing partners

Partners	Programming areas	Key programs and role
RDB	Global operator attraction	• **Operator attraction**: Co-lead implementation by marketing business cases, attracting global operators and leading deal negotiations
		• **Establishment facilitation and post-establishment support**: Co-lead implementation by providing support in business registration
	Business incubation (via Kigali Innovation city – KIC)	• **Agriculture support businesses support:** lead implementation
	Exports logistics & infrastructure coordination	• **Infrastructure and logistics support for perishable products for international export markets – Increase air freight capacity**: attracting global air freight operators and identifying sources of finance
MINAGRI	Global operator attraction	• **Opportunity identification**: Support land mapping and planning
	Productivity and quality management	• **Land mapping and planning**
	Policy and regulatory support	• **Land access policy regulation**
RwandAir	Global operator attraction	• **Operator attraction:** Support in attracting global air cargo operators to run flights from Kigali
RAB	Productivity and quality management	• **Demonstration farms**: Provide new crop varieties and products
		• **R&D:** Lead implementation, with NAEB's advisory
National Industrial Research and Development Agency (NIRDA)	Productivity and quality management	• **R&D**
Ministry of environment	Policy and regulatory support	• **Land access policy**
Ministry of Local Government (MINALOC)	Policy and regulatory support	• **Land access policy**
Ministry of Trade and Industry (MINICOM)	Policy and regulatory support	• **Trade policy**
Rwanda Standards Board (RSB)	Policy and regulatory support	• **Quality and safety regulation**
Rwanda Food and Drugs Authority (FDA)	Policy and regulatory support	• **Quality and safety regulation**
Rwanda Institute for Conservation Agriculture	Policy and regulatory support	• **Quality and safety regulation**

Rwanda law reform commission	Policy and regulatory support	• **Land access policy** • **Trade policy** • **Quality and safety regulation**
District-level Mayor's offices	**All programing areas**	• **Vice-Mayor of economic affairs**: District-level coordination • **Task forces for exports**: support annual planning process and district-level implementation for relevant value chains per district; district-level M&E as inputs to national level M&E by NAEB

Non-government partners

Table 18: NAEB's non-government implementing partners

Programming areas	Description of ideal implementing partner type by role and by specific programs
Branding	**Lead/co-lead in implementation** **Leverage international events in Rwanda and abroad to advertise Rwandan brands:** Marketing companies with extensive experience in international events coverage **Support in implementation** **Develop and communicate content behind Rwanda brands**: organization with expertise in traceability, quality assurance, and product profiling.
Market linkage	**Lead/co-lead in implementation** • **Develop a market information system (MIS):** Organization with good analytics capabilities, access to key agricultural exports market data and experience in building similar tools. • **Support exporters in strengthening relationships with new and existing buyers:** organization involved in similar initiatives or work with a large network of buyers in the global north, and other relevant markets, coupled with good delivery capacity to help nurture buyers relationships. • **Support exports through local physical marketplaces and e-commerce platforms:** Organization with experience in coordinating marketplaces and facilitating agricultural products sales and auctions. **Support in implementation**: N/A
Global operators attraction	**Lead/co-lead in implementation**: N/A **Support in implementation** **Operator attraction:** organization with strong established network with global operators in specific value chains production
Business incubation	**Lead/co-lead in implementation** • **Established value chains business incubation:** Organization involved in similar incubation work with a successful record in markets similar to Rwanda.

	• **Innovation experimentation in new growth value chains:** Ibid **<u>Support in implementation</u>** **Ag tech and innovation businesses incubation:** Ibid.
Productivity and quality management	**<u>Lead/co-lead in implementation</u>** **Exporter-farmer clusters:** Exporters aggregating from out-growers **<u>Support in implementation</u>** • **Exporter-farmer clusters:** o Technical assistance providers –institutions with expertise in agronomy, post-harvest handling, and quality management in the specific value chains. o Financial institutions providing agricultural loans. • **Demonstration farms**: Institutions with agricultural research capabilities (e.g., NGOs, universities), or with technical production knowledge in line with destination market requirements • **R&D:** Institutions with agricultural research capabilities (e.g., NGOs, universities).
Exports logistics & infrastructure coordination	**<u>Lead/co-lead in implementation</u>**: N/A **<u>Support in implementation</u>** **Infrastructure and logistics support for perishable products:** Global logistics operators.
Financing	**<u>Lead/co-lead in implementation</u>** **Facilitate input financing schemes for specific value chains in collaboration with the private sector**: Exporters involved in co-financing farmers within their respective supply chains for inputs access. **<u>Support in implementation</u>**: N/A
Strategic analytics	**<u>Lead/co-lead in implementation</u>** **Support other programming areas and problem-solving and continuous strategy improvement:** Organization with strong data analytics capabilities, while bringing in a strategy lens, to focus efforts on the areas that need attention the most. **<u>Support in implementation</u>**: N/A

III.2 BUDGET

Implementation of the strategy will require 375.2 million USD, from a combination of sources, in line with PSTA 4, including GoR funding, internal NAEB revenues, and donor funding. The total cost for the NAEB strategy between 2019-2020 and 2023-2024 is estimated at 180.3 million USD for NAEB's development activities typically covered by GoR funding. This funding will be complemented by 16 million USD from NAEB's internally generated funds to cover recurring NAEB's functioning cots, as NAEB becomes a self-sustaining institution financially. In addition to public sector funding, achieving the ambitious strategic targets will require an additional 179 million USD to develop and implement key programs across the nine programming areas, in collaboration with world-class institutions. All funding combined amount to 375.3 million USD, as detailed in the table below.

Figure 32: Strategy implementation costs, NAEB Strategy 2019-2024 in line with PSTA 4

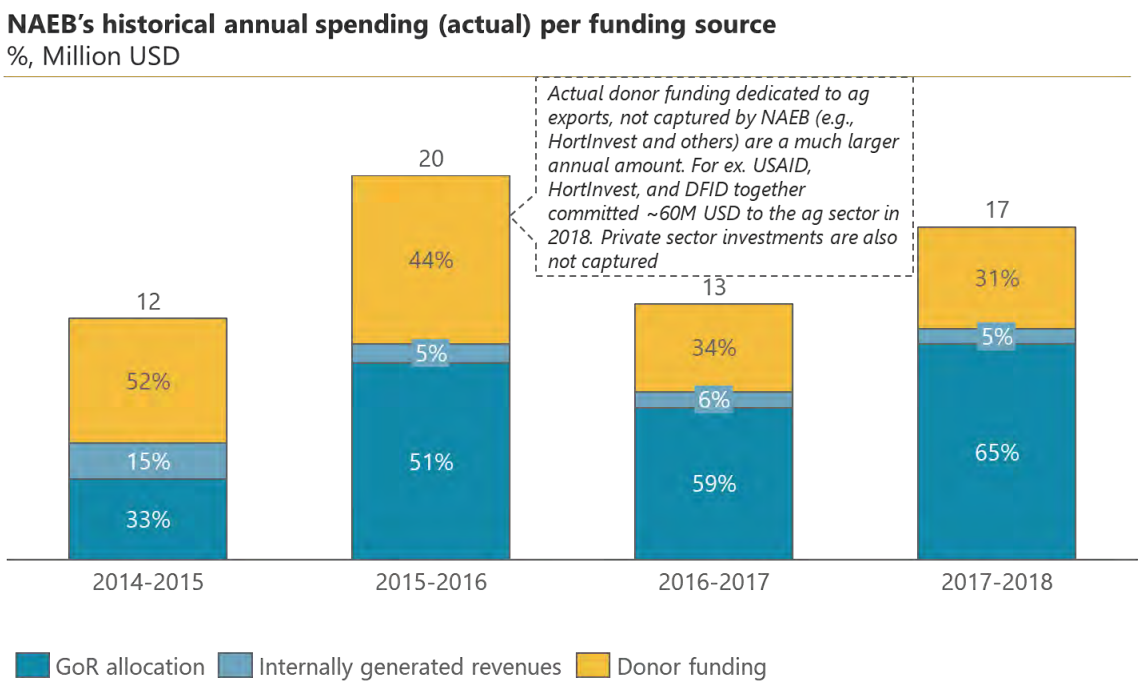
Strategy implementation costs, and comparison with PSTA 4 (USD)

	PSTA 4	NAEB STRATEGY	
Item	**PSTA Total (2018 – 2024)**	**Average annual cost**	**Total (2019 – 2024)**
GoR budget[1]	$2.6 billion	$36.1 million	$180.3 million
NAEB's internal funding	NA	$3.2 million	$16 million
Private sector contributions	$0.46 billion	$218 million[2]	$1.09 billion[2]
Development partners' funding	*Not, or partly included*	$35.8 million	$179 million
Total	**$3.1 billion**	**$75 million**	**$375.2 million**

1 Includes GoR allocated budget; donor funding through GoR budget
2 Private sector funding is not considered as part of NAEB's budget to implement the strategy, but is accounted for as part of investments catalyzed

The increase in the 2019-2024 strategy implementation costs align with the new ambitious goals set out in PSTA IV, and its funding sources are in line with the historical trends. The total estimated costs for strategy implementation increased from 93 million USD for the 2013-2018 strategy to 375 million USD. This is consistent with the increase in the PSTA implementation costs, from 848 million USD for PSTA III to 3.1 billion USD for PSTA IV. Historically, NAEB has financed its implementation costs with GoR budget (33-65%), donor funding (31-52%), and internally generated revenues (5-15%). For the 2019-2024 strategy, 48% of all implementation costs will be funded by Government budget, 48% by donor funding, and 4% by internally generated revenues.

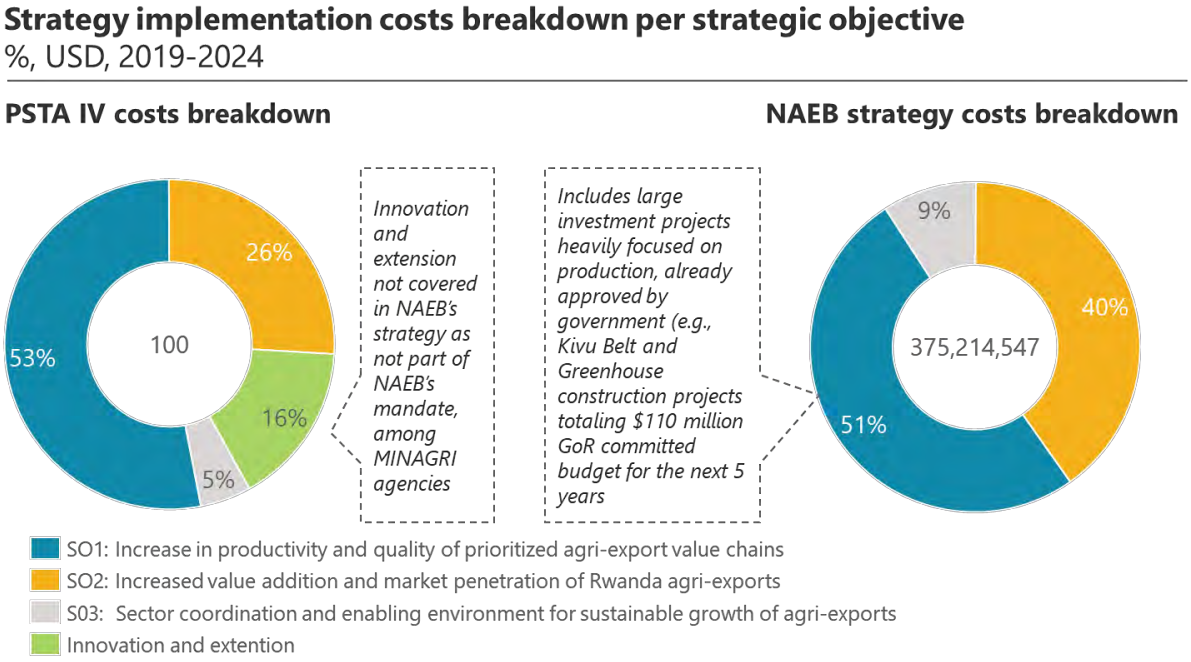
Figure 33: NAEB's historical financials (Actual), USD



Source: NAEB past financials

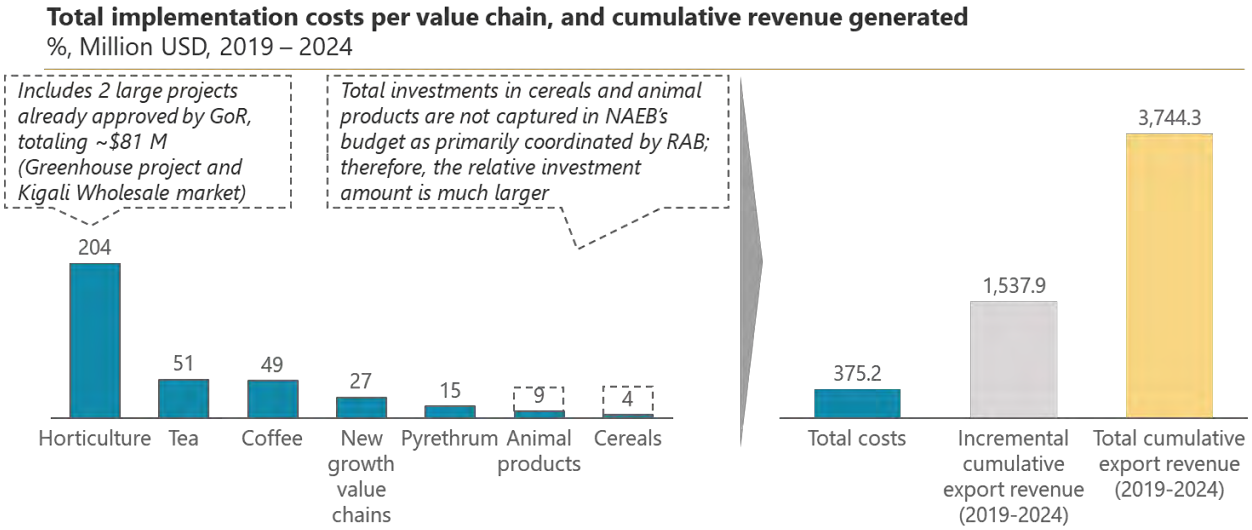
As the main agency in charge of agriculture marketing, NAEB's strategy puts a greater focus on value addition and market (40% of total budget) to achieve exports targets. The strategic objectives under NAEB's strategy align with three priority areas under PSTA IV, which include productivity and resilience (Priority Area II), inclusive markets and value addition (Priority Area III), and enabling environment and responsive institutions (Priority Area IV). While 53% of PSTA IV implementation costs are dedicated to increasing production and productivity and 26% to value addition and market penetration, NAEB's strategy implementation costs focus more heavily on the second strategic objective, with 40% of all implementation costs dedicated to increasing value addition and market penetration of Rwandan ag exports. Although the strategy makes a major shift from production and productivity comparing to NAEB's traditional approach, large investment projects heavily focused on production, already approved by government (e.g., Kivu Belt and Greenhouse construction projects) totaling $110 million GoR committed budget for the next 5 years result in a significant high portion (51%) of NAEB's budget allocated to production and productivity.

Figure 34: Strategy implementation costs breakdown per strategic objective, PSTA IV and NAEB strategy



Nascent value chains will require the most incremental costs to yield substantial returns. Horticulture, tea, and coffee respectively, account for the largest cost components, while tea yields the highest returns on incremental investments. It is important to note that as the most nascent value chain to drive massive export growth, horticulture holds the largest cost component but will generate returns on investments that will reap export revenues for several years beyond the duration of the strategy. Finally, value chains such as cereals and animal products will require more funding than included in NAEB's budget given these value chains are primarily coordinated by RAB; therefore, the relative investment amount is much larger.

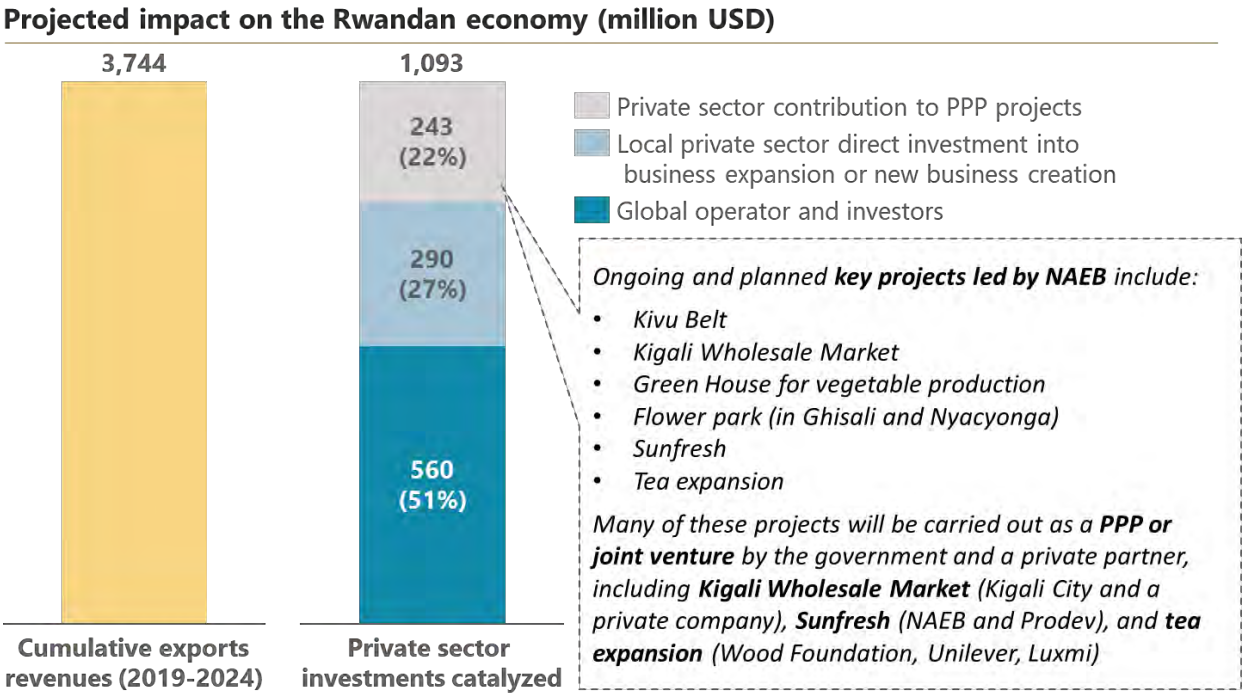
Figure 35: Total spending compared to incremental output per value chain, USD



III.3 PROJECTED IMPACT OF THE STRATEGY

The implementation of the strategy over the course of the upcoming five years will have far-reaching economic and social impact on Rwanda, including catalyzing private sector investments worth 1 billion USD, creating over 313,000 jobs, and supporting 525,000 farmers. Key programs implemented under the 2019-2024 strategy are projected to bring a cumulative exports revenue of 3.7 billion USD during the five-year-period and to catalyze over 1 billion USD in private investments from the local private sector, global operators and investors attracted to Rwanda, financial institutions and patient capital providers.

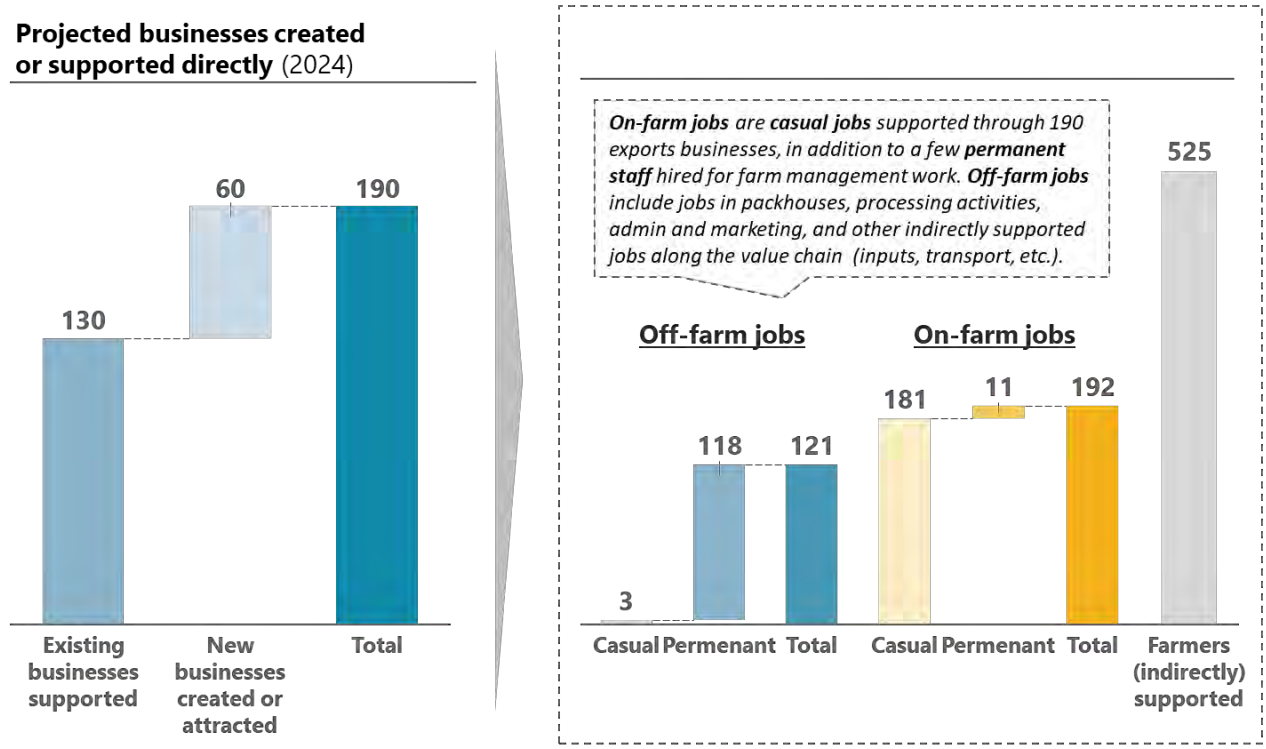
Figure 36: Projected impact of the strategy implementation on the Rwandan economy



1 Private sector funding includes PPP projects included in full costs in NAEB's development costs budget; Other private sector investments, outside of PPPs, often large in nature, are not part of NAEB's functioning costs to implement the strategy, but are considered as a separate impact component in terms of investments catalyzed in the sector

The strategy implementation will also improve livelihoods of Rwandans through attracting or creating 60 new businesses while supporting 130 existing businesses across value chains, and through jobs, including over 313,000 new on-farm and off-farm jobs, as well as supporting the livelihoods of over 525,000 smallholder farmers.

Figure 37: Impact of the strategy on businesses and job creation



Source: Dalberg analysis, 2019
1: Jobs created in horticulture, tea, and new growth value chains

The strategy's impact will build up progressively over the upcoming five years, as key interventions are implemented. The following table provides the estimates of the strategy's impact in annual breakdown. The growth in the scale of impact and will accelerate over the five-year-period, in line with planned interventions under the strategy.

Table 19: Impact of strategy annual breakdown

Year	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	Total
Annual export revenue generated (M USD)	**593**	**643**	**706**	**801**	**1,001**	**3,744**
Private sector investments attracted (M USD)	**15**	**126**	**148**	**506**	**299**	**1,093**
Private sector contribution to PPP projects	-	31	31	155	26	243
Local private sector direct investments	15	39	61	71	104	290
Global operator and investors	-	56	56	280	168	560
Businesses supported	**13**	**26**	**34**	**46**	**71**	**190**
Existing businesses supported	13	17	21	27	52	130
New businesses created	-	7	13	14	16	50
Businesses attracted		2	-	5	3	10
Social impact outcomes						
New jobs created	21,424	42,847	56,031	75,807	117,006	**313,115**
Number of farmers supported	49,200	68,090	94,371	131,000	182,147	**524,809**

III.4 FUNDING MOBILIZATION STRATEGY AND SUSTAINABILITY

NAEB will work closely with key partners to raise funding from development partners to complement GoR funding. GoR funding has already committed for major NAEB projects over the next five years. The next big source of funding to complement GoR funding is donor funding. A portion of this funding will be harnessed by ensuring funding allocated to export commodities by existing donors to the agriculture sector are oriented towards the directions for the NAEB strategy and therefore contribute to achieving overall sector goals. NAEB aims to secure the rest of donor funding required by leveraging its partners with access to donor networks to raise funds from both existing and new donors towards funding of key programming areas. While fundraising for all programming area costs may not be guaranteed, NAEB will work with partners to attract funders with interest in specific priority programming areas to ensure implementation of majority of these.

Further, NAEB envisages to become self-sustainable, starting from 2020-2021, in line with its new legal status. NAEB recognizes the need to move towards a sustainability model in financing its operations. Therefore, from the year 2020-2021, 100% of NAEB's recurring/functioning costs will be covered by internally generated fees by NAEB. These include:

- Fees generated from NAEB's investments in companies (shares in companies such as Sunfresh, Bella Flowers, Rwanda Farmers Coffee Company, etc.),
- Management fees for large GoR projects
- Service fees based on services provided to exporters – e.g., packhouse, cold truck, warehousing, etc.; and
- Revenue from commodity-linked fees such as fixed fees set on exported coffee and tea

NAEB's projected internal revenues in comparison to recurring costs for the next five years are summarized in the table below.

Table 20: NAEB's financial sustainability summary

	19-20	20-21	21-22	22-23	23-24	Total
Internally generated revenue[27]	785,891	4,039,776	4,941,335	5,579,618	5,810,388	21,157,008
Recurrent Cost	2,780,283	2,974,903	3,183,146	3,405,966	3,644,384	15,988,682
Surplus/(Deficit)	**(1,994,392)**	**1,064,873**	**1,758,189**	**2,173,652**	**2,166,004**	**5,168,326**

Source: NAEB's calculations, 2019

III.5 RISK ANALYSIS AND MITIGATION STRATEGIES

The NAEB strategic business plan 2019-2024 and its implementation are exposed to various external and internal risks, which the strategy has already taken into account in the analysis of the sector and plans to retain, mitigate, or eliminate their sources through the planned programs in the

[27] Assumptions informing projected export revenues are included in annex. Some of the projected income sources such as fees on exported coffee are yet to be approved by government and therefore are accounted for, only from 2021

strategy. External risks, which are external to NAEB and therefore often uncontrollable by NAEB, include market risks, regional political risks, environmental risks, and risks in enabling environment. Internal risks, arising from within the organization and during the operations, include sustainability risks and financing risks. The tables below illustrate potential risks to the strategy implementation, and NAEB's planned strategies to mitigate them.

Table 21: External risks and mitigation strategies

Description	Mitigation strategies
Market / economic risks	
Global macroeconomic recession	To minimize the impact of a global economic downturn on Rwandan ag exports, we retain our focus on exports to the regional market, which are less likely to be affected by the global economic trends, in the current strategy. To further mitigate the risk, we will also consider broader intra-African trade opportunities, outside the EAC.[28]
Market volatilities – Lower/Fluctuating global demand or prices for specific products or specific markets	• We will support exporters to establish linkages with large buyers who can offer more consistent prices year-round, through Market linkage programs • We also intend to support exporters to meet quality and safety standards requirements and secure greater and more consistent volumes, to be able to supply to large buyers, through Business incubation and Productivity and quality management programs. • Leveraging analytical insights provided through the MIS or DSM, the private sector can make an informed decision on diversifying its value chain offerings or target markets.
Rise of competition due to increased number of competitors	• Capacity building, increased access to quality inputs, and improved production and post-harvest infrastructure, made available through Productivity and quality management programs, will enhance Rwandan exporters' capability to compete on quality or price.
Regional political risks	
Exacerbation in relations with neighboring countries leading to increased trade barriers	• We have already accounted for these risks in our value chain growth projections and prioritization. While focusing on high growth potential value chains that mostly target international markets, we also intend to explore opportunities of exporting to the rest of the African continent beyond the East African regional market.
Improved stability in the region, leading to lower demand for certain products	
Environmental risks	
Climate change (e.g., changing rainfall patterns and increased	• To mitigate against this risk, the strategy includes support in improving access to reliable and adequate irrigation

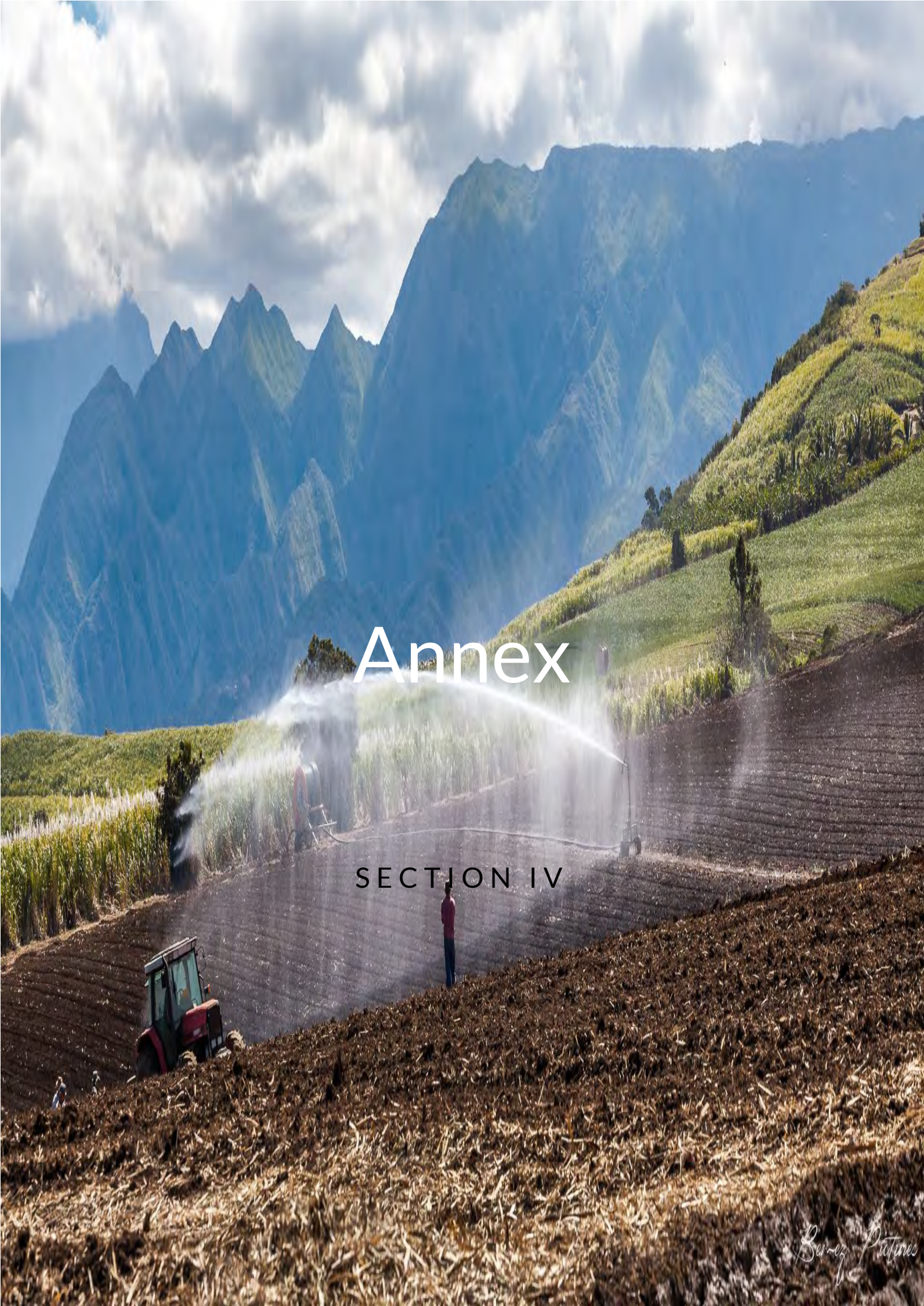
[28] Opportunities in other African countries outside of the EAC for all priority crops is further assessed separately

unpredictability in weather)	infrastructure, as well as protecting the environment by promoting safe agriculture practices • Depending on the crop and regional needs, we will consider additionally supporting farmers and exporters with better water management and flood control systems. • Land mapping and planning exercises and identification of potential new growth value chains will take these risks into account – e.g., identifying available farmlands that may not be as severely affected by heavy rains, and identifying and diversifying into crops that are resilient to the changing climate.
Enabling environment risks	
Limited logistics capability (e.g., few airfreight operators attracted, or major breakdown of existing routes provided by existing flight operators)	• The strategic plan caters for this risk under the Logistics & infrastructure coordination programming area, and suggests three interim or long-term strategies to expand capacity of existing export channels
Policy and regulations bottlenecks in attracting global operators and investors, and local businesses and creating a good business environment for them	• Recognizing the importance of policy and regulatory environment in supporting the growth of the ag exports sector, this strategy includes efforts to influence favorable policy formulation. • Establishment facilitation and Post-establishment support programs, under the Global operators attraction programming area, are designed to ensure that global operators are able to smoothly establish, continue, and expand their businesses in Rwanda.
Other institutions failing to deliver their mandates (e.g., delayed establishment of infrastructure required for exports, such as irrigation, roads, etc., due to responsible institutions not securing financing)	• NAEB will disseminate the strategy and communicate as proactively as possible with other institutions in charge of implementing key GoR programs, to ensure respective institutions are aware of timelines for key NAEB targets and the implication on timelines for implementing priority components of their respective programs.

Table 22: Internal and operational risks and mitigation strategies

Description	Mitigation strategies
Sustainability risks	
Uncertainty in being able to sustain the growth beyond the upcoming five years, after the current strategy	• The strategy caters for setting the important pre-requisites for exports growth to continue beyond the next five years. In fact, we have identified and included in the strategy, potential new growth value chains for NAEB to start investing in today, in order to reap fruits in the next five years and beyond. These emerging value chains, while currently small (in terms of export revenue) and nascent in Rwanda, could become major growth drivers in the

	next five years with the right level and form of support in implementing the current strategy. • Simultaneously, strategic analytics will allow NAEB to continuously improve the strategy's focus by making informed, timely and targeted decisions in response to the changing sector realities, and by systematically identifying ongoing challenges in the sector and problem-solving.
Limited implementation capacity	• To ensure successful implementation of the strategy, we have assigned each program to specific roles in NAEB, and plan to leverage world-class partners to work closely with the NAEB team in areas where we don't have the capabilities to implement • Over time, we will strongly encourage and actively facilitate the skills and knowledge transfers from the partners to pertinent teams at NAEB, to capacitate the organization and its staff. • Under the new organizational structure, we will hire qualified staff with expertise in agronomical practices, finance, sales and marketing, logistics, etc. Providing a competitive salary and employee benefits package could attract and increase the retention of qualified staff.
Financing risks	
Insufficient funding due to NAEB not securing the full funding amount required	• Conscious of the fact that scarce government resources may not be fully allocated to NAEB or that NAEB's fundraising goals may not be reached, the strategic plan prioritizes programs under each programming areas. In the case of insufficient funding, we will first implement programs with high priority.



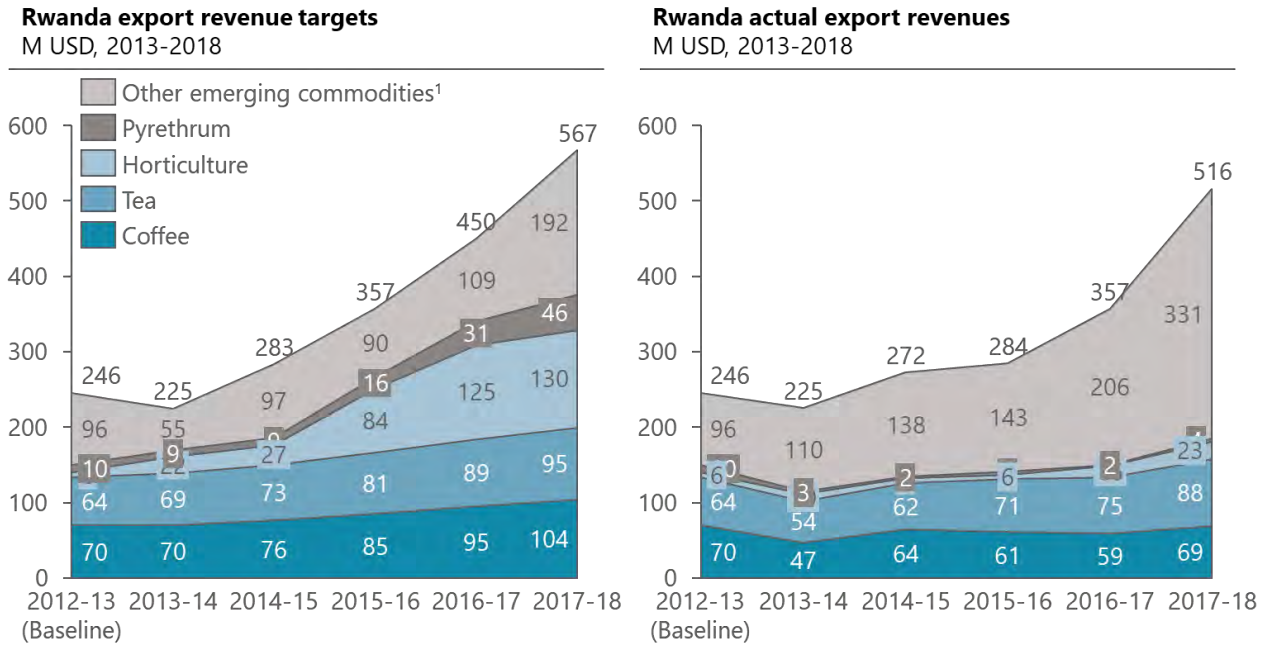
Annex

SECTION IV

IV.1 ASSESSMENT OF PAST STRATEGIC PLAN (2013-2018) AND IMPLICATIONS

Under NAEB's leadership, Rwanda's agricultural exports grew rapidly, with annual revenue reaching 516 million USD in 2017-2018, close to the overall goal of 567 million USD set by the previous NAEB strategic plan. Tea and other emerging commodities exceeded or reached close to the targeted projections either in absolute terms or in their pace of growth, while coffee, horticulture and pyrethrum did not meet their targets of aggressive growth. Tea exports reached 88 million USD in 2017-2018, close to the target of 95 million USD, and grew at a similar CAGR of 7% to the expected rate of 8%, from the 2012-2013 baseline. Coffee exports revenue fluctuated and overall remained at the same level due to shifting global prices and various challenges in the sector. Pyrethrum exports struggled as the sector experienced an unexpected global market shift and plummeting of the price as a result, while horticulture's slower growth could be partly explained by gaps in implementation of planned activities. Meanwhile, other emerging commodities including cereals and animal products experienced substantial growth beyond expected targets, allowing Rwanda ag exports to meet its overall targets.

Figure 38: Rwanda annual agriculture export revenues, targets and results



Souce: NAEB, 2015, Medium Term Strategic Plan 2013-2018; NAEB, Annual Reports 2012/2013-2016/2017
Note: Total export revenue targets between 2014-2015 and 2016-2017 were calculated based on the linear growth assumption
1: Other emerging commodities includes all other value chains except for tea, coffee, pyrethrum, and horticulture

Outcome and output indicators in 2017-2018 show that overall progress has been made since the baseline in 2012-2013, but shortcomings in the outcomes partly contribute to the gaps observed in the export revenue performance. The 2013-2018 strategic plan had set four main objectives to achieve the overall and specific targets, including: i) to increase production and productivity of ag export commodities; ii) to enhance value and quality of ag export commodities; iii) to improve business environment for ag exporters; and iv) to enhance inter-institutional coordination and NAEB's capacity in supporting ag exports. The below table shows outcome indicators under each strategic objective, the baseline figures in 2012-2013, the previous strategic plan's targets for 2017-2018, and the actual

outcomes in 2017-2018. Between 2012-2013 and 2017-2018, productivity increased in coffee and pyrethrum. Gaps in tea yields are explained by the rise of new tea plantations, still at an early stage, who often record much lower yields in their first years of existence – sign of rising investments in the tea sector. The percentage of annual increase in export volumes rose more than expected, however, this indicator does not capture the growth trend over the years, and whether it is a one-time increase or a sustained growth. Other indicators have not been fully tracked and will be captured in a follow-on detailed assessment of the previous past NAEB strategic plan.

Table 23: Strategic plan 2013-2018 outcomes: baselines, targets, and actual results

Strategic objectives	Outcome Indicator	Value chain	2012-13 Baseline	Targets in 2017-18	Result in 2017-18
Increase farm production and productivity of the targeted agricultural export commodities	Yield (MT/ha)	Tea Coffee Pyrethrum Horticulture	6.8 2.2kg/tree 0.25 N/A	9.0 3.1kg/tree 1.3 N/A	6.3[29] 3-4.4kg/tree 0.5 N/A
	% increase in export volumes (from the previous year)	Tea Coffee Pyrethrum Horticulture	-1.20% 0.07% 55% F&V: 4% Flowers: 0%	7% 10% 92% 20% 50%	7% 9% 149% 13%
Enhance value and assure quality of agriculture export communities to increase their demand and price on national, regional and international markets	Share of value-added final products vis a vis total production within priority export value chain per annum (%)	Tea Coffee Pyrethrum Horticulture	<1% 1 N/A N/A	2 5 5 20 (F&V)	N/A
Improve business operating environment through providing effective trade support services	Percent increase in private sector investment in agriculture export commodity	N/A	79.8 million USD	15%	N/A
	Value agricultural export products (million USD)	Tea Coffee Pyrethrum Horticulture	63.9 69.7 9.7 6.1	94.9 104.3 46.2 129.6	88.1 69.4 3.7 23.4
Enhance inter-institutional coordination and strengthen the capacity of NAEB and agricultural export support institutions to effectively provide adequate services to the sector	% of trained professionals who apply acquired skills in developing export-oriented agribusiness sector		40%. professionals trained in export oriented agribusiness sector	At least 80 % professionals will be trained in export oriented agribusiness)	N/A
		Tea Coffee	15 89	19 229	N/A

[29] Difference explained by the rise of new tea plantations, still at an early stage, who often record much lower yields in their first years of existence.

	No. and % of total cooperatives and farmer organizations which apply improved managerial and business skills	Horticulture	(F&V) N/A	60%	
	Updated, effective and streamlined legislation, regulation and strategies aligned with government policies and targets		Horticulture subsector strategy, old coffee and tea regulations	Horticulture, tea, coffee, new emerging chains development policies, regulations and strategies In place	N/A

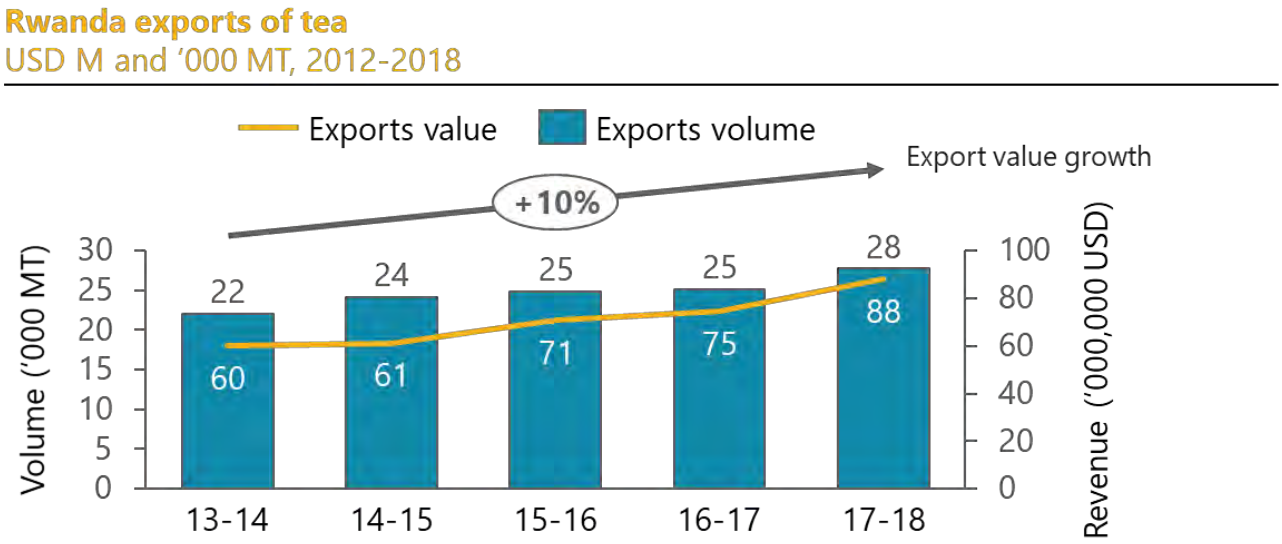
Key learnings from the previous strategy point to important priorities that inform the 2019-2024 strategy formulation. The rapid assessment of the NAEB's performance in the previous strategy points to the need for i) detailed and rigorous analysis on growth drivers to set targets for specific value chains; ii) programming areas that align with new ambitious targets and ensuring appropriate funding in delivery; iii) clearly defined and assigned roles to the implementer (NAEB team or external partner); and iv) aggressive approach in implementation leveraging both NAEB's internal capability and external stakeholders who can accelerate growth. The NAEB Strategic Plan 2019-2024 aims to fill the gaps observed from the 2013-2018 strategic plan, in order to achieve its 1 billion USD annual export revenue goal by 2024.

IV.2 VALUE CHAIN PERFORMANCE AND OUTLOOK – DETAIL

Tea sector performance and outlook

Past export trends

Figure 39: Rwanda tea exports trends

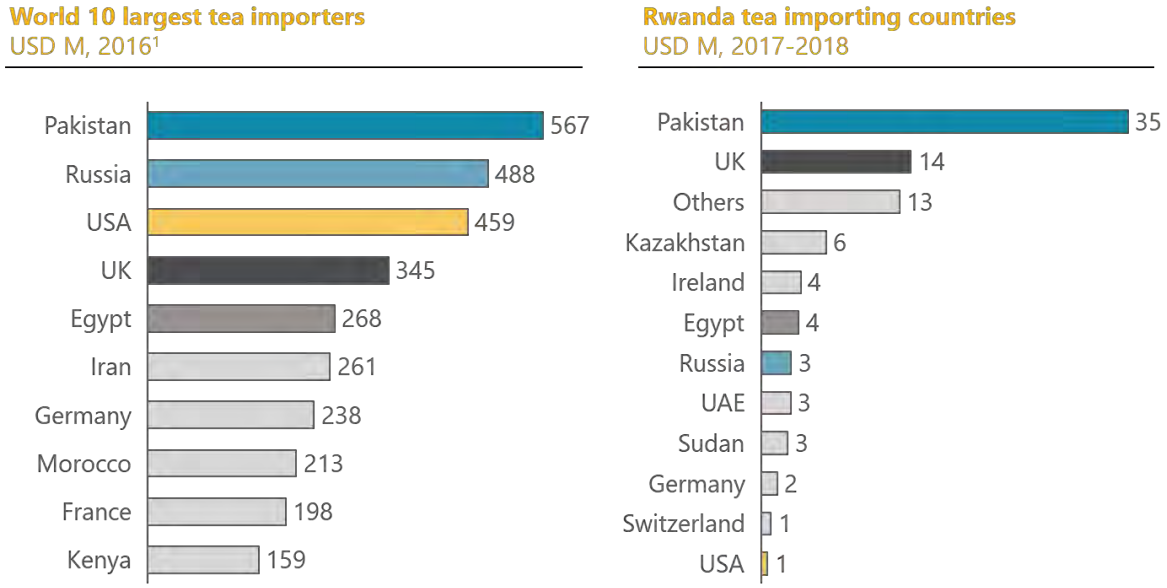


Source: NAEB Annual Report, 2012/2013-2016/2017, NAEB, 2018, Strategic Business Plan 2019-2024, Dalberg analysis, 2019

- **Tea is one of Rwanda's leading cash crops for over a decade**. It has experienced annual growth of 10% between 2013 and 2018,[30] reaching 88 million USD in 2018, representing 0.18% of the global tea market.[31]
- Rwanda's tea holds a unique quality and favorable plantations set-up for competitive production. Rwanda possesses unique climatic and soil conditions and consolidated tea plantations with anchor farms and smallholder out-growers that allow it to produce quality tea competitively. These unique advantages, among other factors, have attracted global brands such as Unilever and Luxmi to set up operations in Rwanda.
- Tea is one of the leading employers among agriculture exports sectors, with over 42,840 farmers involved in production expanded over 26,897 ha of land.[32]
- **Rwanda exports tea to leading global importers such as Pakistan, UK, Egypt, Russia, and the USA, with Pakistan and the UK, respectively, being the largest buyers.** In 2017-2018, Rwanda exported over 52% of its tea to Asia, led by Pakistan, and 28% to Europe, led by the UK. Other major buyers include Kazakhstan, Ireland, Egypt, Russia, UAE, and Sudan to name a few. The five largest buyers of tea globally are Pakistan, Russia, USA, UK, and Iran.[33] The figure below presents Rwanda's tea exports destinations in comparison to the largest tea buyers.

[30] Dalberg analysis, 2019
[31] Dalberg analysis, 2019
[32] NAEB, 2017, 2016-2017 annual report
[33] World's Top Exports (WTEx), 2019, Tea imports by country

Figure 40: Rwanda tea importing countries and world largest buyers of tea



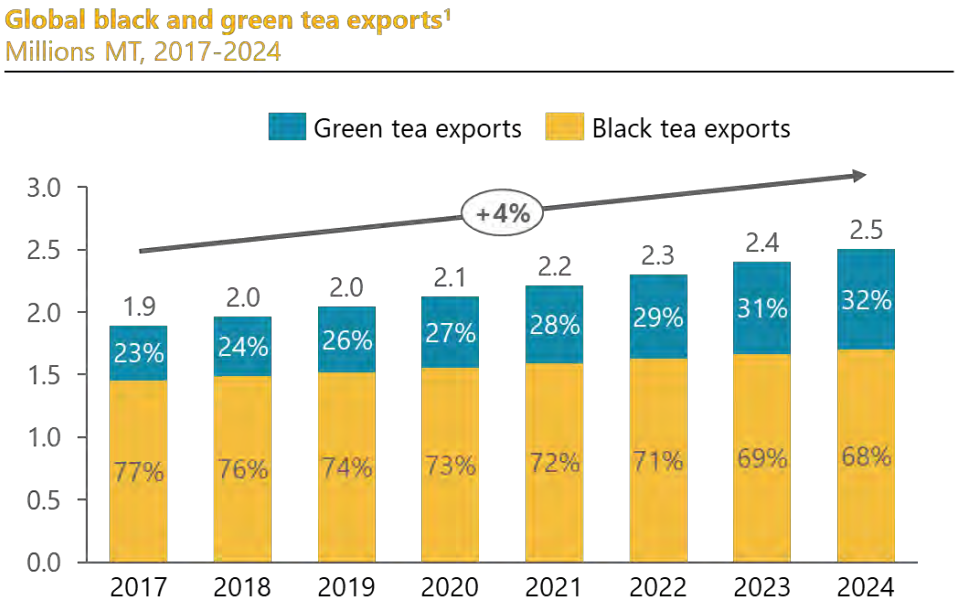
1: The latest available world data is for 2016
Source: NAEB, 2019, NAEB export and reexport values and export destinations 2017-2018; Harvard University, Center for International Development, 2016 ATLAS of economic complexity

Market outlook

The global tea market is projected to grow at a 5.75% CAGR from $49.46 Billion in 2017 to $73.13 Billion in 2024,[34] driven by continued growth in black tea exports, and rising demand for new diversified tea categories. Black tea exports are projected to increase at a 2.23% CAGR from 1.45 million tons in 2017 to 1.70 million tons in 2024,[35] while premium and specialty teas markets are projected to grow even faster. Green tea exports are projected to more than double, growing from 337,300 tons in 2014 to 804,300 tons in 2024.[36] Specialty teas such as white and organic tea are also projected to grow significantly from a current low base, driven by the awareness of their health benefits. The figure below shows the projected growth of black tea (CTC and orthodox combined) and green tea from 2017 to 2024.

[34] Statista, Accessed March 2019, Global tea market size 2017-2024
[35] World Tea Economy, 2016, Trends and Opportunities
[36] Ibid

Figure 41: Forecasted global black and green tea exports



1: Other specialty tea categories are a smaller, but growing share, not included in this graph due to a relatively market nascent segment

Specialty tea is driving higher prices globally, while black tea prices are expected to decline progressively over the next decade, putting pressure on producing countries for increased diversification. Global black tea prices have been increasing over the last decade reaching an average of 3.15 USD/ kg in 2017, up from 2.39 USD/kg in 2008. However, these prices are projected to decline over the next 10 years reaching 3.0 USD/kg in 2027.[37] Meanwhile, the specialty tea market, including green tea, is considered the most profitable segment due to the rise in demand as people become aware of their health benefits.[38] The price differential compared to black tea is 36% for organic tea, 195% for organic green tea and this price differential can be higher for other categories of specialty tea.[39]

In view of the market outlook, Rwanda's tea holds a unique quality, positioning the country to take advantage of market trends. Rwanda possesses unique climatic and soil conditions that allow it to produce quality tea competitively and could leverage this advantage to diversify its production into premium specialty tea categories.

"Rwanda should maintain recognition of its quality tea. Rwanda can grow the best tea in the world" **– International organization**

"Rwanda should consider adding value and packaging tea locally" **– Tea buyer**

Key challenges and value chain needs

To take advantages of the market opportunities in tea, Rwanda must address key challenges in the value chain related to production and productivity, as well as processing and marketing. These challenges are detailed below:

[37] FAO, Committee on Commodity Problems, 2018, Current market situation and medium-term outlook
[38] Allied Market Research, 2019, Tea Market, Global Opportunity Analysis and Industry Forecast 2017-2023
[39] Tea exporter interview, 2019; Dalberg analysis, 2019

Production and productivity

- **Limited farmers' investment into production inputs** – in new tea estate settings, where farmers are not yet recording optimum yields to invest in fertilizer and other production inputs. Little investment into production inputs can delay the number of years to reach maturity from ~15 years to up to 20 years.
- **Limited knowledge in farming best practices** by farmers in young tea estates.
- **The above challenges lead to lower yields:** for mature tea plants – 10MT/ha in average instead of optimum 15 MT/ha; juvenile plants – 5 MT/ha instead of 8 MT/ha; and young tea plants – 1.4MT/ha instead of optimum of 3 MT/ha.[40]
- **Limited R&D capabilities** leading to imports of clones which are not always suitable to grow in Rwanda's climatic conditions.[41]

Processing and marketing

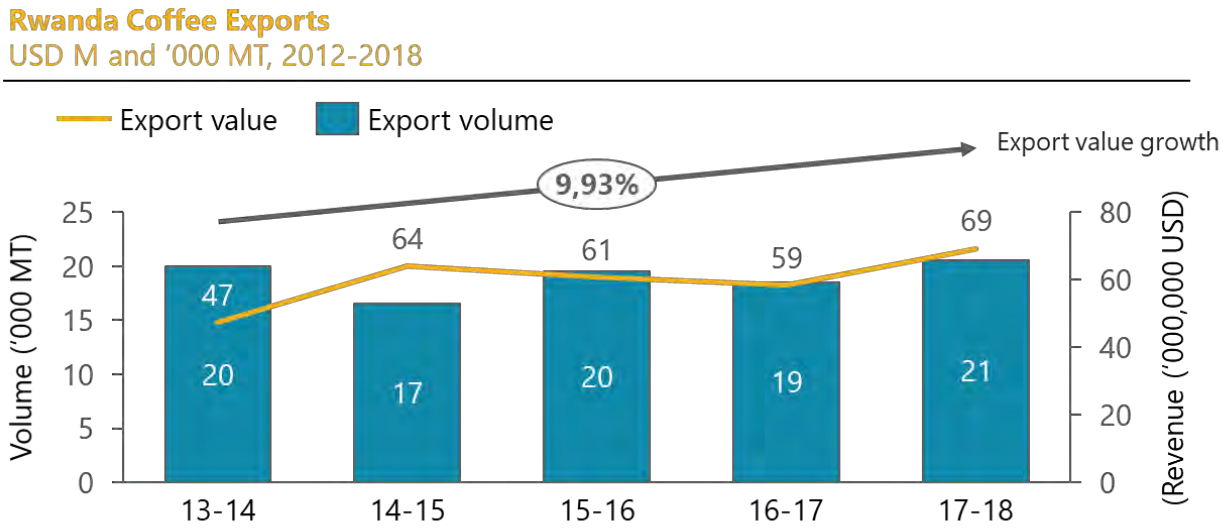
- **Limited knowledge in quality management** across production and processing stages such as timely adequate tea plucking, and processing – especially by young tea factories with limited experience. [42]
- **Limited market information** – to establish direct buyers relationships, and to sell at a higher value.[43]
- **Non-optimum prices fetched for high-quality Rwandan exported tea** – 75% of produced tea is sold through auctions where Rwanda has little control over the grading of its tea, hence fetching lower prices for its high-quality tea than it would if sold through direct buyer relationships.
- **High logistics costs affecting competitivity or marking potential** – given its landlocked nature, Rwanda tea must face additional road transport costs from Rwanda to Kenya, for shipping via Mombasa.

[40] NAEB, Tea division data, Green leaf production per factory and estimative yield
[41] NAEB, 2019, tea division data
[42] NAEB data, 2019
[43] Ibid

Coffee sector performance and outlook

Past export trends

Figure 42: Rwanda coffee exports trends

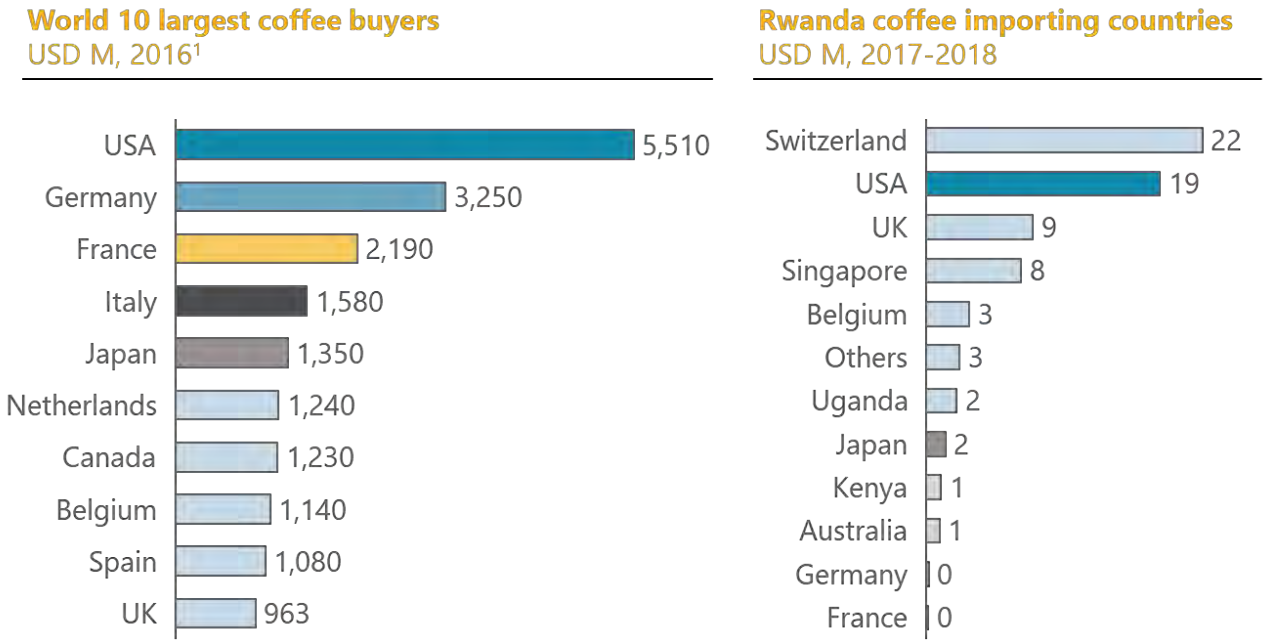


Source: NAEB Annual Reports, 2013/2014-2016/2017; NAEB, 2018 Strategic Business Plan 2019-2024 ,Dalberg analysis, 2019

- **Coffee is one of Rwanda's leading exports crops but witnessed unstable growth over the past decade.** The value of Rwanda's exported coffee remained unstable in the past decade but grew at a 10% CAGR between 2013 and 2018.[44]
- **Rwanda exports most of its coffee as green to the EU and the USA who are among the largest buyers globally.** Rwanda exports over 60% of its coffee to EU, 20% to the USA, and in smaller quantities to Singapore, Belgium, and Uganda to name a few. The five largest buyers of coffee globally are the US, France, Japan, Germany, and Spain. Other buyers include Canada, Netherlands, UK, South Korea, and Russia.[45]

[44]NAEB 2012-2018 annual reports; Dalberg analysis, 2019
[45] Harvard University, Center for International Development, ATLAS of economic complexity

Figure 43: Rwanda coffee importing countries and world largest buyers of coffee



1: The latest available world data is for 2016
Source: NAEB, 2019, NAEB export and reexport values and export destinations 2017-2018; Harvard University, Center for International Development, 2016, ATLAS of economic complexity

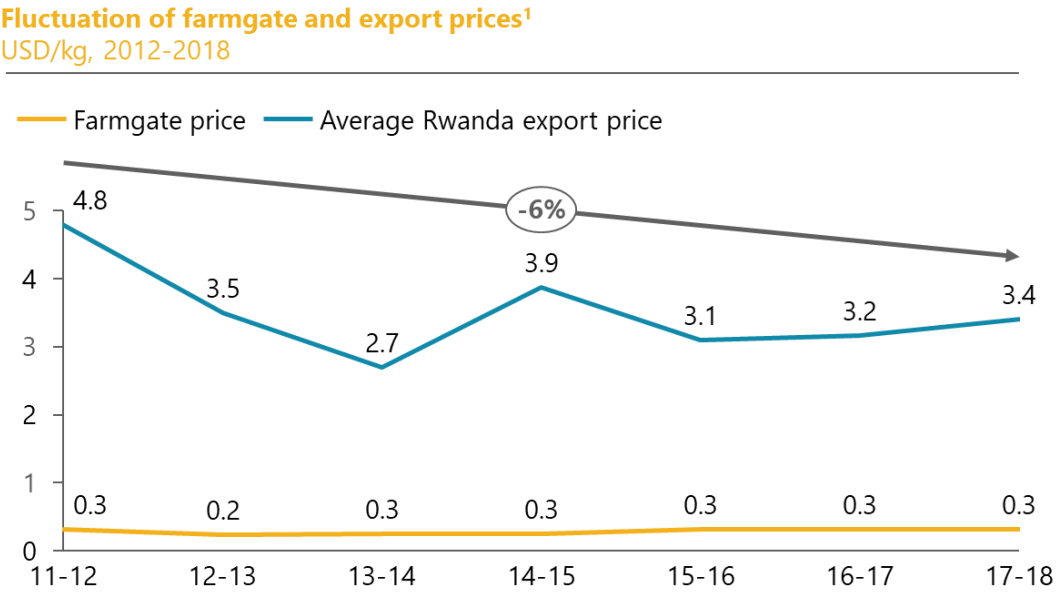
Market outlook

The global coffee market has been marked with a slow growth between 2014 and 2017 at a 1.26% annual rate but is expected to grow faster in the coming years due to rising demand for new diversified coffee categories. Global demand for coffee grew at an annual rate of 1.26% from 2014-2017.[46] This trend is expected to improve in the upcoming five years, with an average annual growth rate of 5.5% between 2019 and 2024 due to the growing market of organic and specialty coffee.[47] The global organic coffee market, for example, is projected to grow at a CAGR of 12.8% from 2,733.2 million USD in 2016 to 4,998.6 million USD in 2021. This growth will be driven by rising health consciousness as organic coffee does not contain any toxic residue of synthetic fertilizers.[48]

Despite growing market demand, and price premium for specialty coffee, the global coffee market is marked by volatile prices, with a downward trend. Global coffee export prices are marked by constant fluctuations, with a recent downward trend, as presented in the figure below. Specialty coffee, however, fetches a price premium on top of the price for conventional coffee. The price premiums for organic coffee as compared to regular coffee differ depending on the quality and origin of the coffee and can increase based on other certifications held by the producers.[49] Specialty coffee from Africa fetched an average of 21% price premium over conventional coffee between 2014 and 2016.[50]

[46] United Nations Conference on Trade and Development (UNCTAD), 2018, State of the Global Coffee Market
[47] Mordor Intelligence, 2018, Global coffee market, Coffee market- Growth, Trends and Forecasts (2019-2024)
[48] Technavio Research, 2017, Global organic coffee market 2017-2021 - Market Analysis and top drivers
[49] FAO, 2009, the market for organic and Fairtrade coffee
[50] 2014-2016 average conventional coffee from Rwanda as compared to 2014-2016 specialty coffee price from Africa as found in Transparent Trade Coffee, 2017, From transparency reports to a potential transaction guide for specialty coffee purchases, 2017

Figure 44: Fluctuation of coffee export prices



1: Average Rwanda export prices reflect the average sales price recorded by Rwanda for different quality categories of coffee exported, due to currency conversions, there may be a small price difference with actual export prices. However, these values reflect the actual fluctuation of coffee prices in the recent years
Source: NAEB Annual Reports, 2013/2014-2016/2017; NAEB, 2018 Strategic Business Plan 2019-2024 , NAEB, 2019, Arabica farmgate prices evolution, 2005-2019; Dalberg analysis, 2019

Key challenges and value chain needs

To better capture opportunities in coffee exports, Rwanda must address key challenges in the value chain related to production and productivity, quality, as well as diversification into higher value coffee. These challenges are detailed below:

Production and productivity

- **Scattered farmer production areas** with low yields (0.5-0.6 MT/ha) and inefficient value chain coordination, leading to higher logistics and production costs for smallholders who often complain of little or no margins. These challenges are reinforced by the aging farming population with limited implication of younger farmers which may threaten future
- **Aging trees –** 25.8% of coffee trees are above 30 years old.[51] This also contributes to low yields in the coffee sector
- **Low quality of harvested cherries**- Only 64% of total production was fully washed coffee of high quality in 2018.[52] The rest of the cherries which were of lower quality were mostly sold on the local market at lower prices

Processing and marketing

- **Inefficient utilization of coffee washing stations (CWSs) due to poor managerial practices at CWSs among others** – In 2018 coffee washing stations utilized an average of 84 % of their capacity.[53] This reduces the exporter margin on coffee.

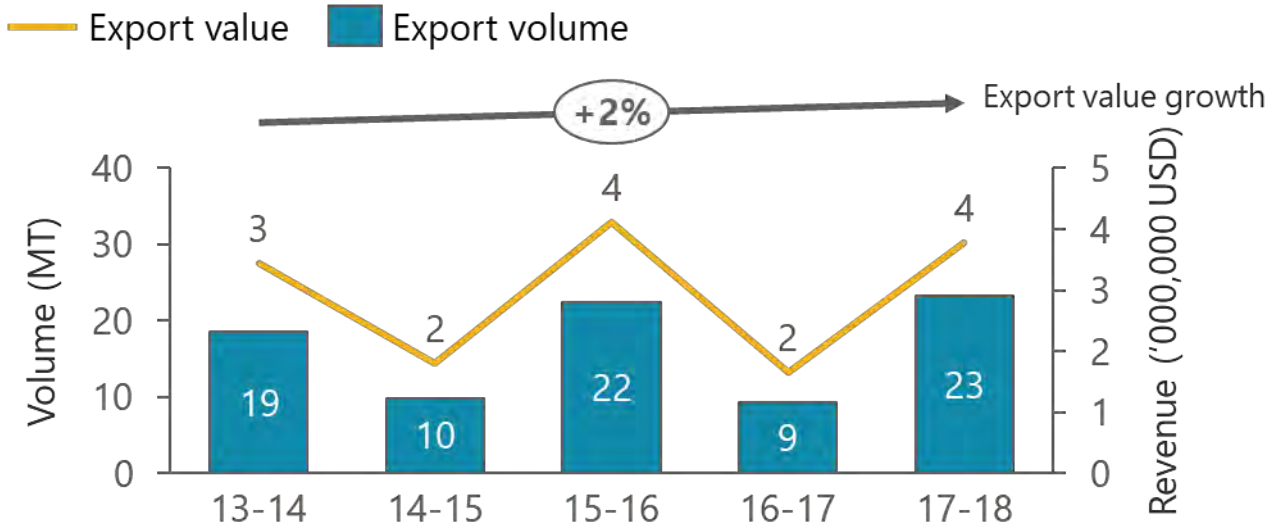
[51] NAEB, 2015, Coffee census
[52] NAEB, 2017, 2016-2017 Report
[53] NAEB, 2019, Coffee division data

- **Limited diversification into specialty/higher value coffee:** 97% of coffee exported from Rwanda is green coffee, with limited diversification into specialty or single origin coffee.

Pyrethrum sector performance and outlook

Past trends

Figure 45: Rwanda pyrethrum export trends



Source: NAEB annual exports data 2013 - 2018; NAEB website, Pyrethrum, Accessed March 2019; Dalberg Analysis, 2019

- **Rwanda pyrethrum exports fluctuated over the past five years**, due to the limited market for pyrethrum extract[54] leading to selling only a portion of the production. Despite low volumes exported from Rwanda, Rwanda is the second world producer after Australia.
- **Rwanda diversified its exports markets in 2017-2018** beyond the US, to cover the EU and Asia. European countries include Spain, Italy, and Germany while Asian countries include China, South Korea and the UAE.[55]
- **Rwanda primarily produces pyrethrum extracts – with one single pyrethrum processor** (SOPYRWA) in the country dominating the sector

Market outlook

The global pyrethrum market is projected to grow from a low base, at a CAGR of 6.4% between 2017 and 2026,[56] led by rising demand both for natural insect repellent products and organic pesticides in agriculture.[57] Rising demand for insect repellent products (expected to reach 3.7 billion USD by 2026)[58] and organic pesticides in agriculture (projected to increase at a 15.9% annual rate from 99.2 million USD in 2016 to 279.2 million USD in 2023)[59] is driving global exports of pyrethroids (synthetic product similar to pyrethrin) and pyrethrin (pyrethrum extract) products. Pyrethroids dominate the pesticide market, with pyrethrin global market growing from a very low base. As the second largest exporter of pyrethrum extract after Australia, and with ~15% of globally exported pyrethrum

[54] NAEB Annual Report 2016-2017
[55] NAEB, 2019, July 2018 – March 2019 pyrethrum refined and crude extract exports value, volume and destination countries
[56] Research and markets, 2018, Pyrethrin – Global Market Outlook (2017-2026)
[57] Coherent market insights, 2019, Pyrethroids Market Worldwide: Latest Industry Trades, Supply, Demand, Future prospects by 2026
[58] Transparency market research, Flies Repellent Market to Touch US$ 3,724.5 Mn by 2026; Demand for Green Products on the Rise
[59] Allied Market Research, 2018, Global organic pesticides market expected to reach $279,195 million by 2023

extract,[60] Rwanda exported just ~4 million USD worth of pyrethrum in 2017-2018. However, pyrethrum extract is witnessing increasing demand given its biodegradable nature and minimal impact on human health and environment and is expected to grow at a CAGR of 6.4% between 2017 and 2026.[61] North America is the largest import market given a high concentration of industries in the sector in this region, but the Asia Pacific will witness the fastest growing demand over the upcoming years – due to increasing population and a growing industrial belt in the region.

Pyrethrum prices have fluctuated over the past years, affecting export revenues, but are expected to stabilize with current market diversification beyond North America.[62] Rwanda's exports fluctuation in past years were partly due to fluctuating market prices, going as low as 162. USD/kg in 2017, down from 300 USD/kg in 2012. However, Rwanda's total exports and exports prices are expected to grow again given market diversification efforts beyond north America, to cover Asia and the EU at more attractive prices.[63]

Global demand trends coupled with Rwanda's natural advantages present opportunities for pyrethrum value addition to export ready-to-use pesticides regionally and internationally and circumventing price fluctuations. Rwanda possesses volcanic soils, high altitudes, low temperature, and a good distribution of rainfall favorable for competitive production of pyrethrum. Ability to intercrop pyrethrum with staple crops such as Irish potatoes, serving as a natural and harmless fertilizer also presents a good incentive for farmers to actively be involved in growing pyrethrum, hence contributing to increased exports. Rwanda has traditionally exported crude pyrethrum extract but recently diversified into the processing of insecticides and organic pesticides. Rwanda can leverage its natural production advantages regionally and internationally to increase value addition efforts to produce organic pesticides that not only serves the growth of organic production locally, but also serves exports of such products to the east African region and beyond.

Key challenges and value chain needs

To take advantage of the market opportunities in pyrethrum, Rwanda must overcome pertaining challenges related to production and productivity and market linkages. These challenges are detailed below.

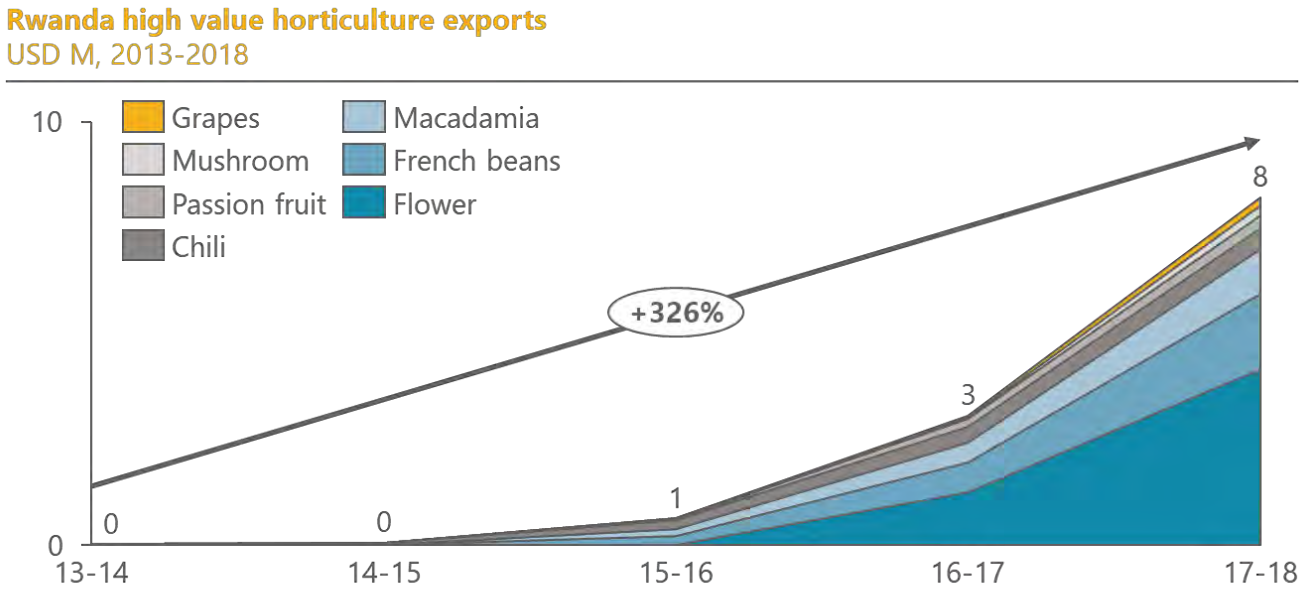
- **Limited suitable land** for production expansion. Pyrethrum plants require 6-12 degrees Celsius at night for quality pyrethrum flower development,[64] temperatures which can be obtained only in some areas of the Northern province, with competition over land for food crops and tourism activities
- **Low productivity** (yield of 0.5MT/ha compared to the optimum yield of 1 MT/ha), due to limited use of fertilizers and knowledge of best practices by farmers
- **Market diversification:** Pyrethrum processors do not have sufficiently established and diversified market linkages and products. This limits their opportunity to sell at a higher value

[60] NAEB, 2019, Diversification division data
[61] Research and markets, 2018, Pyrethrin – Global Market Outlook (2017-2026)
[62] NAEB, 2019, Diversification division data
[63] Ibid
[64] Brown P.H., Menary R.C., 1994, Flowering in pyrethrum (Tanacetum cinerariaefolium L.). I. Environmental requirements

Horticulture sector performance and outlook

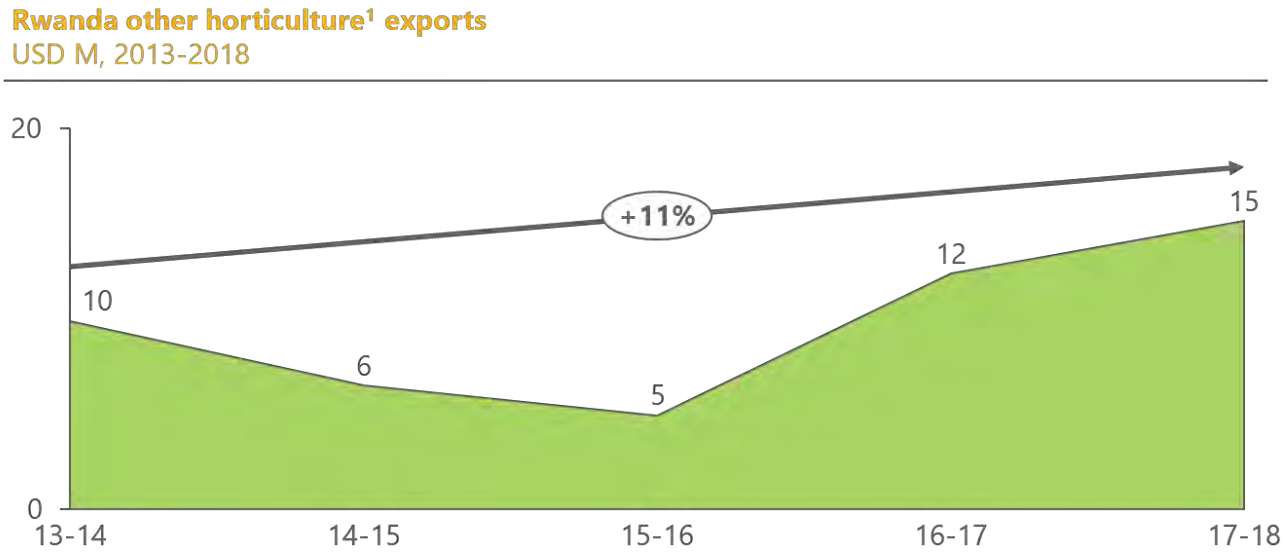
Past export trends

Figure 46: Rwanda high value horticulture export value



Source: Dalberg analysis, 2019; NAEB, NISR, 2017, Statistical Yearbook; NAEB, 2018, NAEB formal and informal export, 2017-2018

Figure 47: Rwanda other horticulture export value



Source: Dalberg analysis, 2019; NAEB, NISR, 2017, Statistical Yearbook; NAEB, 2018, NAEB formal and informal export, 2017-2018
1 Other horticulture: The rest of the horticulture sector including but not limited to fresh beans, cabbage, onion, tomato, eggplant, green vegetables, sweet banana, pineapple, and avocado

- **Horticulture exports grew rapidly** from $10 million in 2013-14 to $23 million in 2017-18, at a compounded annual growth rate of 18%.
- **Exports of high-value crops** such as cut flowers, French beans, macadamia, chilies, passion fruits, mushrooms, and grapes have grown faster than others, at a compound annual growth rate of 326%. This growth can be attributed to increased investments and coordination from

NAEB in cold chain infrastructure, coupled with air freight capacity via RwandAir, which led to an increasing number of horticulture export companies in Rwanda.

- **Other horticulture crops, which still account for 65% of the entire horticulture export**, are exported in large volumes but at lower prices, and grew by 11% each year during the same period.
- **NAEB has made or facilitated investments in some of the high-value crops and extension services, supporting the rapidly growing horticulture exports.** Such initiatives include Gashora Farm, Gishali Flower Park, Nyacyonga Flower Farm, Muyumbu Macadamia Nursery, and the NAEB packhouse and cold chain logistics.

Market outlook

The global market for fresh fruits and vegetables is projected to growth at 6% annually, reaching $4.8 trillion Euros, led by demand from Asia, Oceania, and the EU respectively. Global imports of fresh fruits and vegetables have globally shown a year on year growth of 5% between 2010 and 2016, and their total value estimated to be $150 billion in 2016.[65] Consumer spending on fruits and vegetables is projected to reach €4.8 trillion by 2030, growing at a CAGR of 6%.[66] Asia and Oceania are the largest (56% of global demand) and also the fastest growing (CAGR of 7%) segment of the global market, followed by Europe (16% of global demand, at 3% CAGR) and the Middle East and Africa region (13% of global demand, at 5% CAGR).[67]

High and growing prices for high-quality fresh fruits and vegetables, especially organic products, in international markets suggest a high revenue potential for both Rwandan farmers and exporters. The average farmgate price for horticulture products per hectare is more than ten times greater than those for staple crops,[68] and margins for exports to Europe are higher than margins for regional exports, for the same crop. The market for organic produce – especially for vegetables within the EU – grew at a CAGR of 12% between 2006 and 2016, reaching €30.7 billion in retail sales in 2016.[69] Organic fruits and vegetables can fetch a price premium of 20-40%. However, complying with organic standards in Europe may be costly and difficult given that the requirements are designed for the EU context that is different from the socio-economic and geographical conditions that small organic producers face in developing countries.[70]

Majority of Rwanda's horticulture exports were regional; however, most of high-value horticulture exports were internationally oriented. DRC is the largest importer of Rwanda's fresh fruits (75.2%) and vegetables (69.1%). However, most of the flowers, French beans, chilies, and passion fruits exports went to Europe, while macadamia was largely exported to Vietnam.

Given Rwanda's natural constraints of small land size and being landlocked, it should strategically focus on exporting high value horticulture crops that are highly profitable, agronomically viable, and are relatively free from those structural or natural challenges. Among the high value crops that are highly demanded in the EU and other international markets, perishable and low weight crops (e.g., French beans, passion fruits, etc.) can bring the most export earning potential for Rwanda. High value

[65] FAOSTAT 2016 data
[66] Fruit Logistica, 2018, Trend Report : Disruption in fruit and vegetable distribution
[67] Fruit Logistica, 2018, Trend Report : Disruption in fruit and vegetable distribution
[68] Dalberg analysis, 2018 ; Farmer annual income per crop: Maize $297/ha, chili $4,336/ha, snow peas $4,588/ha, passion fruits $4,985/ha
[69] Research Institute of Organic Agriculture (FiBL), 2019
[70] CBI, Which trends offer opportunities on the European fresh fruit and vegetables market?

but high weight (e.g., avocado) or low value and high weight (e.g., tomatoes) fruits and vegetables can focus on targeting the local or regional markets where they can be shipped by ground transport. The figure below illustrates a number of high value horticulture value chains that have been prioritized for international market exports based on assessments of their agronomic viability, profitability, competitiveness, and social impact (how much can farmers earn):[71]

Figure 48: Commercial opportunities in horticulture value chains

Value chain	Viability	Summary
French Beans	Viable	Highly demanded in Europe at high prices, offering farmers earnings of $7,000 per HA
Snow Peas	Viable	Cost structure is globally competitive and farmers earn as much as $4,100 per HA when exported to Europe
Passion Fruit	Viable	High margins and high yields make passion fruit a lucrative value chain, offering farmers $5,000 per HA
Chili	Viable	Chilis can provide farmers a $4,500 income, and technical certifications could become a competitive advantage
Mushroom	Viable (specialty mushrooms)	Common mushrooms represent thin margins, however specialty mushrooms offer 80% margins
Macadamia	Viable, but too long return horizon	Intercropping with coffee offers a 27% IRR, but 10 year payback is unrealistic for commercial investment
Avocado	Deal breaker – Cost of shipping	Avocados are heavy and transported via sea freight and ripened onsite in Europe. Rwanda would need to ship avos from Kenyan and Tanzania ports, which already grow and export their own avos at lower production prices
Pineapple	Deal breaker – Cost of shipping & low yiel	Competitors (Ghana, Costa Rica) are shipping via sea, whereas Rwanda would have to first ship to a port for onward shipment, which cannot be done at significant cost savings. Further, disease leads to low yields in Rwanda

Source: Dalberg, 2018, USAID/ISP Rwanda Value Chain Study
Note: Cut flower was not part of this study despite high value in Europe

Rwanda is well positioned to produce some of the high-value horticulture crops which are in high demand in Europe due to its favorable climatic and agronomic conditions and low labor costs. Horticulture crops have limited growing conditions in Europe, especially during the winter season. Low labor costs allow Rwanda to be cost competitive in producing technical and labor-intensive crops such as cut flowers (roses), French beans, snow peas, chilies, and passion fruits.

Key challenges and value chain needs

Key challenges of the horticulture sector span across production and productivity, quality management, logistics capacity, and market linkage. Inconsistencies in quantity and quality of products resulting from the first three needs are causing difficulties to Rwandan exporters in finding long-term business relationships with buyers in international markets who demand regular shipments.

[71] Dalberg, 2018, USAID/ISP Rwanda Value Chain

Production and productivity

- **Limited access to quality inputs –** Out-grower farmers lack quality input financing, most of which are imported and costly. This leads to crops' high vulnerability to pests and diseases and lower yields.
- **Limited technical agronomic know-how –** Farmers need to build agronomic knowledge and skills to get the best yields of some of the highly technical high-value crops such as snow peas and French beans, given the relative nascency of the sector.

Quality management

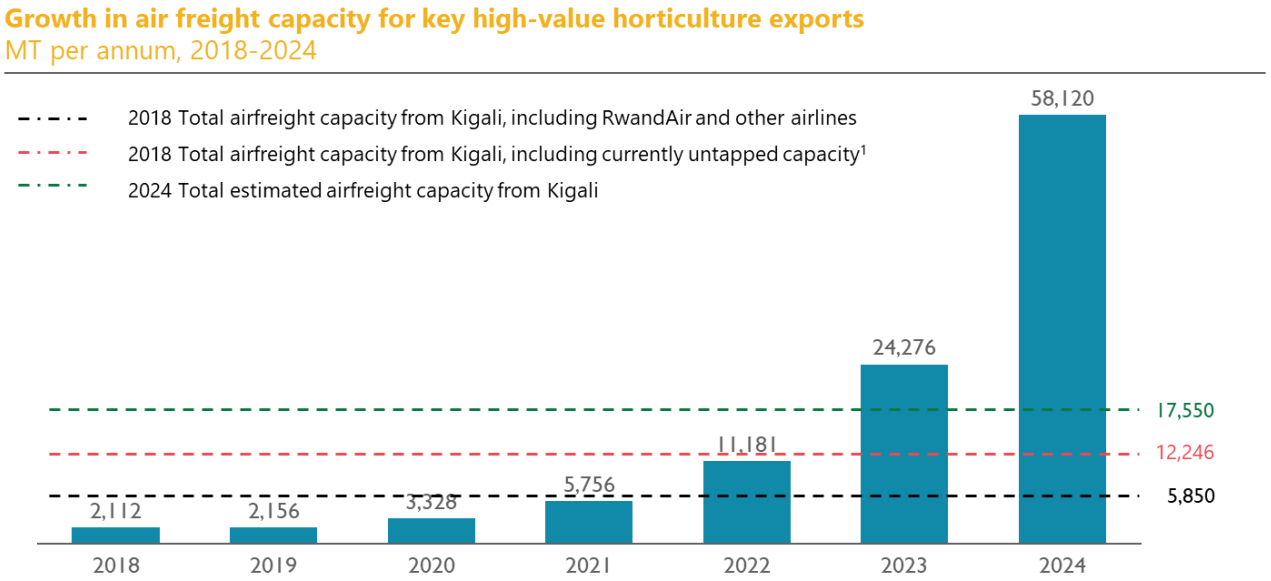
- **Limited post-harvest handling knowledge and skills –** Currently reject levels of fresh horticulture produce such as French beans are as high as 30-40% of production on out-grower farms due to limited post-harvest handling capabilities and equipment, higher than the industrial average of 10-15%.[72]
- **Compliance with quality and safety standards requirements –** The EU, which is the largest market for high-value horticulture crops, has strict regulations around the maximum residue levels (MRLs) for pesticides, maximum levels for certain contaminants, and plant health (sanitary and phytosanitary – SPS) issues. While horticulture commodities fetch higher prices in the EU than in other places, the investments required for Rwandan products to comply with the EU requirements are also substantial.

Logistics capacity

- **Limited cold chain logistics capacity –** the Export volume of produce that requires cold storage reached 55MT per week in 2018 during peak seasons. These volumes are soon expected to exceed the current capacity of the NAEB shared packhouse (32MT at a time) and the cold room at the Kigali International Airport (10MT at a time), given the continued growth of export volumes.[73] Horticulture exporters share only one NAEB cold truck, resulting in delays in delivery to the airport, challenges with coordinating schedules and crowding of the airport cold room facilities. Few successful mid-stage exporters have recently started invested in cold rooms and cold trucks themselves as a result; however, most early-stage and small-scale exporters do not have sufficient financial means to afford them, nor do they produce enough to fully utilize the cold chain facilities themselves.

[72] Stakeholder interview, 2018
[73] Stakeholder interviews, 2019

Figure 49: Air freight capacity growth projection



Source: Dalberg analysis, 2019; Rwanda Revenue Authority, RwandAir, NAEB
1: Currently untapped capacity refers to air cargo space currently available but not utilized for freighting horticulture products, by different aircraft operators

- **Limited air freight capacity** – Airfreight capacity is the primary limiting factor of how much volume of crops Rwanda can export in the future. Rwandan exporters have been able to take advantage of the discounted air freight rate offered by RwandAir. However, the weekly export volume (55MT) has already exceeded the current RwandAir air cargo capacity to the EU (30MT per week) and the Middle East (21MT per week). Air cargo space is available on other airlines such as KLM, SN Brussels, and Turkish Airlines that fly out of Kigali to the international market destinations, however at higher prices than what RwandAir currently provide. Even when all the cargo space of untapped flight routes or airlines are combined, the horticulture export volume that requires air freight is soon expected to exceed the capacity.
- To attract commercial air freighters to stop in Kigali, a more competitive rate should become available.

Limited private sector investment

- **Limited number of sizeable horticulture exporters** – Of 17 horticulture exporters that were able to make air freight shipments to international markets in 2017, only eight of them have constantly remained in business; Most of them had an annual revenue of less than $1 million in 2018.[74]

Market linkage

- **Limited marketing capabilities** – Early stage horticulture exporters do not have sufficient market information and marketing capabilities to find and establish business relationships with buyers.

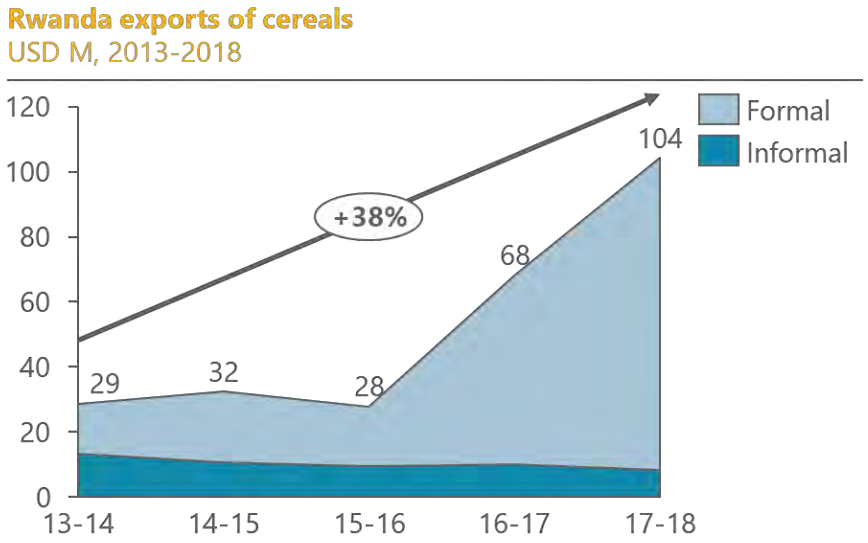
[74] Except for Bella Flowers, a state-owned company with 100% shares from NAEB, with annual sales of ~2million USD

Cereals sector performance and outlook

Past trends

Cereals exports have increased sharply since 2015-2016 from $28 million to $104 million in 2017-2018 at a CAGR of 38%, largely due to the entrance of industrial cereals processors into Rwanda. In 2017-2018 cereals accounted for 20% of the total agricultural exports, making it the second largest exported agricultural sub-sector category next to animal products.

Figure 50: Rwanda exports of cereals and composition

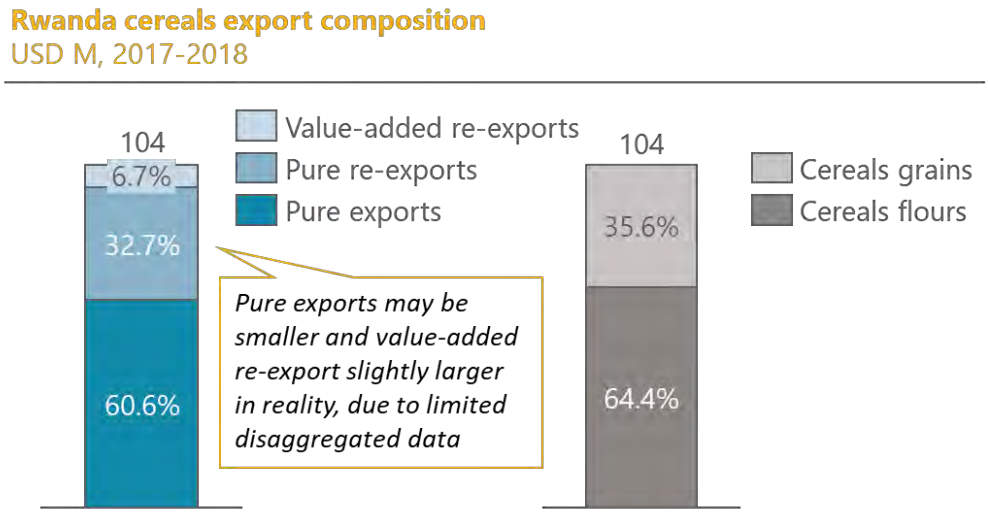


Source: NAEB, 2018, Strategic Business Plan 2019-2024; NAEB, Export and re-export values and export destinations 2017-2018

Source: NAEB, 2018, Strategic Business Plan 2019-2024; NAEB, Export and re-export values and export destinations 2017-2018

However, the majority of Rwanda's cereal exports are re-exports, with a small portion (6.4%) of value-added re-exports as cereals flours, the majority of which is exported to DRC.

Figure 51: Composition of Rwanda cereals exports



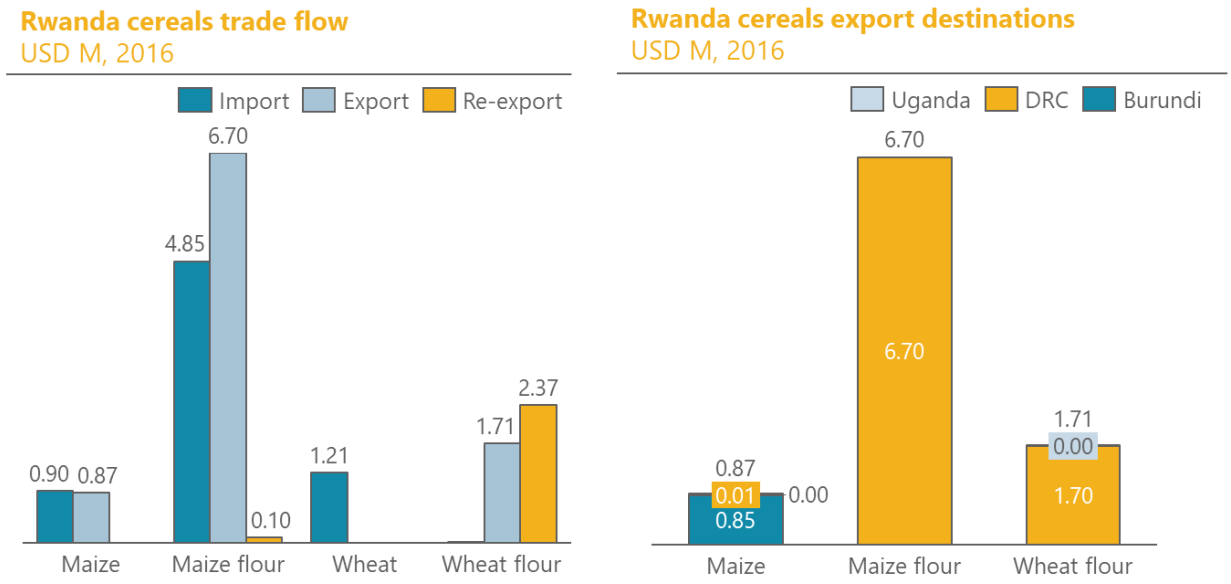
Source: Dalberg analysis, 2019; NAEB, 2018, Formal and informal export 2017-2018; NAEB, 2018, Export and re-export values and export destinations

Rwanda's cereals exports can be classified as the following:[75]

- **Pure exports (60.6%)**: Grains produced in Rwanda and exported as grains, or grains produced and milled in Rwanda and exported as flours – e.g., maize flour milled in Rwanda using locally produced maize
- **Pure re-exports (32.7%)**: Products produced and/or processed in other countries that were imported by Rwanda and exported to other countries without Rwanda's value addition – e.g., broken rice, biscuits, spaghetti, etc.
- **Value-added re-exports (6.7%)**: Grains imported from other countries, milled in Rwanda, and exported as flours – e.g., wheat and maize flour milled in Rwanda using imported wheat and maize grains

Milled products accounted for 64.4% of Rwanda's total cereals exports, most of which went to DRC accounting for over 50% of DRC's cereal flours imports.[76] Most of the maize flours exported are those that have been milled in Rwanda (pure exports and value-added re-exports) while wheat flours exports consist of both those milled in and outside Rwanda (pure re-exports and value-added re-exports). Most of the unprocessed maize went to Burundi.

Figure 52: Rwanda cereals trade flow and export destinations



Source: UN COMTRADE data

Market outlook

The regional market for milled cereals is limited outside DRC, the major buyer in Eastern Africa and Rwanda's limited production potential limits its ability to compete with other regional players. The domestic market for maize is projected to grow with the 2.5% annual population growth and the importance of maize as an affordable, nutritious, and traditional staple crop. Being able to produce for local consumption can be an opportunity for import substitution. However, Rwanda has limited competitiveness against other cereals exporting countries who are able to produce with higher cost

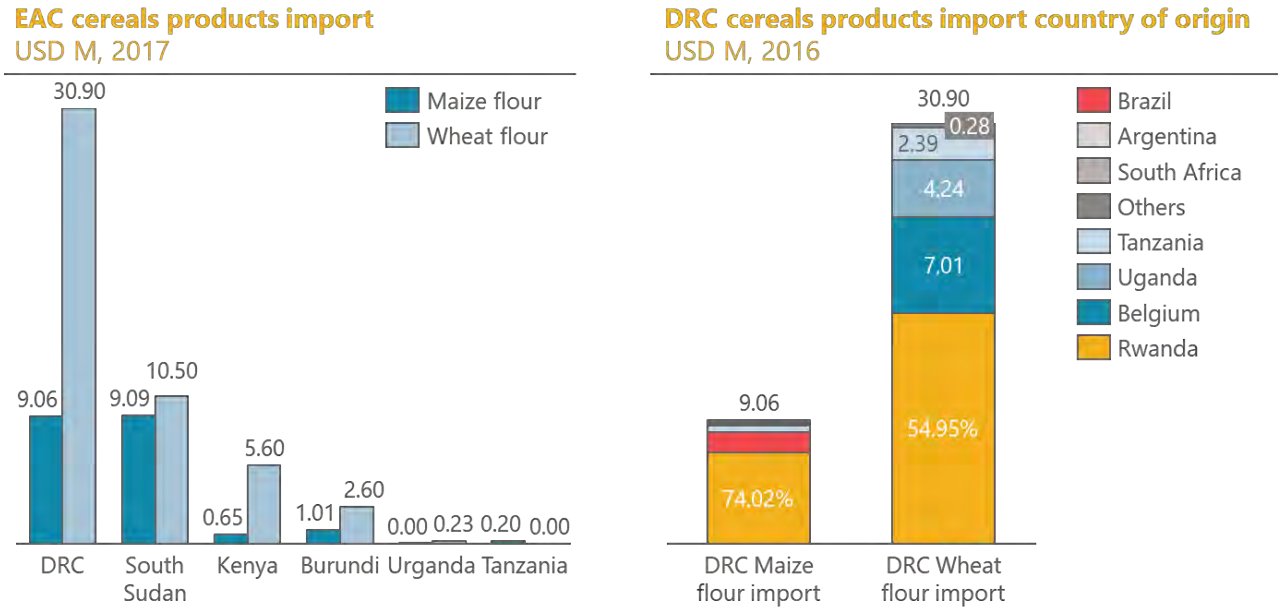
[75] NAEB export data, 2018 ; Pure exports may include value-added re-exports to certain extent, however tracking the countries of origin for cereal flours milled in Rwanda is difficult. Industrial maize flour processors in Rwanda source 40-60% of maize grains from local farmers.

[76] NAEB, 2018, Formal and informal exports 2017-2018 ; UN COMTRADE data

efficiency such as Uganda and Zambia, which produce at higher yields, double of current Rwanda yields of 1.1 – 1.5 MT/ha.[77]

Given the limited regional demand for milled cereals (40 M USD in 2017) and Rwanda's limited capacity to produce cereals at scale, Rwanda can increase cereals exports revenue by focusing on value-added re-exports. Value-added re-exports include both milling and/or packaging maize flour before exports. A few industrial maize flour processors based in Rwanda such as Africa Improved Foods and Minimex have been able to tap into the regional demand for refugee camps and population under malnourishment through institutional sales to international organizations (e.g., WFP and UNICEF), NGOs, and local governments: As shown in the figure below (left), the import demand for cereals flours by DRC and South Sudan is likely to remain important in the six five years as these countries are likely to remain largely politically unstable.

Figure 53: Processed cereals imports in EAC and countries of origin for DRC's processed cereals imports



Source: UN COMTRADE data

Key challenges and value chain needs

Rwanda maize farming consists of smallholder farmers and is characterized by low productivity due to lack of agronomic and technical know-how. Rwandan farmers have an average land plot size of 0.5 - 1acre dedicated to maize farming,[78] and their average yield is between 1.1 MT/ha and 1.5 MT/ha,[79] much lower than 2.2-2.5 MT/ha of Uganda, and the optimum yield for maize of 10 MT/ha.[80] Farmers also lack post-harvest infrastructure and knowledge of quality management practices, which lead to high moisture content, above the ISO-recommended level of 13.5%[81], which affect processors' ability to source raw maize.

The average moisture level of maize on the market is 20-23%, above the recommended levels. Due to moisture content issues, when sourcing for maize, we have to reject up to 20% of our supply at

[77] FAOSTAT, 2019
[78] NISR, 2018, Seasonal Agricultural Survey 2017
[79] NISR, 2018, Seasonal Agricultural Survey 2018
[80] FAOSTAT, 2019
[81] International Organization for Standardization, 2016, ISO 712:2009

the beginning of the season; two months into the season, the rejection rate can get as high at 80%. – Maize processor

Cereals processors in Rwanda are well-positioned to serve the regional market, equipped with milling facilities capable of processing over 30,000 MT per annum, a sufficient volume to meet a significant share of the regional demand. However, they are challenged by the low quality of local maize and therefore import over 40% of maize grains, mostly from Uganda.[82] Rwanda's cereals production and processing need support in the two following areas:

Production and productivity

- **Infeasibility of mass production –** Small land plot sizes and steep slopes make mechanized farming difficult, resulting in Rwanda's limited competitiveness over regional players who are able to produce maize much more efficiently (e.g., Uganda, Tanzania, Zambia, etc.).
- **Low productivity –** Farmers have insufficient farming skills and knowledge, and resources to produce at higher yields. Limited irrigation, pests and diseases, declining soil fertility, and low-quality seeds result in low yields.

Quality management

- **Limited post-harvest handling knowledge and capacity –** Farmers have insufficient skills, knowledge, and equipment to dry cereals quickly after harvesting. This results in higher moisture content, leading to aflatoxin contamination issues and high rejection rates by industrial millers (20% rejects; 80% rejects after 2 months into the season).
- **Limited quality and safety standards enforcement –** 95% of cereals traded in Rwanda are informal, allowing for low-quality cereals to be traded at lower prices by farmers.

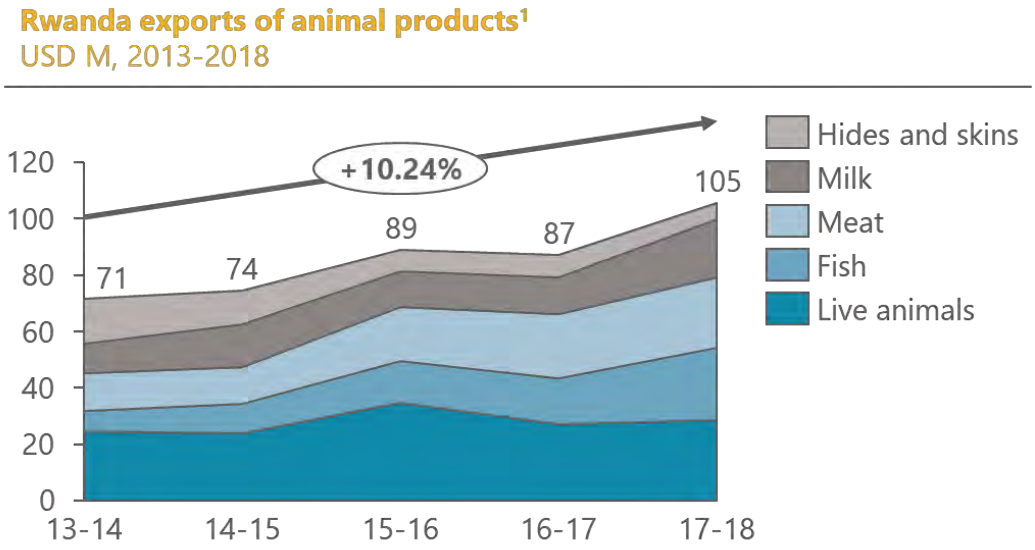
[82] Stakeholder interviews, 2019

Animal products sector performance and outlook

Past trends

Animal products grew at a CAGR of 11.15% in the past 5 years and accounted for the largest sub-sector the agriculture exports (23%) in 2017-18. Live animals were the largest component of the animal products exports, but fish and milk were the main drivers of growth at CAGR of 28% and 15% respectively, between 2013-14 and 2017-18.

Figure 54: Rwanda exports of animal products

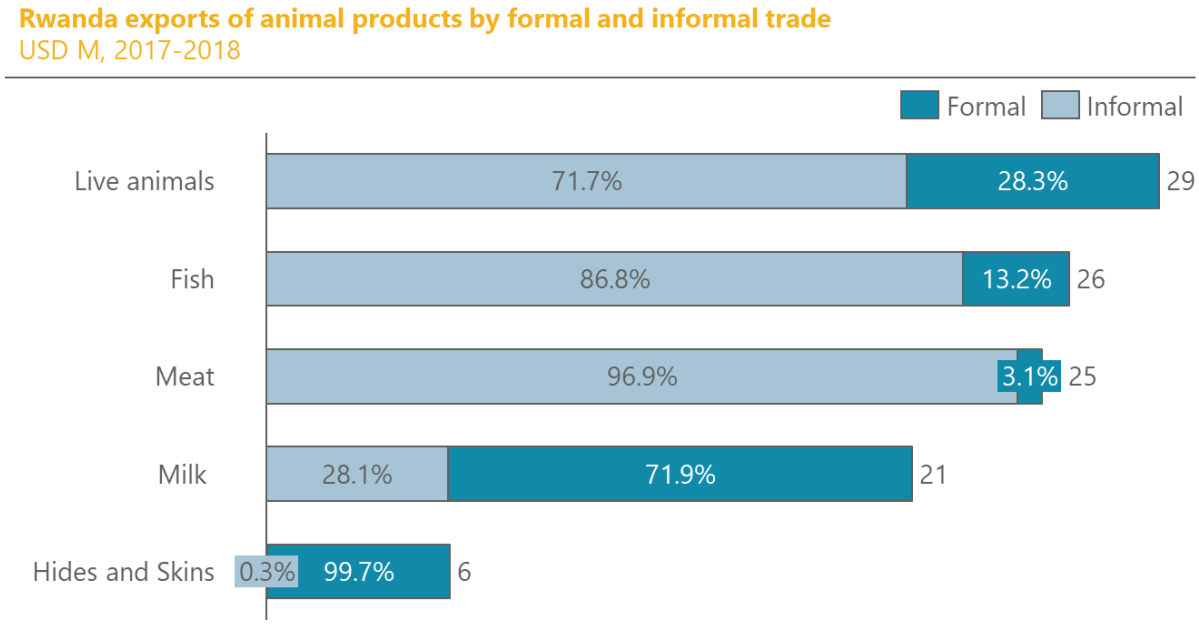


Source: Dalberg analysis, 2019; NISR, 2017, Statistical Yearbook; NAEB, 2018, Formal and informal export 2017-2018
1: The figures for animal products in the above graph may differ from the total export value of animal products as yearly export value data for eggs were not available and therefore excluded from this graph

This growth can be explained by a set of challenges that rose in DRC in recent years, as reflected in the large value of informally traded goods in the animal products category (69%), and their concentration towards DRC.[83] Of the formal trade, DRC was still the largest buyer of Rwandan live animals, fish, and milk.

[83] The informal trade figures, provided by NAEB, are not captured by the export destinations and trade flow graphics

Figure 55: Rwanda exports of animal products by formal and informal trade

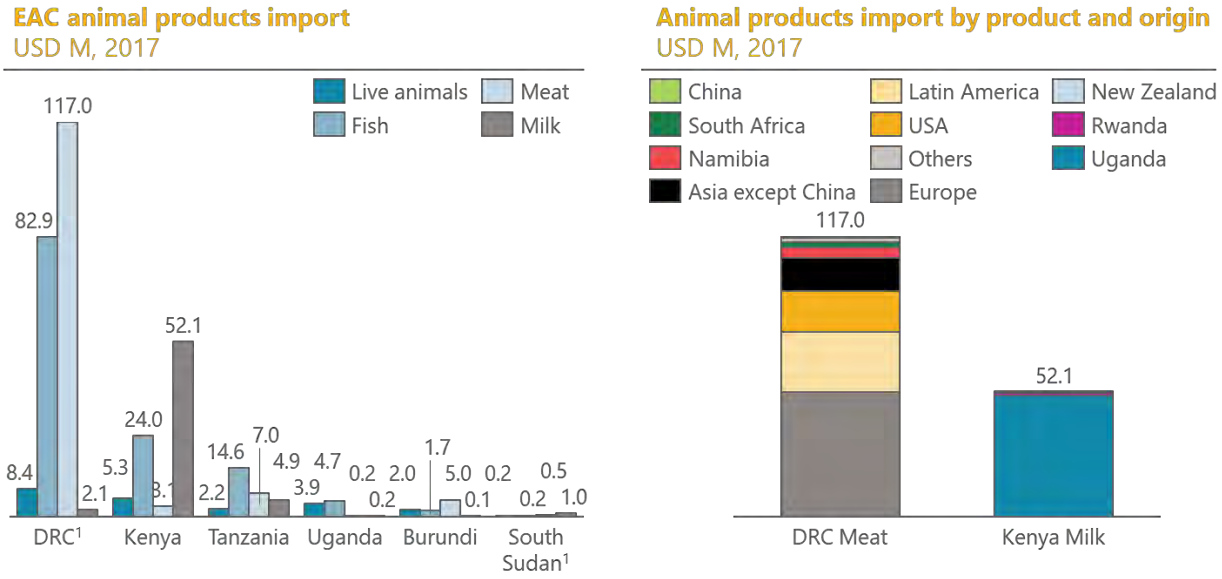


Source: Dalberg analysis, 2019; NAEB, 2018, Formal and informal export 2017-2018

Market outlook

Meat, fish, and milk have high regional demand, DRC and Kenya being the largest importers of these animal products. DRC's meat imports reached $117 million and fish imports reached $83 million in 2017, while Kenya imported milk worth of $52 million and fish worth of $24 million.[84]

Figure 56: Animal products imports in EAC and countries of origin



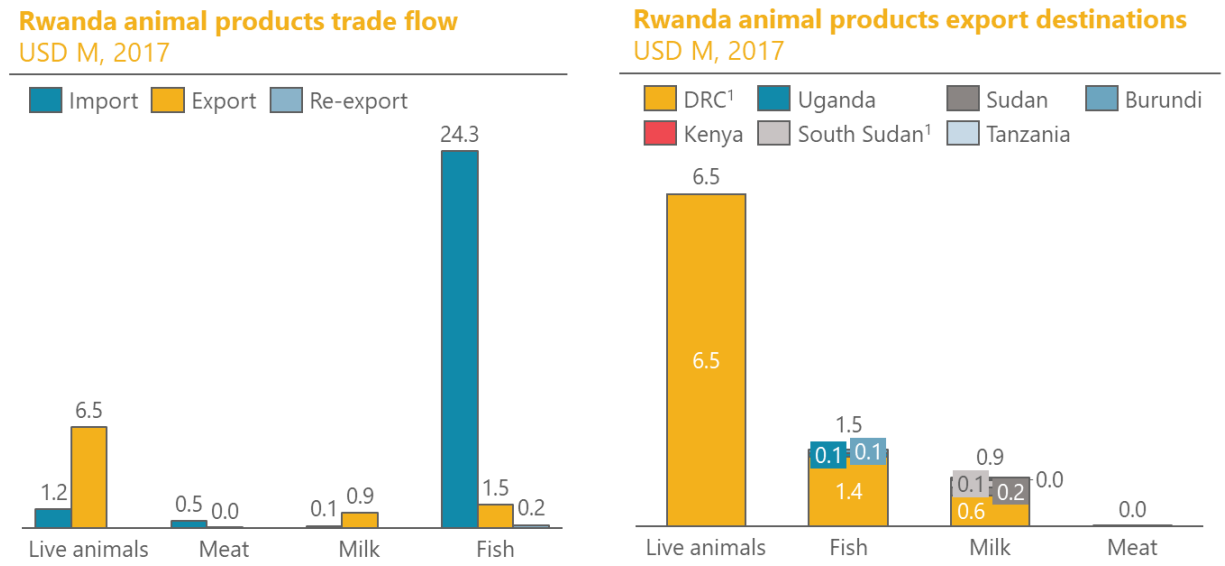
Source: UN COMTRADE data
1: DRC and South Sudan used 2016 data

However, Rwanda has limited competitiveness in regionally supplying animal products, and the regional demand for Rwanda's animal products, on which current exports heavily rely, is likely to be

[84] UN COMTRADE data ; Due to the largely informal nature of the trades between Rwanda and DRC, Rwanda's meat exports to DRC were not captured in the UN COMTRADE data.

lower and less stable in the long term. Rwanda is a net exporter of live animals and milk only but is a net importer of fish. Meanwhile, most fish imported to Kenya and Tanzania come from Asia (China, South Korea, and Vietnam) at much lower prices, making it difficult for Rwanda to compete on the regional market. In addition, limited local access to fish feed is a challenge that further after affects Rwanda's competitiveness. While large dairy processors in Rwanda already export to DRC, Burundi, Uganda, South Sudan, and Tanzania, the dairy sector as a whole has a lower productivity compared to other exporters in the region: Rwanda produces about 2 million liters of milk per day,[85] which is much lower compared to Uganda's much larger dairy industry with 4.5-6 million liters produced per day and which dominates over 95% of the largest regional market for milk imports (Kenya).[86]

Figure 57: Rwanda animal products trade flow and exports by destinations



Source: UN COMTRADE data
1: DRC and South Sudan used 2016 data

The government of Rwanda has led several initiatives to improve production and productivity in livestock, such as:

- **Gako integrated beef project,** co-managed by MINAGRI and MINDEF, aimed to increase quality meat production for both local and export markets, on 5,000 hectares of land in Bugesera and with a slaughterhouse capable of processing over 15,600 cows per year (2.4 billion MT)[87]
- **Cattle genetic improvement,** led by RAB, included artificial inseminations of 77,221 cows (15% of cow population in Rwanda) in 2016-2017, to improve dairy productivity.[88][89]

Key challenges and value chain needs

Rwanda's animal product sectors have limited capacity to grow in production due to highly fragmented and smallholder-based farming, limited access to feed, and low productivity of

[85] MINAGRI, 2017, Rwanda Livestock Master Plan
[86] Stakeholder interview, 2019 ;Dalberg, 2016 (Revised 2017), IFC Mapping and Analysis in Six Value Chains in East and West Africa: Uganda Dairy
[87] The New Times, 2018, Rwanda to get largest beef processing plant in Bugesera
[88] RAB, 2017, Annual Report 2016-2017
[89] MINAGRI, 2017, Livestock Master Plan

traditional breeds; However, there may be opportunities in small grazing animals. Most dairy farmers own 1-2 cattle each producing 5-15 liters of milk per day.[90] Both the farmgate price and market price for milk are low, leaving little margins for farmers and dairy processors compared to the investments needed for producing and processing milk. Limited access to quality feed is a challenge cross-cutting to all livestock and fish value chains, but even more particularly to Rwanda's meat export sector as it mostly consists of beef, which requires highly intensive feeding or grazing for high quality and quantity production. Lamb and goat meat, which currently account for only 6% of the total meat export,[91] have better production economics than beef as they require less feed and space. However, the East African market has a much smaller demand for lamb and goat meat than for beef, and Ethiopia, Kenya, and Tanzania export substantial amounts of lamb and goat meat to the Middle East.[92]

Production and productivity

- **Limited feed availability and quality –** Rwanda imports about $1 million animal feed, and over $2.4 million, when including food residues for feed preparations, annually. Investments in the past few years have enabled local processing of feeds, however, the total production volume capacity remains small: The three existing large processors produce a total of 2,500 MT of feeds per month, which can feed only one-third of Rwanda's poultry population. Furthermore, the cost of animal feed remains high for most of smallholder farmers, accounting for 60-70% of input cost, due to the high cost of raw materials (maize and soybean) – largely produced and imported from outside Rwanda.
- **Limited forage availability –** There is limited availability of land for commercial-scale forage production or grazing for grass-fed animals as they compete in land usage with other agricultural production for human consumption.
- **Low productivity of local breed –** 43% of cattle in Rwanda are local breeds but contribute to only 9% of total milk production due to their low genetic productivity potential.[93]

Quality management

- **Limited professionalism in quality control–** Few dairy producers are specialized farms equipped with dairy meat technologists; meat processors have limited meat-cutting and grading knowledge and skills.
- **Limited quality and safety standards enforcement –** In order to improve the quality of animal products and for the sector to be able to attract private investments, it is imperative to have a stronger enforcement of standards and regulations on animal breeding, animal commercial feeds formulation, grading and pricing, livestock identification, disease surveillance reporting, and livestock infrastructure development.[94]

Infrastructure for processing and cold chain logistics

- **Limited commercial scale processing infrastructure** that enables the efficient collection, handling, and processing of meat and dairy products in large volumes – e.g., slaughterhouses, laboratories, milk collection centers (MCCs), milk processing factories, etc.
- **Limited cold chain logistics and transport** pose challenges in storing and transporting highly perishable products such as meat and dairy to other countries in the region.

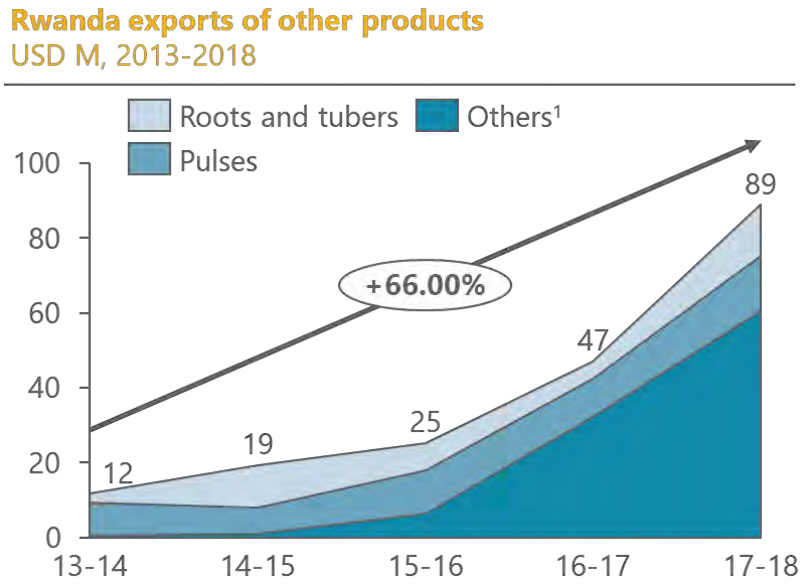
[90] Stakeholder interview, 2019
[91] NAEB, 2018, Formal and informal export 2017-2018
[92] UN COMTRADE data
[93] MINAGRI, 2017, Livestock Master Plan
[94] MINAGRI, 2017, Livestock Master Plan

Others sector performance and outlook

Past trends

Products in the other products category have rapidly increased in export value at a CAGR of 66% between 2013-14 and 2017-18. While roots and tubers, and pulses were the largest sub-categories, their export values showed fluctuations across the years as they were highly vulnerable to diseases and regional market price changes. Other miscellaneous products including groundnuts, soybeans, bananas, sunflower seeds, forestry, tobacco, and processed products such as cooking oil and sugar have a high aggregate export value but are mostly low-value commodities and informal exports. The rapid growth in others can be attributed to increasing capturing of informal export data in recent years.

Figure 58: Rwanda other products export value



Source: Dalberg analysis, 2019; NAEB, 2018, Formal and informal export 2017-2018; NISR, 2017, Statistical Yearbook; NAEB Strategic Business Plan 2019-2024
1 Others include all products that are not separately mentioned due to their small export values

There are a few nascent value chains that currently have insignificant export volumes, but might be good opportunities for investments, such as essential oils, stevia, sericulture, honey, and spices. The performance, market outlook, and challenges of essential oils and stevia are further detailed in sperate sections below.

New growth value chains

Beyond fastest growing sectors, there are new value chains with potential for future growth which should be tested in the upcoming years. New emerging value chains such as essential oils and stevia have shown recent signs of growth from a low value based. These value chains are worth testing in the upcoming years to identify potential growth opportunities among them. These new growth value chains may benefit from NAEB's ongoing support and targeted investments as they are nascent sectors with limited agronomic knowledge of farmers, infrastructure or regulations to support and enable accelerated growth.

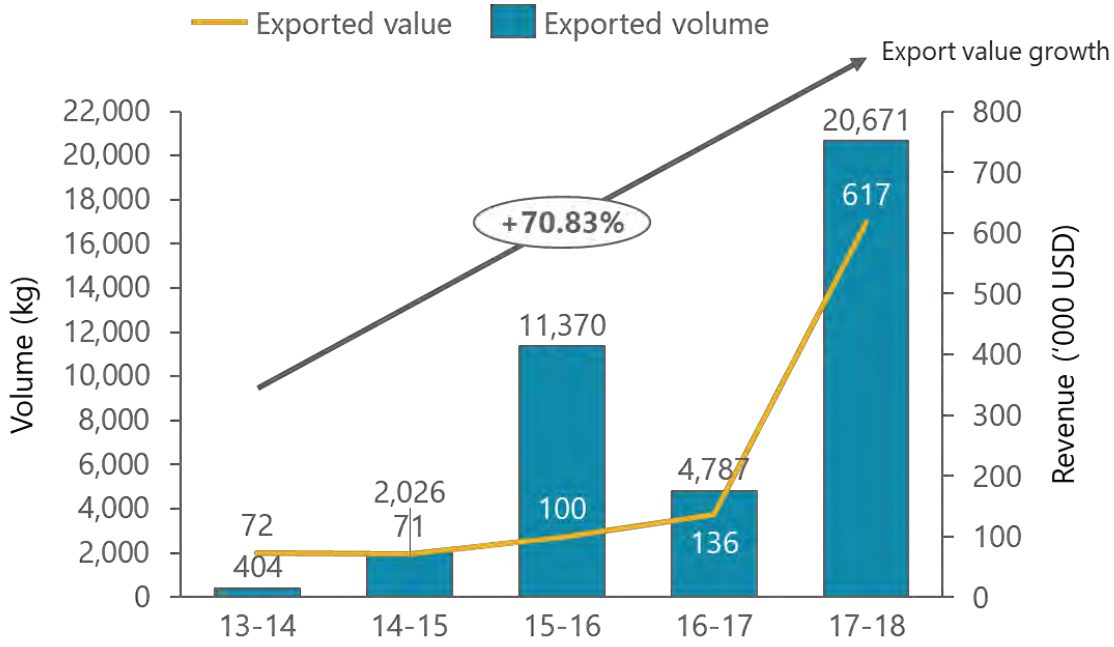
Essential oils and stevia are just two examples of new potential value chains that may see fast growth in the upcoming years, and NAEB's programs related to strategic analytics may identify and explore other nascent value chains with opportunities for fast growth. Products such as honey, sericulture, specialty mushrooms, herbs, and spices may qualify for such new growth value chains as they are already produced in Rwanda or can be produced well, sell at high prices in export markets, and have a positive outlook for the market in the next upcoming years. For example, Rwanda has excellent ecological factors for beekeeping, and progressively increased production and export of honey in recent years. Rwandan honey fetches a price ranging between 6-8 USD/kg in export markets, and the global market for honey is projected to grow due to increasing number of health-conscious consumers and the food and beverage industry looking for healthier alternatives to sugar.

Essential oils sector performance and outlook

Past export trends

Figure 59: Rwanda essential oils exports

Rwanda essential oils exports
'000 USD and kg, 2013-2018

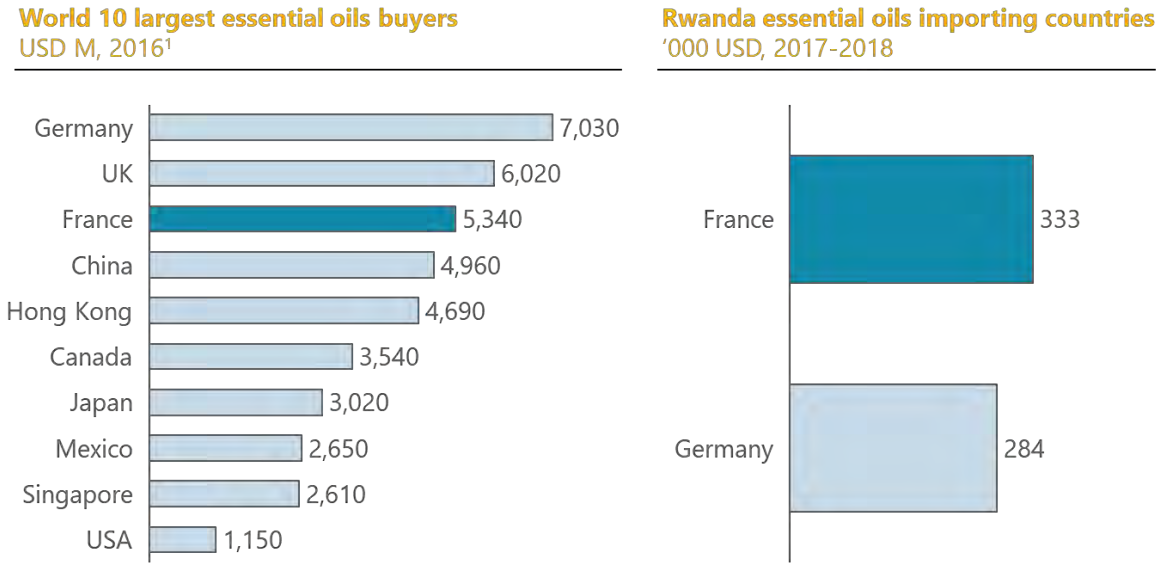


Source: NISR, statistical yearbook, 2017; NAEB June 2018 Report; Dalberg Analysis, 2019

- **Rwandan essential oils exports started off low** as the export market was led by one exporter from Rwanda. The export value **experienced fast growth in recent years** with more players progressively entering the market and diversifying into new export markets.

- **Rwanda exports essential oils to France and Germany, France being one of the largest buyers globally.** In 2017-2018, Rwanda exported 54% of its essential oils to France and the remaining to Spain. The five largest buyers of essential oils globally are Germany, UK, France, China, and Hong Kong. [95] The figure below presents Rwanda's essential oils exports destinations in comparison to the largest essential oils buyers.

Figure 60: Rwanda essential oils importing countries and world largest essential oils buyers



1: The latest available world data is for 2016
Source: NAEB, 2019, NAEB export and reexport values and export destinations 2017-2018; Harvard University, Center for International Development, 2016, ATLAS of economic complexity

Market outlook

The global essential oils market is projected to grow annually at 8.83% from 2017 to 2022, reaching 11.19 billion USD in 2022 – led by demand in food and beverages and spa and relaxation industries.[96] The essential oils market is segmented into several oil types including orange, lemon, lime, peppermint, corn mint, citronella, spearmint, geranium, clove leaf, eucalyptus, jasmine, tea tree, rosemary, lavender, and others oils.[97] The orange oil and corn mint oil segments respectively account for the highest market share, holding together more than 57% of market share in the year 2017.[98] These leading segments are followed by Peppermint, Eucalyptus, and Citronella. Demand for essential oils is driven globally by the food and beverages, spa and relaxation, medical, and cleaning & home industries respectively,[99] and is expected to rise to 1.19 billion in 2022, at an 8.83% CAGR.[100] Demand for organic essential oils is also expected to rise from a low base, at a CAGR of 11.37% during the period 2017-2021, driven by increasing health awareness and preference for organic products.[101]

[95] Harvard University, Center for International Development, 2016, ATLAS of economic complexity
[96] Research and markets, 2017, Global Essential Oils Market 2017-2022 by Product Type, Method of Extraction, Application
[97] Ibid.
[98] Market research future, 2017, Essential Oil Market Research Report- Forecast to 2023
[99] Research and markets, 2017, Essential Oils Market Size, Share & Trends Analysis Report 2019 - 2025
[100] Research and markets, 2017, Global Essential Oils Market 2017-2022 by Product Type, Method of Extraction, Application
[101] Technavio Research, 2017, Global organic essential oils market 2017-2021

The natural advantage of Rwanda in some types of essential oils puts it in a good position to take advantage of global market opportunities. Some essential oils such as Eucalyptus, geranium, and other emerging categories such as patchouli grow naturally in Rwanda. Rwanda has an opportunity to explore these essential oil products in the upcoming six years and to position itself into niche export markets such as organic essential oils.

Key challenges and value chain needs

Rwanda's essential oils sector is very nascent and is therefore marked by low production and local processing capacity for global market competition.

- **Low production and local processing capacity of essential oils, limiting export volumes.** Production is currently dominated by smallholder farmers with no connection to an aggregator. This leads to the production of small quantities, around 1 kg per farmer, while buyers are looking for large quantities (3-5 tons of extracts at once), leading to untapped market opportunities.[102]
- **Limited knowledge of farmers leading to the usage of essential oils trees for firewood:** Most farmers don't know the value of essential oil trees, which further reduces production.

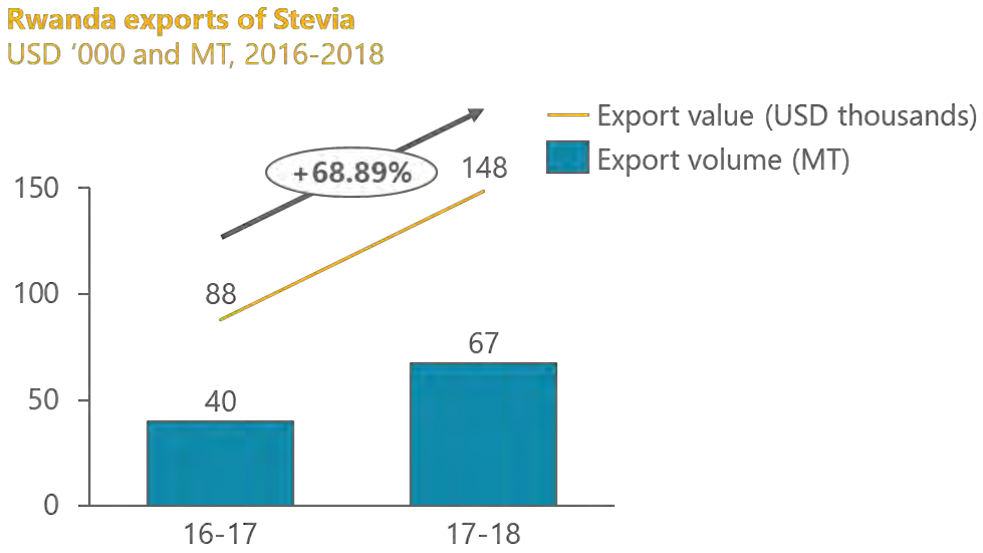
Stevia sector performance and outlook

Past trends

Stevia production and exports is nascent in Rwanda, with a small volume of exports that only started in 2016-17. Due to the small size, export value jumped quickly between 2016-2017 and 2017-2018 at the growth rate of 69%. This growth can be attributed to NAEB's support in land mobilization and expansion, and seedling production, as well as investments by SteviaLife Sweeteners, Ltd – the main commercial stevia producer in the country. PureCircle, a world's leading producer and processor of stevia sweeteners for food and beverage companies including Coca-Cola Co, is currently the sole buyer of Rwanda's Stevia exports.[103]

[102] NAEB, 2019, diversification division data
[103] Ibid.

Figure 61: Rwanda exports of stevia



Source: NAEB, 2018, Rwanda formal and informal export 2017-2018

Market outlook

The global market for stevia has reached a value of more than $492 million in 2018, and further projected to grow to nearly $818 million by 2024, with food and beverage industry holding the largest share.[104] Due to increasing awareness of health benefits associated with stevia, its market is expected to double between 2018 and 2024, reaching $492 million by 2024.[105] The market is segmented by application into the bakery, dairy food, beverages, dietary supplements, confectionery, and others. Global food and beverage manufacturers are the largest market segment and increasingly switching to natural sweeteners, totaling $110 million in 2013.[106]

Locally processing pure stevia extract has the potential to bring high revenue margins if Rwanda is able to produce sufficient volumes for a processing plant.[107] Stevia leaves are sold at $1,000-2,000 per MT, but the price could go up to as high as $5,000 per MT depending on the steviol glycoside content.[108] Pure stevia crude extract can fetch up to $200,000 per MT.[109]

China is the largest producer of stevia leaves, but also a large buyer of stevia leaves as it is increasing stevia extraction capacity. Regionally, Kenya is already supplying to large stevia product manufacturers in China, and Tanzania is also seeking to enter the market as stevia is increasingly recognized as a lucrative crop.

There is a growing market for organic stevia but limited to small brands selling organic zero-calorie sweeteners to supermarkets. While given the small volume there is more room for local processing at

[104] IMARC, Stevia Market: Global Industry Trends, Share, Size, Growth, Opportunity and Forecast 2019-2024
[105] IMARC, Stevia Market: Global Industry Trends, Share, Size, Growth, Opportunity and Forecast 2019-2024
[106] Mintel, 2013, Stevia set to steal intense sweetener market share by 2017, reports Mintel and Leatherhead food research
[107] Production on at least 1,000 hectares of land is necessary to meet a processing plant capacity. Currently, SteviaLife Sweeteners has identified close to 350 hectares of land available for stevia.
[108] Dalberg, 2019, stakeholder interview
[109] The New Times, 2018, New firm takes over stevia project from cash strapped SteviaLife Ltd

a smaller quantity, large food and beverage manufacturers will not pay for the price premium for the organic produce.

Rwanda has suitable agronomic conditions to produce stevia and competitive advantage in low labor cost, with an existing global operator involved in production locally. Stevia grows well in temperatures between 15°C and 35°C, and best on acidic to neutral soils with a pH range of 5.5-6.5, which is 38% of Rwanda's soil.[110] Stevia also requires intense weeding, and Rwanda's low labor cost can become a strength when competing against other major producers. There is an existing operator, SteviaLife Sweeteners, which has two farms totaling 146 hectares in Rulindo and Kirehe districts and is committed to working with out-growers, providing support to them, and planning to mobilize lands for additional plantations to reach a volume sufficient for establishing a processing plant.

Key challenges and value chain needs

Global food and beverage manufacturers, the major buyers in the market, have high volume demand that Rwanda is unable to meet with its current level of production. However, with a global stevia producing company operating in Rwanda and aggressively planning to expand its production, these challenges can be quickly resolved. Current challenges to overcome in the value chain are related to production and productivity and include:

- **Insufficient farmer knowledge –** Due to the nascency of the crop in Rwanda, few farmers know about stevia and hence cultivate it.
- **High input cost –** Seedling cost takes up a high proportion of the production cost, and farmers have to wait for a year to start harvesting.

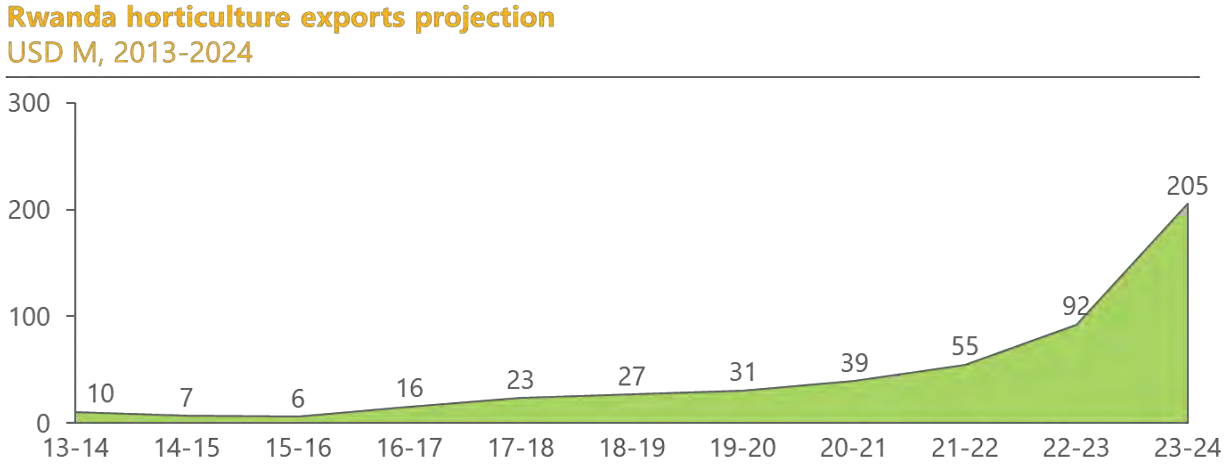
[110] PureCircle ; N.L Nabahungu, RAB-Rwanda, 2013, Rwandan Soil Health Status for Sustainable Food Security and Economic Growth

IV.3 EXPORT GROWTH DETAIL AND KEY NEEDS PER VALUE CHAIN

Horticulture

Growth projections

Figure 62: Rwanda horticulture export revenue projection



Source: Dalberg analysis, 2019; NISR, 2017, Statistical Yearbook 2017; NAEB, 2012/2013-2016/2017, Annual Reports

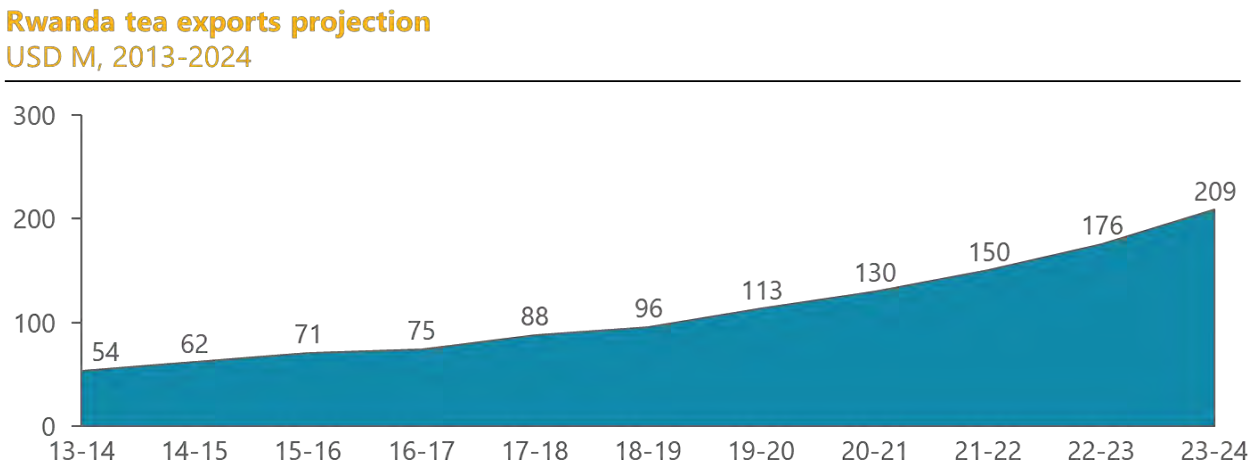
Projection assumptions

- **Exponential growth in high-value crops (Chili, French beans, flower, grapes, macadamia, mushroom, and passion fruit) export value,** capturing **3% of the EU market by 2024, up from current 0.34%**
- **High-value crops to increase in yields** (by 20%) and area planted to produce target volumes
- **Other horticulture crops' export to grow linearly,** both in volume and value at the historical growth rates

Tea

Growth projections

Figure 63: Rwanda tea export revenue projection



Source: Dalberg analysis, 2019; NISR, 2017, Yearbook 2017; NAEB Annual Reports 2012/2013-2016/2017

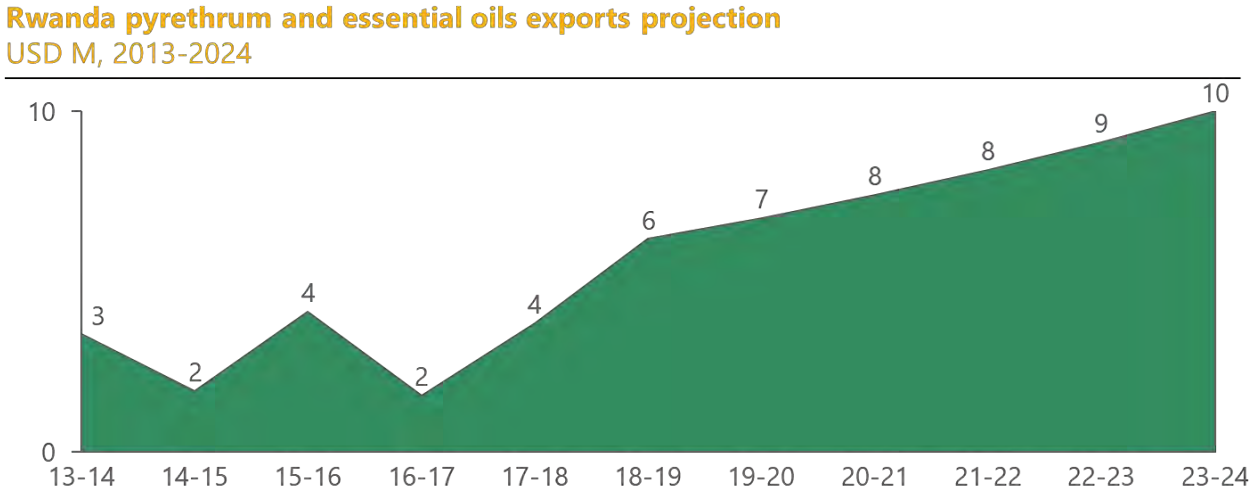
Projection assumptions

- **Continued growth in total tea export volumes,** reaching 3% of the global market by 2024
- **Diversified teas exported volumes to increase,** reaching 20% of the total tea exported volumes from Rwanda
- **Specialty tea to fetch a premium price of at least 35% above black tea prices**

Pyrethrum

Growth projections

Figure 64: Rwanda tea export revenue projection



Source: Dalberg analysis, 2019; NISR, 2017, Yearbook 2017; NAEB Annual Reports 2012/2013-2016/2017

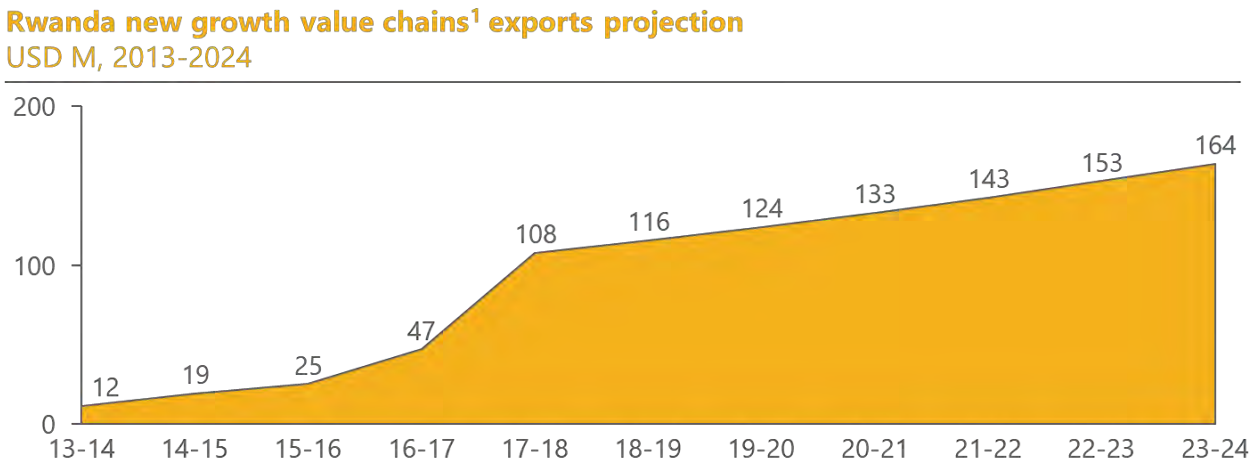
Projection assumptions

- **Export value to grow at the same rate as the global market demand** as NAEB strengthens existing trade partnerships and explores new ones
- Area planted to remain constant at 3,000 ha while yield to increase progressively from current 0.5 MT/ha to 0.8 MT/ha
- Pyrethrum extract to fetch an average price of $250

New growth value chains[111]

Growth projections

Figure 65: Rwanda new growth value chains export value projection



1 New growth value chains include stevia, essential oils, and honey
Source: Dalberg analysis, 2019; NISR, 2017, Statistical Yearbook; NAEB, 2012/2013-2016/2017, Annual Reports

Projection assumptions

- **Stevia, essential oils, honey and other newly identified value chains to experience fast growth** as they benefit from NAEB continued support and targeted investments
- Stevia and honey to grow at 50% of the historical growth rate for new growth value chains, and essential oils to grow at the global market CAGR.

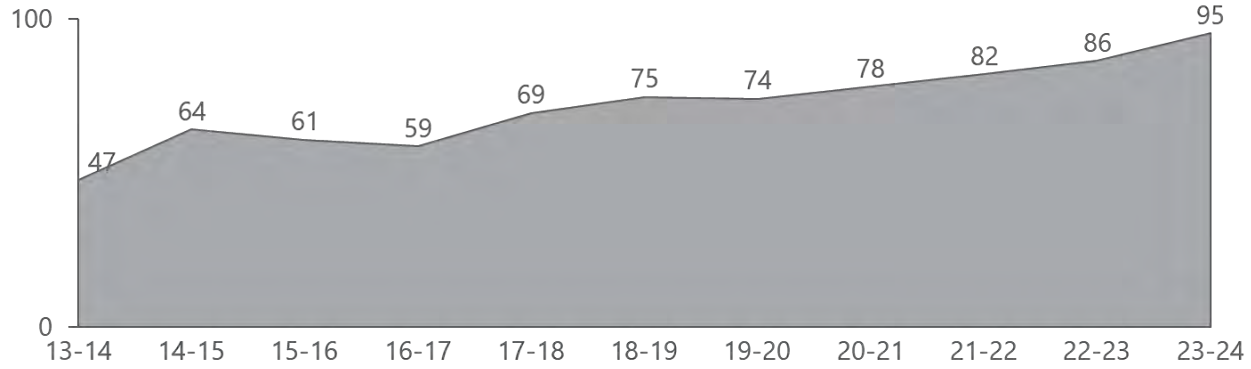
[111] New growth value chains include stevia, essential oils, and honey. Stevia, essential oils, and honey are illustrative examples of many high value crops that are nascent in Rwanda but well positioned to grow substantially with strategic support and investments. It is one of the Analytics and strategy team's role to identify high potential crops such as these two, and their needs.

Coffee

Growth projections

Figure 66: Rwanda coffee export revenue projection

Rwanda coffee exports projection
USD M, 2013-2024



1: 2014-2016 specialty coffee price from Africa as found in Transparent Trade Coffee, 2017, From transparency reports to a potential transaction guide for specialty coffee purchases, 2017
Source: Dalberg analysis, 2019; NISR, 2017, Yearbook 2017; NAEB Annual Reports 2012/2013-2016/2017

Projection assumptions

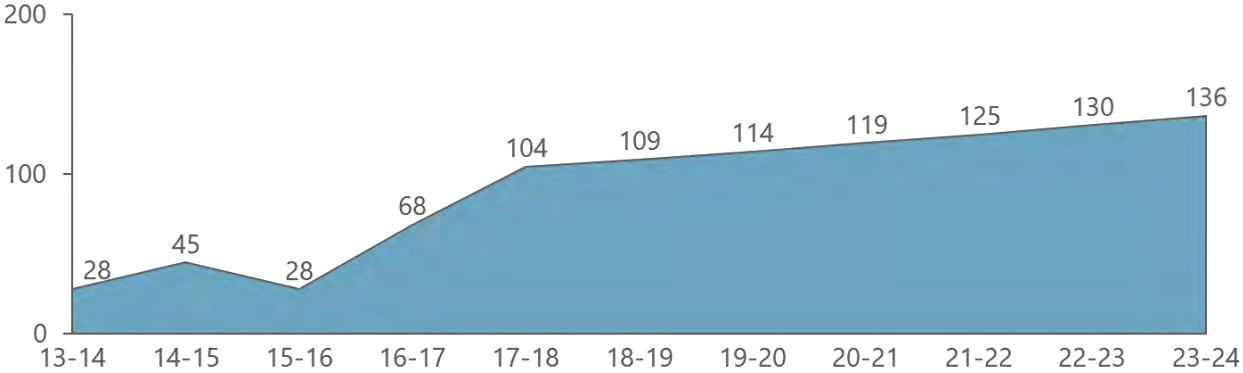
- Steady increase in coffee exports value as the specialty coffee exports increase to be 25% of total coffee exports and fetch higher prices
- Area planted to reduce by 5% while yield increases progressively at a 5% annual rate from current 0.5 MT/ha to 0.7 MT/ha by 2024
- Conventional coffee price to remain constant at the average price between 2012 and 2017

Cereals

Growth projections

Figure 67: Rwanda cereals export value projection

Rwanda cereals exports projection
USD M, 2013-2024



Source: Dalberg analysis, 2019; NISR, 2017, Statistical Yearbook; NAEB, 2012/2013-2016/2017, Annual Reports

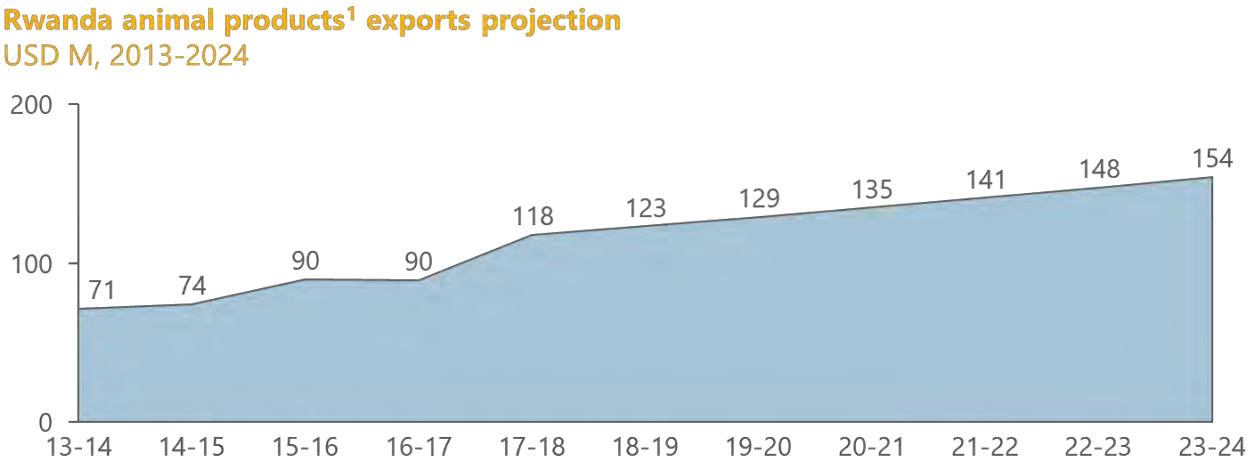
Projection assumptions

- **Export of processed cereals to grow at a slower rate than the historical trend** as the regional instability decreases and given Rwanda is not a surplus producer of grains
- More focus on **re-exports of value-added products**
- **Less focus on producing cereals for exports** (but for food security) to prioritize land for high-value crops
- **Yields to increase** in current areas planted

Animal products

Growth projections

Figure 68: Rwanda animal products export value projection



1 Animal products include milk, meat, live animals, hides and skins, fish, and eggs
Source: Dalberg analysis, 2019; NISR, 2017, Statistical Yearbook; NAEB, 2012/2013-2016/2017, Annual Reports

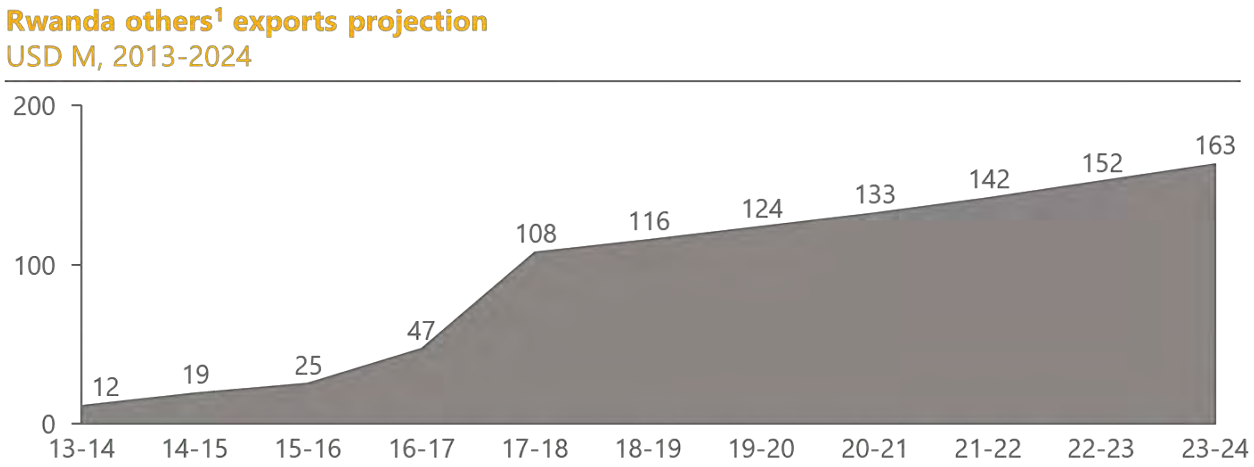
Projection assumptions

- **Export of value-added livestock products to grow at a slower rate than the historical trend**
- **Faster growth in small grazing animals** and derivatives, and in dairy added product

Others[112]

Growth projections

Figure 69: Rwanda others export value projection



1 Others include other exports, pulses, and roots and tubers, except new growth value chains
Source: Dalberg analysis, 2019; NISR, 2017, Statistical Yearbook; NAEB, 2012/2013-2016/2017, Annual Reports

Projection assumptions

- **Slower growth rate** as the regional instability decreases and low-value, regional crops to decrease in export values

[112] 'Others' include all other value chains not specified in this report and pulses and roots and tubers.

IV.4 DETAILED ANNUAL PROGRAMMATIC TARGETS (RESULTS FRAMEWORK)

Outcome	Value chains	17-18 (baseline)	18-19	19-20	20-21	21-22	22-23	23-24	Total
Branding									
Increased recognition of Rwanda brands as quality brands									
Market linkage									
# of unique buyer-exporter relations created		**0**	**0**	**4**	**6**	**9**	**13**	**17**	**49**
	Horticulture	0	0	2	3	5	8	12	**30**
	Tea	0	0	1	1	2	2	3	**9**
	Pyrethrum	0	0	0	1	0	1	0	**2**
	Coffee	0	0	1	1	1	1	1	**5**
	New growth value chains	0	0	0	0	1	1	1	**3**
Total sales value (USD)		**0**	**0**	**3,366,315**	**7,644,398**	**17,071,459**	**39,141,714**	**91,986,911**	**159,210,797**
	Horticulture	0	0	1,534,410	3,851,368	9,666,935	24,264,006	60,902,654	**100,219,372**
	Tea	0	0	1,134,765	2,530,526	5,643,073	12,584,053	28,062,439	**49,954,857**
	Pyrethrum	0	0	0	377,136	460,106	561,329	684,822	**2,083,393**
	Coffee	0	0	697,140	885,368	1,124,417	1,428,010	1,813,572	**5,948,506**
	New growth value chains	0	0	0	0	176,928	304,317	523,424	**1,004,669**
# of product lines		**0**	**0**	**4**	**4**	**2**	**0**	**0**	**10**
	Horticulture	0	0	1	2	2	0	0	**5**
	Tea	0	0	1	1	0	0	0	**2**
	Pyrethrum	0	0	1	0	0	0	0	**1**

	Coffee	0	0	1	1	0	0	0	**2**
	New growth value chains	0	0	0	0	1	0	0	**1**
Global operator attraction									
Outcome	**Value chains**	**17-18 (baseline)**	**18-19**	**19-20**	**20-21**	**21-22**	**22-23**	**23-24**	**Total**
# of value chain specific businesses attracted		**0**	**0**	**0**	**2**	**0**	**5**	**3**	**10**
	Horticulture	0	0	0	1	0	2	2	**5**
	Tea	0	0	0	1	0	1	1	**3**
	Pyrethrum	0	0	0	0	0	1	0	**1**
	New growth value chains	0	0	0	0	0	1	0	**1**
Total investments attracted		**0**	**0**	**0**	**50,000,000**	**10,000,000**	**30,000,000**	**25,000,000**	**115,000,000**
	Horticulture	0	0	0	0		0	0	**0**
	Tea	0	0	0	50,000,000	0	25,000,000	25,000,000	**100,000,000**
	Pyrethrum	0	0	0	0	10,000,000	0	0	**10,000,000**
	New growth value chains	0	0	0	0	0	5,000,000	0	**5,000,000**
Business incubation									
Outcome	**Value chains**	**17-18 (baseline)**	**18-19**	**19-20**	**20-21**	**21-22**	**22-23**	**23-24**	
New businesses supported		**0**	**0**	**0**	**7**	**13**	**14**	**16**	**50**
	Horticulture	0	0	0	5	11	13	15	**54**
	Pyrethrum	0	0	0	1	0	0	0	**1**
	New growth value chains	0	0	0	0	1	1	1	**3**
	Ag tech and innovation businesses	0	0	0	1	1	0	0	**2**

Productivity and quality management									
Outcome	**Value chains**	**17-18 (baseline)**	**18-19**	**19-20**	**20-21**	**21-22**	**22-23**	**23-24**	**0**
New land area under cultivation (ha)		0	0	2000	2000	2000	2000	2000	**10,000**
	Horticulture								**0**
	Tea	0	0	2,000	2,000	2,000	2,000	2,000	**10,000**
	Pyrethrum	0	0	0	0	0	0	0	**0**
	New growth value chains		N/A	N/A	N/A	N/A	N/A	N/A	**N/A**
	Coffee								
	Cereals	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**0**
	Animal products	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**0**
Yield (MT/ha)									
	Horticulture								
	Tea (early estates)	0.8	0.9	1.1	1.3	1.6	1.9	2.2	**N/A**
	Tea (adolescent estates)	3.3	3.6	4.0	4.4	4.9	5.4	6.0	**N/A**
	Pyrethrum	0.5	0.5	0.6	0.6	0.7	0.7	0.8	**N/A**
	New growth value chains	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**
	Coffee	0.5	0.5	0.6	0.6	0.6	0.7	0.7	**N/A**
	Cereals	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**
	Animal products	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**
# of exporters supported		0	0	13	17	21	27	52	**130**
	Horticulture	0	0	10	12	15	20	45	**102**
	Tea	0	0	2	3	4	5	5	**19**

	Pyrethrum	0	0	0	1	0	0	0	**1**
	New growth value chains	0	0	0	0	1	1	1	**3**
	Coffee	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**0**
	Cereals	0	0	1	1	1	1	1	**5**
	Animal products	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**0**
# of farmers supported		0	0	49,200	68,090	94,371	131,000	182,147	**524,809**
	Horticulture	0	0	8,500	12,750	19,125	28,688	43,031	**112,094**
	Tea	0	0	4,500	6,120	8,323	11,320	15,395	**45,657**
	Pyrethrum	0	0	1,200	1,620	2,187	2,952	3,986	**11,945**
	New growth value chains	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**0**
	Coffee	0	0	35,000	47,600	64,736	88,041	119,736	**355,113**
	Cereals	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**0**
	Animal products	N/A	N/A	N/A	N/A	N/A	N/A	N/A	**0**
Market feedback (Improved feedback from buyers/market based on qualitative assessment; in relation to market linkage activities)									
Logistics & infrastructure coordination									
Outcome	**Value chains**	**17-18 (baseline)**	**18-19**	**19-20**	**20-21**	**21-22**	**22-23**	**23-24**	**Total**
Businesses supported		0	0	10	17	27	37	54	**145**
	Horticulture	0	0	5	8	13	18	28	**72**
	Coffee	0	0	5	8	13	18	25	**69**
	Cereals	0	0	0	1	1	1	1	**4**
Financing									

Outcome	Value chains	17-18 (baseline)	18-19	19-20	20-21	21-22	22-23	23-24	Total
Input revolving funds developed				**1**	**0**	**1**	**0**	**0**	**2**
Policy and regulation									
Outcome	**Value chains**	**17-18 (baseline)**	**18-19**	**19-20**	**20-21**	**21-22**	**22-23**	**23-24**	**Total**
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Strategic analytics									

IV.5 NAEB ORGANIZATIONAL STRUCTURE

Figure 70: NAEB's organizational structure