



# Rwanda Vegetables Inclusive Growth Strategy

CASA Component A

*July 2023*

Supported by



## Table of Contents

List of Tables .....	4
List of Figures .....	4
Acronyms.....	5
Executive Summary .....	7
1. Background.....	9
1.1. CASA Programme Overview.....	9
1.2. Context, Purpose and Approach .....	9
2. Sector Overview.....	11
2.1. International Context.....	11
2.2. National Context .....	12
2.3. CASA Focus Regions .....	17
3. Market System .....	19
3.1. Sector Map .....	19
3.2. Core Market Functions and Actors.....	21
3.2.1 Input Supply .....	21
3.2.2 Production.....	22
3.2.3 Distribution, Aggregation, Processing, and Marketing. ....	24
3.2.4 Consumption.....	29
3.3. Key Supporting Function Services and Actors .....	30
3.3.1 Farm labour.....	31
3.3.1 Access to agricultural extension and market linkage services .....	31
3.3.2 Equipment Providers.....	32
3.3.3 Financial Services .....	33
3.3.4 Transport and Logistics .....	36
3.3.5 Certification Services .....	37
3.3.6 Business Development Service Providers.....	37
3.3.7 Research and development services.....	38
3.3.8 Existing donor projects .....	38
3.4. Enabling Environment Issues and Actors .....	38
3.4.1 Policies .....	39
3.4.2 Standards.....	40
3.4.3 Private sector bodies.....	41
4. Problem Analysis .....	41
4.1. Problems and Underlying Causes.....	41
4.2 Poor Quality and Quantity of SHF Vegetable Production.....	43

4.3 Lack of Reliable Market for Vegetables Produced by SHFs: .....	45
5. Strategy for Change .....	47
5.1. Market Potential, Opportunities, and Growth Potential .....	47
5.2. Vision of Change .....	48
6. Interventions .....	48
6.1. Intervention Areas and Project Outlines .....	48
6.2. Sequencing and Prioritisation of Projects .....	53
7. Stakeholder Assessment .....	53
8. Preliminary Assessment of Potential Partners .....	55
Annexes .....	57
Annex 1. Next Steps .....	57
Annex 2. Relevant Government Ministries and Donor Initiatives .....	59
Annex 3. List of Potential Partners .....	62
Annex 4. List of key informants .....	72

## List of Tables

<i>Table 1: Highlights of the main vegetables produced in Rwanda .....</i>	<i>14</i>
<i>Table 2: Estimated income potential for SHFs in the key vegetables in Rwanda.....</i>	<i>25</i>
<i>Table 3: The volume of vegetables sold, and the generated revenues 2021 – 2022 .....</i>	<i>28</i>
<i>Table 4: Profiling the types of finance available to SHFs and SMEs in the market system ..</i>	<i>34</i>
<i>Table 5: Intervention Logic Analysis Framework highlighting the connections between the problems of the beneficiaries and the interventions.....</i>	<i>50</i>
<i>Table 6: Sequencing of interventions in the vegetable market system. ....</i>	<i>53</i>

## List of Figures

<i>Figure 1: World vegetable production 2020 in million MT.....</i>	<i>11</i>
<i>Figure 2: Vegetable use by farmers (%) .....</i>	<i>13</i>
<i>Figure 3: Vegetables production performance (2013-2022).....</i>	<i>13</i>
<i>Figure 4: Veg. Prod and Domestic Market (M. USD).....</i>	<i>15</i>
<i>Figure 5: Vegetable Imports &amp; Exports (M. USD).....</i>	<i>16</i>
<i>Figure 6: Top Eight (8) Vegetable-producing Districts (above 15,000 T/Yr.).....</i>	<i>18</i>
<i>Figure 7: Market map for the vegetables value chain in Rwanda based on participatory workshop, literature review and KIIs.....</i>	<i>20</i>
<i>Figure 8: Problem analysis for poor quality and quantity vegetable production in Rwanda..</i>	<i>43</i>
<i>Figure 9: Problem analysis for volatile market demand and price for vegetables in Rwanda</i>	<i>45</i>
<i>Figure 10: The Power-Interest matrix of stakeholders and engagement strategies .....</i>	<i>53</i>
<i>Figure 11: The willingness and capacity matrix .....</i>	<i>55</i>

## Acronyms

<b>AFCFTA</b>	African Continental Free Trade Area
<b>BDS</b>	Business Development Services
<b>BEE</b>	Business Enabling Environment
<b>CASA</b>	Commercial Agriculture for Smallholders and Agribusiness
<b>CIP</b>	Crop Intensification Programme
<b>CNFA</b>	Cultivating New Frontiers in Agriculture
<b>COMESA</b>	Common Market for East and Southern Africa
<b>CSA</b>	Climate Smart Agriculture
<b>DRC</b>	Democratic Republic of the Congo
<b>FCDO</b>	Foreign & Commonwealth Development Office (formerly DfID)
<b>GESI</b>	Gender and Social Inclusion
<b>GoR</b>	Government of Rwanda
<b>ICF</b>	International Climate Finance
<b>KII</b>	Key Informant Interview
<b>KIIWMP</b>	Kayonza Irrigation and Integrated Watershed Management Project
<b>KWAMP</b>	Kirehe community-based Watershed Management Project
<b>LWH</b>	Land Husbandry, Water harvesting and Hillside irrigation.
<b>MEL</b>	Monitoring, Evaluation and Learning
<b>MFI</b>	Micro Financing Institution
<b>MINAGRI</b>	Ministry of Agriculture
<b>MINECOFIN</b>	Ministry of Finance and Economic Planning
<b>MRM</b>	Monitoring and Results Measurement
<b>MSD</b>	Market Systems Development
<b>MT</b>	Metric Tons

<b>NAP</b>	National Agriculture Programme
<b>NISR</b>	National Institute of Statistics Rwanda
<b>NST</b>	National Strategic Transformation
<b>OAF</b>	One Acre Fund
<b>OFSP</b>	Orange Flesh Sweet Potato
<b>PSTA</b>	Strategic Plan for Agriculture Transformation
<b>RDB</b>	Rwanda Development Board
<b>RSSP</b>	Rural Sector Support Project
<b>RWF</b>	Rwanda France
<b>SACCO</b>	Saving and Credit Cooperative Organisation
<b>SAIP</b>	Sustainable Agriculture Intensification and food Security Project
<b>SHF</b>	Smallholder Farmer
<b>SMEs</b>	Small and Medium Enterprises
<b>STTA</b>	Short Term Technical Assistance
<b>TA</b>	Technical Assistance
<b>TAF</b>	Technical Assistance Facility (Component B of CASA)
<b>ToR</b>	Terms of Reference
<b>ToT</b>	Training of Trainers
<b>USD</b>	United States Dollar
<b>VAT</b>	Value Added Tax
<b>VC</b>	Value Chain
<b>VSLA</b>	Village Savings and Lending Associations
<b>WHO</b>	World Health Organisation

## Executive Summary

The primary focus of the Commercial Agriculture for Smallholders and Agribusinesses (CASA) programme is to make the commercial and development case for investing in agribusinesses that source produce from smallholders. It aims to demonstrate how this can be done effectively by bridging evidence gaps and by ensuring investors and policymakers have access to the right information and people to make inclusive agribusiness models succeed, and private sector companies have access to relevant and appropriate support services. This is achieved by changing how investors, donors and government's view and invest in agribusinesses that work with smallholder supply chains.

CASA selects 'anchor value chains', where several interventions can be implemented to demonstrate solutions to various constraints or barriers in the market, or capitalise on opportunities, and are designed to address access to better and lucrative markets which results in higher incomes for participating small holder farmers (SHFs), as well as improved climate change adaptation and resilience, and food security.

In response to the global food security crisis caused by the Russian invasion of Ukraine, CASA Component A is now expanding its work with agribusinesses in two new countries, Rwanda and Ethiopia, after successfully implementing activities in Malawi, Nepal, and Uganda.

Using a market systems development approach, the CASA Rwanda team has undertaken a rigorous systems selection process to identify three key sectors (poultry, aquaculture, and vegetables) for intervention, followed by an in-depth system analysis of the respective sectors. This report maps the vegetables sector, including its core market functions and actors, key supporting services and actors, as well as enabling environment issues and actors. It then provides a problem and root-cause analysis of the sector, addresses any information gaps, puts forward a strategy and vision of change, and suggests potential interventions, partners, and key stakeholders for interaction. This document will form the basis for intervention design and concept note development for projects that will ultimately make up CASA Rwanda's opening portfolio.

In Rwanda, 311,000 households are involved in smallholder vegetable production. Whilst there are no official statistics on produce from SHFs vs large producers, SHFs contribute significantly to the 376,200 tons of vegetables produced in Rwanda annually, valued at 524.5 million United States dollars (USD), constituting 15% of the country's Agricultural Gross Domestic Product (GDP). This sizeable economic contribution was realized on 39,200 ha, accounting for only 1.5% of the total cultivated lands over three agricultural seasons (A, B and C). This highlights the significant economic opportunities available to SHFs through vegetable production, where net incomes can range from \$1,000 - \$15,000 per hectare per year. Income opportunities are significantly variable across the most produced varieties of vegetable in Rwanda, which include eggplant (~\$1,000/ha), tomato (~\$1,100/ha), onion (~\$5,500/ha), French beans (~\$1,500/ha), garlic (~\$5,000/ha) and chilli (~\$3,000). Whilst these varieties are produced across the country, particular hubs of SHF and SME market activity are seen in North-Western and Eastern Regions as well as the Kigali area. Most of this produce is grown for market (80%) of which ~97% goes to informal and poorly organised domestic markets and ~3% is sold to high value export markets.

Despite the opportunities, there are several challenges across the core market system. SHFs are typically unorganised, with membership of specific vegetable cooperatives at only 15% nationally (although many are members of more general cooperatives). Where organisation into farmer groups/cooperative membership is present, SHFs have been able to access improved markets and coordinate production through access to inputs and investment in infrastructure. Despite some success stories, many cooperatives are ineffective and the consequent lack of organisation is closely linked to poor access to inputs and finance

(especially for women SHFs) and weak market linkages for SHFs, who typically sell individually to traders, negotiating (often low) prices based on a visual appraisal of their plot. Once the produce is sold to local traders, much of it is wasted in transit and at the local markets due to inadequate transportation and storage facilities, further driving down the price received by the SHF. Other marketing options exist in higher value export markets, which are a growing policy priority for the Government of Rwanda. However, SHFs often have fractious relationships with exporters, characterised by mistrust and shifting prices. Relationships between exporters and SHFs suffer from exporters lack of capacity to engage SHFs and provide extension to meet the trade standards and certifications required to service large international buyers. Finally, despite the large opportunity available and ability to counter post-harvest loss issues, there is a relative lack of processing industry for vegetables in Rwanda. This is largely linked to the lack of market stability and access to finance which discourages SMEs and SHFs from investing in value addition. Climate induced rainfall variability resulting in drought in some regions and flooding in others, impacts vegetable production, meaning they are often only grown in one of Rwanda's three planting seasons, further exacerbating market volatility. As such, there are opportunities to promote climate smart agriculture practices and infrastructure, such as drip irrigation and greenhouses, that will extend the production period.

The above analysis has led to the identification of two key groups of challenges related to production and marketing of vegetables. Responding to these challenges requires harnessing 5 key drivers of change: (1) Increased organisation amongst SHF producers to facilitate access to inputs and improved technical and financial services to improve quality and quantity of production; (2) Improving value addition and processing capacity; (3) Improved market linkages between SHFs and aggregators, processors, or exporters; (4) Improved exporter and aggregator/processor capacity to provide significant offtake; and (5) Leveraging increased investments into the vegetable sector.

These drivers of commercialisation can help deliver the vision of a vegetable market system where quality produce and productivity from SHFs and SMEs through increased access to investment, affordable inputs, appropriate technical, organisational and managerial support and fair market linkages both domestically and internationally for male and female SHFs creates a sector in which SHFs and SMEs thrive and their businesses are mitigating climate impacts and providing adaptation and resilience to those already being felt. To achieve this vision, we have identified 11 key intervention areas in which CASA can pursue activity:

1. Facilitate technical assistance (TA) to existing cooperatives to improve GESI, organisation and professionalism of vegetable production (marketing, access to inputs and finance).
2. Link cooperatives with TA on climate smart agriculture (CSA) for greater resilience.
3. Link cooperatives with SME offtakers such as exporters and processors who can provide training on CSA practices to improve quantity and quality of produce for markets.
4. Work with market linkage providers to help improve their capacity to reach more SHFs and SMEs or look to privately scale the One Acre Fund (OAF) model through other SMEs.
5. Help processors access sufficient finance to improve efficiency and capacity (with climate change mitigation) of processing units to allow more SHFs into the supply chain.
6. Provide TA to SMEs and cooperatives interested in starting up basic processing.
7. Provide TA to SMEs on how to equitably engage SHFs, learning lessons from existing service providers and linking the SMEs to onward markets.
8. Raise awareness on the opportunities/benefits of cold storage for traders and consumers and pilot innovative business models on integrating cold storage into the market system.
9. Work with SMEs, SHFs and standards bodies to access the finance and TA required to make certification processes more accessible and large markets easier to penetrate.
10. Help exporters to leverage the finance required to improve storage capacity and connect to larger buyers to warrant investment.
11. Work with financiers, SMEs and SHFs to connect to existing and co-create new financial products for development of the vegetable market system.



# 1. Background

## 1.1. CASA Programme Overview

The Commercial Agriculture for Smallholders and Agribusinesses (CASA) programme makes the commercial and development case for investing in agribusinesses that source produce from smallholders. It aims to demonstrate how this can be done effectively by bridging evidence gaps and by ensuring investors and policymakers have access to the right information and people to make inclusive agribusiness models succeed.

In support of this approach, Foreign, Commonwealth and Development Office (FCDO) has been funding the CASA programme since 2019 with the aim of changing how investors, donors and government's view and invest in agribusinesses that work with smallholder supply chains. In doing so, CASA is increasing economic opportunities for thousands of smallholder producers by:

- a. Demonstrating the commercial viability of small and medium-sized enterprises (SME) agribusiness with significant smallholder supply chains and attracting more investment into these businesses;
- b. Deepening the smallholder impact of existing investments made by Development Finance Institutions and impact investors;
- c. Enabling poor smallholder farmers to engage with and trade in commercial markets; and,
- d. Researching and communicating the case for successful engagement with smallholder-linked agribusiness.
- e. Improving food production and security, and fertiliser production.

CASA's Components A and C are managed by NIRAS in partnership with Swiss Contact and CABI. Component A is currently managing interventions on the ground in Malawi and Nepal, (and previously Uganda) with partner agri-businesses (including commercially minded producer groups), while Component C is a learning and knowledge-sharing component for upscaling and replication.

Having received additional funds from FCDO to combat against the global impact caused by the Russian invasion of Ukraine, CASA is now looking to expand its work with agribusiness on the ground into two new countries, Rwanda and Ethiopia.

## 1.2. Context, Purpose and Approach

In line with the agreed expansion plan, CASA began work in Rwanda in October 2022. The first six months were dedicated to inception phase activities. This involved carrying out an assessment to identify two focus sectors, conducting detailed market analyses of each sector, and developing inclusive growth strategies for each identified value chain. The country team concluded the value chain selection process in February 2023, using several parameters of consideration to rank potential value chains:

- Potential to respond to food security needs of the country.
- Potential number of SHFs involved.
- Potential to increase income of SHFs.
- Potential to leverage investment by the private sector.
- Potential to improve nutrition.

- Potential to address gender equality and social inclusion (GESI) needs. Potential for a positive impact on climate and environment and resilience to adverse climate

Following the selection process, poultry and aquaculture were selected as the two initial value chains (VCs) for CASA Rwanda. Whilst both poultry and aquaculture have been developed into concept notes and business plans, the availability of additional funds through the FCDO Centre of Expertise for Green Growth meant that CASA can expand into another VC in Rwanda. As such, drawing on the previous VC selection process and increased focus on climate contributions of interventions due to ICF funding, vegetable was selected as the third VC for Rwanda.

Following its selection, the next stage of the process was to map the market system for vegetables, identifying challenges and opportunities for intervention. It was also necessary to select target provinces for the study, which is discussed in section 2.3. The market mapping and analysis stage of the process has adopted a participatory market systems development (MSD) approach, using three key modalities of data collection: literature review, key informant interviews (KII) and participatory market mapping workshops.

The literature review encompassed a range of sources from private and public sector actors as well as research institutions. The KIIs were undertaken online and during site visits with actors from across the core market, supporting services, and enabling environment. A full list of engaged actors is given in Section 7 of this report. The KIIs served to understand the existing state of play in the market system as perceived by the actors directly and indirectly involved in it, as well as to inform the team of the political economy of the market system. Following the KIIs, two participatory workshops were held with key market actors in the selected VC. These workshops followed a semi-structured process, which was adapted on the day to flow with the contributions offered by VC actors. The key components of the workshop were:

- A market role playing game to encourage actors to view their market system from a birds-eye view and engage with the perspectives of actors in the market system they may not commonly interact with.
- Participatory systems mapping was then used to scope the key actors in the core market, issues in the enabling environment and services in the support market, documenting how they interact with each other and where opportunities and challenges are present;
- All the identified problems were listed, and the top two problems prioritised for a root cause analysis which aimed to get to the basis of the most pressing challenges facing the VC to then identify areas for intervention;
- Having discussed the central challenges facing the market system, a systems visioning exercise was undertaken to allow the VC actors to develop and align behind a vision of what a well-functioning market system would look like for their VC;
- The system vision and problem analysis were then used to help identify potential solutions to the root causes identified, focusing on how existing market actors, especially SHFs, and SMEs, could be placed at the heart of these solutions;
- The final exercise was to debrief and discuss the findings of the workshop and communicate the next steps to stakeholders to manage their expectations and to also encourage them to continue the conversations that had been initiated and facilitated by the CASA team at the workshops.

The findings from the above data collection provided the basis for this subsequent IGS. They have been used to populate several MSD tools, including market maps (Figure 7), problem trees (Figure 8 and 9) and an Interventional Logical Analysis Frameworks (Table 6). These tools' structure a narrative on the existing state of play in the market system, including existing

challenges and opportunities, and offer several possible intervention streams that can facilitate SME actors to resolve and/or capitalise on these to the benefit of SHFs.

## 2. Sector Overview

### 2.1. International Context

Globally, demand for vegetables is increasing, growing an average between 2000 and 2021, the global production volume of vegetables has increased significantly, from 682 million metric tons (MT) in 2000 to more than 1.15 billion MT in 2021. The global vegetable production has seen a significant increase over the past two decades, reaching 1.5 billion MT in 2018 and continuing to grow since then. Tomato was the most produced vegetable worldwide in 2019. As of 2023, the global Fresh Fruits and Vegetables market was estimated at USD 156,054.35 million, and it's anticipated to reach USD 211,240.84 million in 2028.

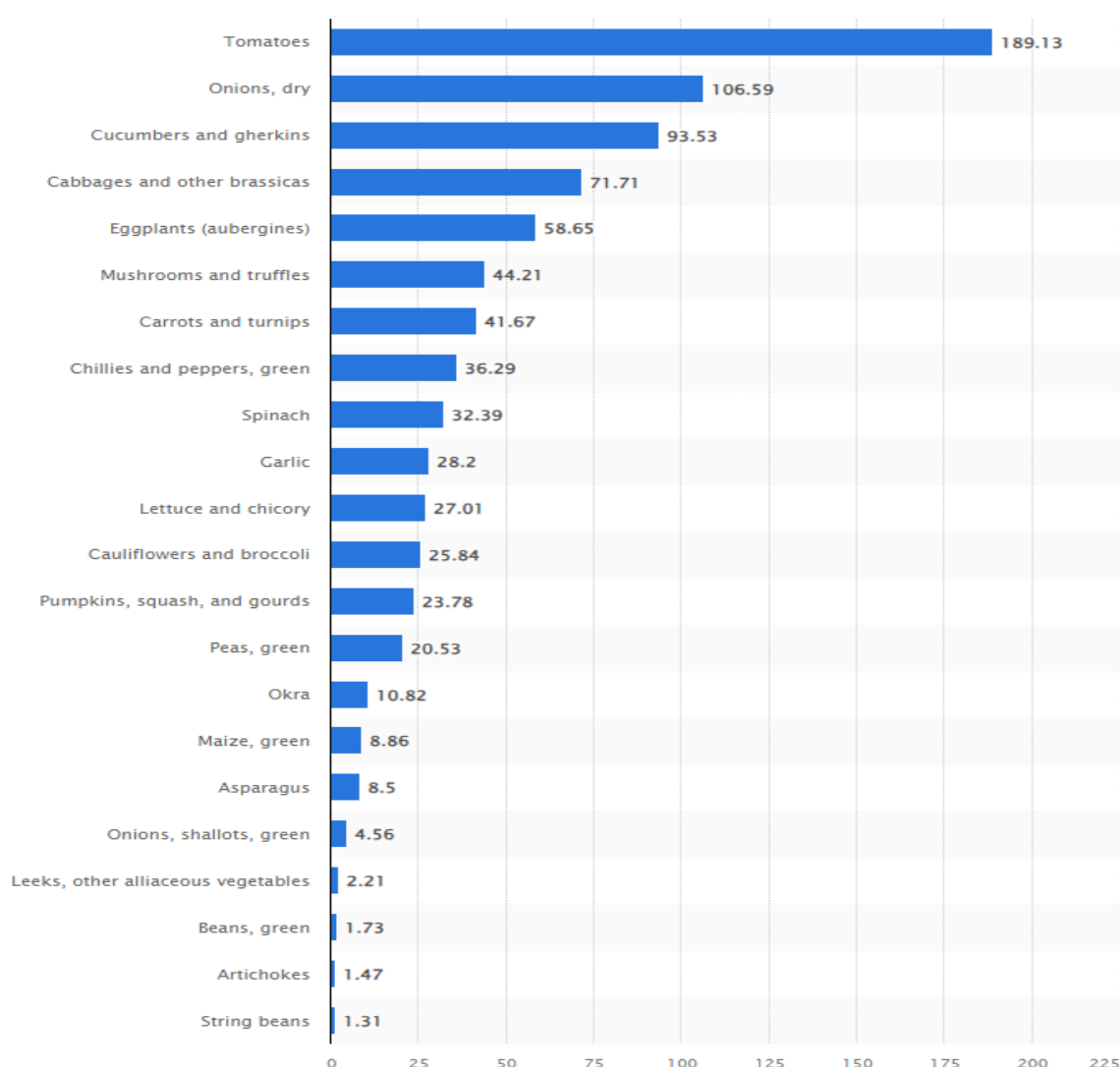


Figure 1: World vegetable production 2020 in million MT<sup>1</sup>

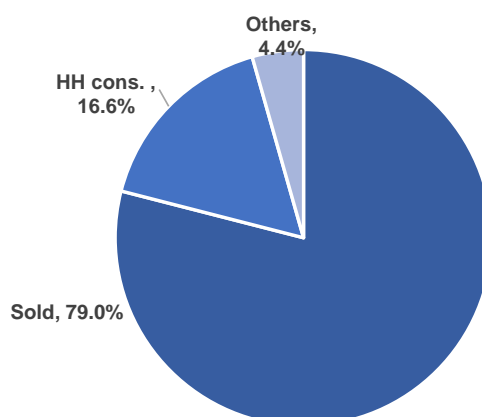
<sup>1</sup> FAO. 2020. Fruit and vegetables – your dietary essentials. The International Year of Fruits and Vegetables, 2021, background paper. Rome. <https://doi.org/10.4060/cb2395en>

**Horticultural export, including vegetables<sup>2</sup>, is a priority area for agriculture across the East Africa Community (EAC).** Currently, trade in fruits and vegetables between EAC and the EU is estimated at 187,000 tons per year and valued at around \$455.9 million. This does not include significant markets in the Middle East. Reflecting the economic importance of horticulture exports, the EAC's 2021 – 2023 strategic plan to double its fruit and vegetable exports to \$900 million in the next eight years. Specifically, the region also plans to increase vegetable production by five percent of area cultivated, to 45 million hectares from 32.8 million hectares, with productivity increasing by at least three percent. There is also a significant intra-regional market for vegetables. As part of its strategic plan, the EAC aims to boost the intra-regional trade in fruit and vegetable products from the current \$9.9 million to \$25 million by 2031.<sup>3,4</sup>

## 2.2. National Context

**In Rwanda, agriculture contributes 28% of the National Domestic Product (GDP) with the vegetable sector as a significant contributor to the country's agriculture economy.** Horticulture production in Rwanda is highly distributed in all 30 districts. The four key categories of horticulture produce in Rwanda are vegetables, fruits, nuts, and flowers (vegetables contributing for around 73%). Vegetables cultivation activity is undertaken countrywide, providing exceptional opportunities for farmers through employment creation and income generating businesses<sup>5</sup>.

**In 2022, 311,000 households (about 14% of the 2.3 million households engaged in agriculture activities) were engaged in vegetable farming in Rwanda.** Whilst there are no official statistics on the amount of Rwanda's vegetable produce that come from SHFs, it can be said with confidence that SHFs produce the vast majority of the 376,200 tons of vegetables produced in Rwanda annually, valued at 524.5 million United States dollars (USD), constituting 15% of the country's Agriculture Gross Domestic Product (GDP). This sizeable economic contribution was realized on 39,200 ha, accounting for only 1.5% of the total cultivated lands of about 2.7 million hectares (ha) over three agricultural seasons (A, B and C). At the SHF level, vegetable production is a major source of income for rural households with small plots, particularly for women and youth. Vegetables are mainly produced for the local market, with farmers selling about 80% of their vegetable production, consuming 17% and 4.4% retained for informal trading with neighbours and lost to wastage (Fig.2.). A typical vegetable producer grows a selected vegetable type on 0.13 ha per year and produces 1.2 tons, valued at 1,691.9 USD.



<sup>2</sup> Note that vegetables are often clustered with broader statistics on horticulture, wherever possible this report seeks to differentiate figures specifically for vegetables.

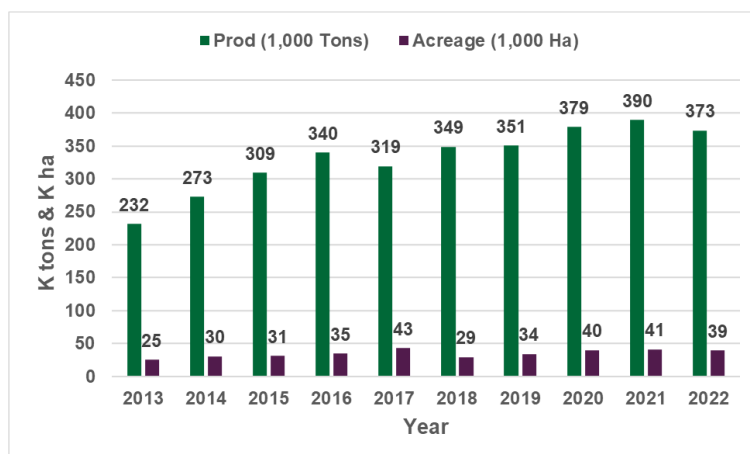
<sup>3</sup> [EAC rolls out plans for \\$900m fruit and vegetable exports](#)

<sup>4</sup> East African Community [Fruits and Vegetables Value Chain Strategy and Action Plan 2021-2031](#)

<sup>5</sup> Rwanda Horticulture Book, NAEB, 2020

**Figure 2: Vegetable use by farmers (%) - NISR, SAS A2023**

**Rwanda vegetable production is on a steadily increasing trend.** For the past ten years, vegetable production fluctuated from 231,600 tons in 2013 to 389,580 tons in 2021, increasing by 6% per year on average (Figure 3). Similarly, lands devoted to vegetable cultivation increased from 25,100 ha in 2013 to 40,800 ha in 2021, increasing by 7% per year, and the yield ranged between 7.5 tons per ha (2017) and 11.9 tons per ha (2018). In 2022, about 311,100 households produced 376,200 tons on 39,100 ha across the country, averaging 9.6 tons of vegetables per ha.



**Figure 3: Vegetables production performance (2013-2022) - NISR, agriculture SAS (2013 -2022).**

**Vegetables are consumed in rural and urban areas, with increasing demand due to population growth, urbanization, and changing consumer preferences<sup>4</sup>.** Together with other horticulture crops, efforts are being made to increase the production of exportable quality under the National Agricultural Export Development Board (NAEB). This focus on export will also likely drive increased vegetables to the local market and for home consumption through increasing the volume of ‘rejected’/not fit for export produce. Ongoing initiatives from NAEB and MINAGRI include establishing irrigated schemes, constructing postharvest processing facilities, and training farmers on production, pest control, post-harvest handling, preservation, and value-added processing techniques<sup>5</sup>. This promotion has been favoured due to growing acceptance of Rwanda’s inability to compete with neighbouring countries who have large land availability and thus can benefit from economies of scale in the production of staples such as wheat and maize.

**SHFs grow a diversity of more than 20 different vegetables across the country.** These include tomatoes, onion, white/red cabbage, carrot, eggplant, green/bell peppers, chili pepper, French bean, green pea, various leafy greens (such as amaranth, spinach, and cassava/beans/sweet potato/pumpkin leaves), cauliflower, broccoli, pumpkin, squash, garlic, leek, lettuce, beetroot, chayote, cucumber, okra, parsley, celery, snow peas, and zucchini. Some farmers also grow traditional/indigenous vegetables, such as bean’s leaves, amaranth species (dodo, imbwija and inyabutongo), isogi (Spider plant), isogo (Nightshade), amakora (Taro leaves) and intagarasoryo (Black nightshade) (Kinyarwanda’s names). Indigenous vegetables are mostly grown and consumed by elders. However, a few SMEs (Santé Plus, Amazon Nutrition Cabinet, etc.) promote them as nutritious foods, especially in urban areas.

**The six most-produced vegetables in 2022 were eggplant (89,260 tons), tomato (81,020 tons), cabbage (62,590 tons), carrot (44,800 tons), onion (41,460 tons), and amaranth (15,760 tons)** (National Institute of Statistics Rwanda (NISR, SAS, 2022)). The six vegetables accounted for 85% of the domestic vegetable production in 2022. **Error! Reference source not found.** gives a brief status of the production of the main vegetables grown across the country. They are mostly sold on the domestic and regional markets, with a few French beans exported.

**Table 1: Highlights of the main vegetables produced in Rwanda**

#	Crops	Status
1	Eggplant	African (white) eggplant is the most produced vegetable across the country. In 2022, 51,000 households produced 89,300 tons of eggplant on 8,560 ha across the country. Eggplant is relatively affordable, with retail prices between 300 and 500 FRw/kg.
2	Tomato	Tomatoes are the most traded vegetable in Rwanda, with retail prices ranging between 300 to 1,200 FRw/kg. In 2022, 37,800 farmers produced 81,000 tons of tomatoes on 10,150 ha across the country. Bugesera led tomato production in 2022, with 6,200 tons produced on 700 ha.
3	Cabbage	Cabbage is the third most-grown vegetable, with 62,600 tons produced on 4,360 ha by 62,460 farmers in 2022. Cabbage is a popular vegetable in Rubavu, with 8,600 tons produced in 2022. Cabbage prices range between 150 and 500 FRw/unit, depending on the size.
4	Carrot	Carrot is mainly grown in two districts, Nyabihu (23,200 tons) and Rubavu, with 11,850 tons produced on 920 ha in 2022. The two districts produce 78% of domestic carrot production. In 2022, 28,190 farmers produced 44,800 tons on 3,300 ha across the country. Retail prices of carrots fluctuate between 400 and 600 FRw/kg.
5	Onion	In 2022, 33,580 farmers produced 41,460 tons of onion on 4,270 ha in Rwanda. With its 24,200 tons produced on 460 ha by 970 farmers, Rubavu leads onion production in Rwanda. Onion prices fluctuate between 300 and 1,500 FRw/kg throughout the year.
6	Amaranth	Amaranth is the most-grown green leafy vegetable in the kitchen garden and the most affordable vegetable, with retail prices averaging 200 FRw per bundle. In 2022, 220,800 households produced 15,760 tons on 1,570 ha. Nyamasheke leads the production of amaranth, with 1,780 tons produced on 97 ha by 10,540 households.
8	Green peas	Green peas enjoy a high market demand, with retail prices ranging between 1,500 to 3,000 FRw/kg. In 2022, farmers produced 14,060 tons of peas on 8,800 ha across the country. Peas are a high-land crop, and Nyamagabe leads pea production, with 2,490 tons produced in 2022.
8	Sweet peppers	In 2022, farmers produced 5,560 tons of sweet peppers on 1,230 ha across the country. Sweet peppers are mainly produced for the urban market, sold at 200 to 500 FRw/unit. Last year, Ngoma produced 1,440 tons on 200 ha, accounting for 26% of the domestic sweet pepper production.
9	French beans	French beans are promoted for export, although the most significant volume is supplied on the domestic market, where they are sold at 500 to 600 FRw/kg. In 2022, 9,080 farmers produced 4,210 tons on 1,050 ha across the country. Gasabo produces the most influential volumes, with 1,700 tons produced in 2022.
10	Garlic	Garlic sells well on the domestic market, with retail prices ranging between 1,500 and 3,000 FRw/kg. In 2022, farmers produced 4,340 tons of garlic on 1,050 ha. Musanze (2,260 tons) and Rubavu (1,780 tons) accounts for 93% of the domestic production.
11	Beetroot	In 2022, farmers produced 4,350 tons of beetroot on 606 ha across the country. Beetroots are primarily produced in Kamonyi (1,380 tons) and in Rubavu, with about 250 tons produced in 2022. A unit goes for 200 FRw.

12	Pumpkin	Pumpkin is a popular crop often associated with bananas. In 2022, 21,600 households produced 9,500 tons on 940 ha nationwide. Pumpkin retail prices depend on the size (800 to 2,500 FRw/unit).
----	---------	---

Ref. NISR, agriculture statistics, 2022, E-soko prices.

**Except for a few leafy greens grown by households in the backyard to meet family food needs (amaranth, cassava/bean/sweet potato/drumstick/pumpkin leaves, and spinach), SHF grows vegetables for the market, as about 80% of the production is traded.** Vegetables are an affordable good source of vitamins, minerals, and fibre, available for all budgets, sold in the village, rural marketplaces, and urban retail markets and exported to the regional and global market. For the last ten years (2013- 2022), the value of apparent domestic consumption of vegetables increased by 136.9 million USD, from 380.7 million (2013) to 517.5 million (2022), growing by 5% per year (Figure 4).

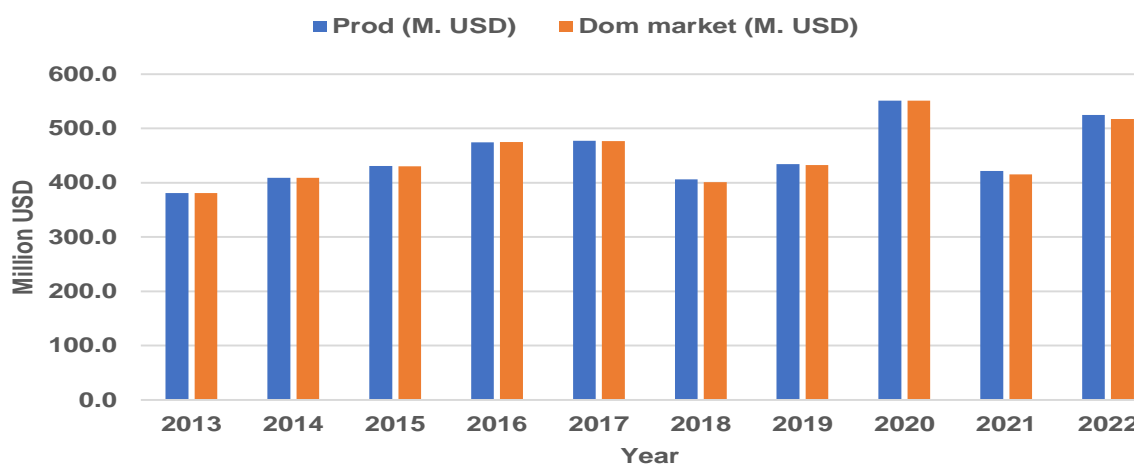


Figure 4: Veg. Prod and Domestic Market (M. USD) (NISR, RRA)

**Whilst production is high, Rwanda is still reliant on vegetable imports to meet market and consumption demands.** Rwanda imports vegetables in specific periods of the year (mostly tomato and onion from Tanzania and Uganda\_96% of total vegetable imports) to supplement the off-seasonal production shortage. Despite their low value, vegetable imports have grown by 19% per year over the past ten years, from 1.3 in 2013 to 4.7 million USD in 2022 (Figure 5). Therefore, there are some opportunities for import substitution of fresh vegetables, especially tomatoes and onions. Despite these growing vegetable imports, the country remains a net vegetable exporter, with a positive trade balance averaging 6.5 million USD in 2021-2022. Vegetable exports went from 1.8 million USD in 2013 to 11.7 million USD in 2022, growing by 53% annually. The main destination countries are DRC, UAE, Netherlands, France, and Germany<sup>6</sup>. Given the export-oriented policies and related public investments, exports are expected to keep growing in the coming years.

<sup>6</sup> NAEB (2022). [Annual Report 2021-2022](#). Retrieved June 18, 2023

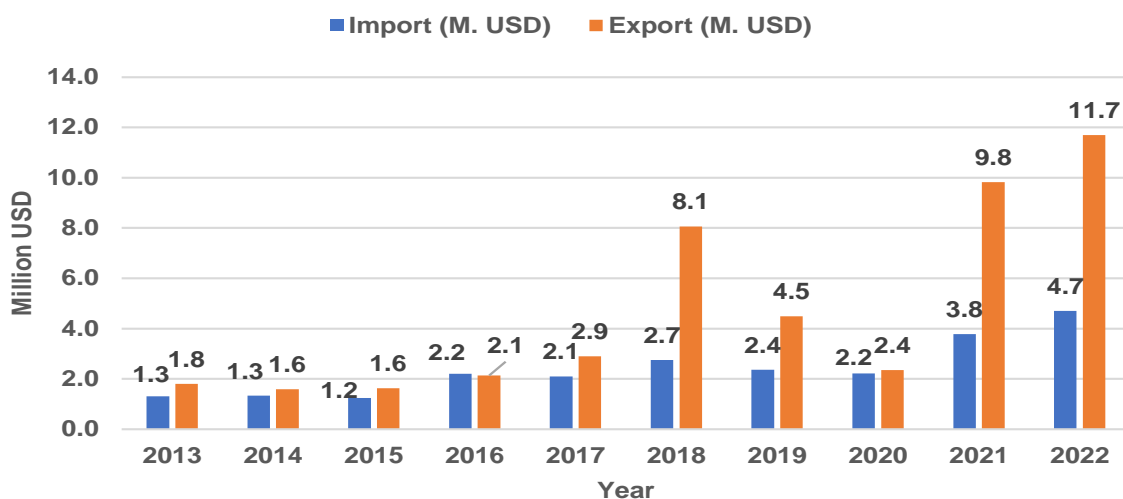


Figure 5: Vegetable Imports & Exports (M. USD)

**Rwandan vegetables are marketed both for domestic consumption and marketing and international export** (both by air freight and cross-border trade). Generally, domestic vegetable production is consumed locally, with exports accounting for 2.2% of the production in 2022. Domestic markets are supplied with vegetables by individual informal traders who collect them from the farm gate. Whilst much of this produce ends up at local and district-level markets, there is also a national network of traders and transporters who bring vegetables to larger domestic markets in Kigali, Rubavu, Rusizi, Musanze, Huye, Nyanza, Muhanga and Rwamagana. In addition to the local market, there is a significant export market for Rwanda's vegetables, both regionally (mainly DRC) and globally (EU, USA, Middle East). Vegetable export has become an important sector in the Rwandan economy and contributes about 50% of non-traditional exports to markets such as Burundi, Democratic Republic of Congo and South Sudan, as well as global destinations such as the European Union and the United States. The sector is bound to continue growing as the government continues operations under the plan for modernisation of agriculture.

**Processing of vegetables in Rwanda is limited but emerging.** Processed value-added horticulture exports have been increasing over the years. These include pineapple juice, dried pineapple, mango juice, passion fruit juice, dried and canned vegetables, and pastes like tomato and strawberry jams. There is also nascent processing for the local market, including of chilli oils and cassava leaves.

**In addition to its economic contribution, the vegetables VC offers several benefits to climate, food security and gender equity and social inclusion (GESI).**

**Several vegetables offer opportunities to promote climate resilience and create environmental benefits.** For example, leguminous vegetables such as French beans offer nitrogen fixation to boost soil fertility. Vegetables are well suited to mix-cropping to increase resilience to pests, diseases, and adverse weather conditions. Furthermore, deep rooted vegetables can be used to stabilise soil in marshland systems to protect against bed collapse. However, there are climate risks to vegetable production in Rwanda in terms of increasingly variable rainfall patterns that create droughts and flash flooding and long-term standing flood water. Intervention opportunities for adaptation and resilience include promoting climate smart agriculture practices through contract farming agreements and helping SHFs and cooperatives to invest in infrastructure such as drip irrigation and greenhouses etc. Further climate benefits can also be realised by reducing wastage in the supply chain of vegetables and improving the efficiency of processing and cold storage facilities by promoting green-energy alternatives.



**Vegetables contribute to balanced nutrition by providing an affordable source of vitamins, minerals, and fibers<sup>3</sup>.** Vegetables play an important role in human nutrition and health, particularly as sources of vitamin C, thiamine, niacin, pyridoxine, folic acid, minerals such as Iron and calcium, dietary fibre, vegetable protein and bioactive compounds<sup>7</sup>. The World Health Organisation (WHO) recommends consuming at least 400g of fruit and vegetables each day to reap their health and nutrition benefits. In Rwanda, poorer households typically utilise a higher proportion of vegetables in their daily diets in lieu of meat as a more affordable source of nutrition. Rising prices and supply volatility of vegetables is likely to undermine this coping strategy and adds to the need for interventions that help develop and stabilise local vegetable markets.

**There are also important gendered differences in participation in the vegetable market system.** In terms of production and workload, women are often left with responsibility for arduous and labour-intensive activities such as sowing and harvesting whilst men are typically responsible for acquisition and application of inputs. Historically, women have been responsible for indigenous vegetables which have primarily been used to underpin household food security. Women also dominate the domestic sale of vegetables at local markets. Several barriers remain to gender equity in the vegetables market system, namely access to land and financial resources that often prevent women from making the transition to commercial farming. There are certain crops with emerging commercial opportunities (e.g. cassava leaves) where women typically dominate all aspects of the market system. Such varieties offer opportunities for gender responsive interventions and lesson learning for promoting gender equity in the production and marketing of other vegetable varieties.

**Vegetables are gaining increasing policy support in Rwanda, with an enabling environment for growth beginning to emerge focused on export markets.** The development of the vegetable sector received a minor focus through the Crop Intensification Program (CIP) in its inception phase in 2007 - 2012<sup>8</sup>. It was only in 2014 that the sector attracted interest when the National Agricultural Export Board (NAEB) developed the National Horticulture Policy and Strategic Implementation Plan<sup>9</sup>, making horticulture the primary driver of agriculture exports for coming years - especially to the global market. This focus has three primary justifications. Firstly, NAEB were keen to diversify Rwanda's exports to reduce over-reliance on the two main traditional export crops; tea and coffee<sup>10</sup>. Secondly, focusing on high-value crops such as vegetables was seen as preferable for a land-limited country such as Rwanda which is unable to compete with its larger neighbours on commercial staples production (wheat, maize etc.). Thirdly, vegetables offer a good option as a season C growing crop and can provide several benefits for the land in terms of rotation and nutrient cycline (especially legumes such as french beans). A more in-depth summary of relevant policies is given in section 3.4.1 of this report.

### 2.3. CASA Focus Regions

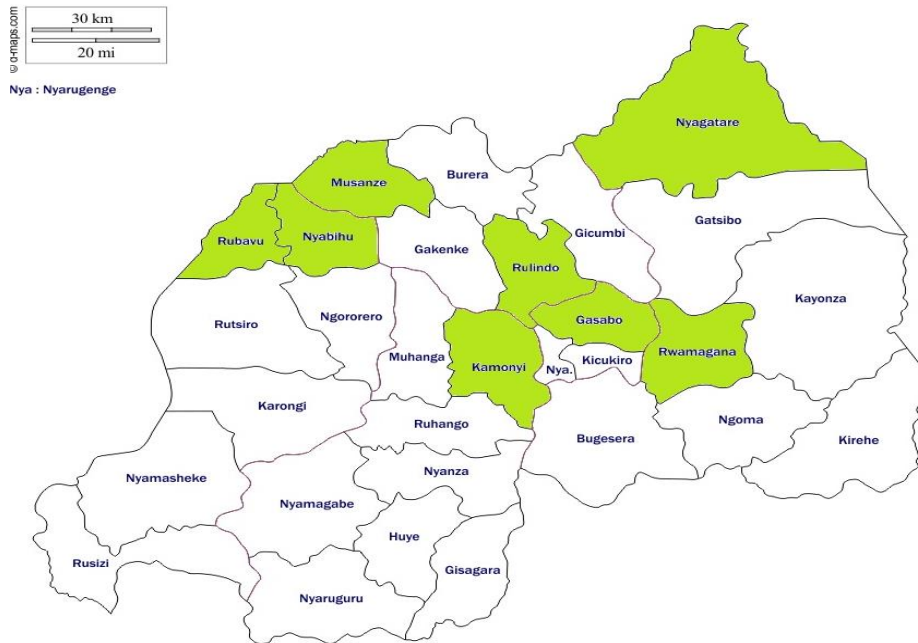
**Whilst vegetables are produced throughout Rwanda, there are several districts where proximity to market, land availability, and environmental conditions have led to significantly higher production.** In 2022, eight (8) districts produced 50% of the domestic vegetable production 2022, with at least 15,000 tons of vegetables each (**Error! Reference source not found.**6). Rubavu district leads vegetable production, with 55,040 tons produced in 2022, accounting for 15% of the national veg production. Nyabihu comes in the second position, with 27,020 tons produced in the same year. The two districts produce more than a fifth (22%) of the domestic vegetable production.

<sup>7</sup> FAO (2019). [Food Composition database](#). Retrieved May 19, 2023

<sup>8</sup> Horticulture (including vegetables), is among the priority "crops" that have been promoted by the CIP since its inception in 2007. However, the major focus has been put on maize, vegetables receiving minor efforts.

<sup>9</sup> NAEB (2014). [National Horticulture Policy and Strategic Implementation Plan](#). Retrieved June 10, 2023

<sup>10</sup> NAEB (2022). [Annual Report 2021-2022](#). Retrieved May 18, 2023



**Figure 6: Top Eight (8) Vegetable-producing Districts (above 15,000 T/Yr.) Ref: (NISR, SAS, 2022)**

Rubavu leads the production of onion (24,200 tons), carrot (11,860 tons), and cabbage (8,600 tons), while Nyagatare is among the top producer of tomato (6,020 tons) and pumpkins (3,230 tons). Although vegetables are produced in each district, the bulk vegetable production comes from two major areas,

1. The North-western region (Rubavu, Nyabihu, and Musanze on volcanic soils). Areas like Bazirete (Rubavu) and Mukamira are well known for their high and year-round production of onion, carrot, beetroot, garlic, cabbage, and leek—vegetable farming benefits from steady heavy rain and fertile soil.
2. Kigali neighborhood (Rwamagana, Gasabo, Kamonyi, Rulindo, Bugesera, Kayonza, and Nyagatare), supplying fresh vegetables to Kigali and export markets. The districts in Eastern Province lead tomato production, the country's most traded vegetable.

Product from the main producing regions is distributed across the country to local, regional, and international markets through a network of traders, transporters, and marketers (both individuals and companies). These relationships are further documented in section 3 of this report.

**Despite current concentration in the above-mentioned regions, vegetable production is being stimulated across Rwanda.** Government of Rwanda efforts in establishing many small-scale irrigation systems across the country are increasing the number of farmers interested to invest in vegetables farming, due to increased access to water and other facilities required for vegetables production. Most farmers using these irrigation systems are organized in cooperatives, farmers' groups, water user associations and schemes. There are companies and SMEs who either process or export vegetables linked with farmers through these irrigation schemes. The organized production emerging around these irrigation schemes presents high potential for CASA to utilize its MSD approach to support the development of a functional vegetable market system in the country and to generate income for many people, enhance food security, and nutrition and climate resilience.

**CASA interventions will initially focus on the two regions of concentrated vegetable production mentioned above.** There are two key reasons for this. Firstly, as CASA's primary aim is to deliver benefits for SHF producers and increase their climate resilience (majority of opportunities at production levels), it makes sense to focus efforts on the main production regions. Secondly, the distribution of partners, especially producer cooperatives and processors, is largely skewed towards these production regions. Despite this regional focus, it is important to note that the small size and well-connected nature of the separate regions of Rwanda means that other key actors in the market system, such as local and national markets, traders and transporters, export locations (predominantly Kigali area), and financial institutions, typically have national coverage and so will also be applicable to interventions should this be required. Working nationally will also be important in recognizing the importance of vegetables and their potential to deliver food security and climate benefits throughout the country, scaling of initial activities will look for opportunities to improve the production and marketing of vegetables in other districts where production is currently low.

### **3. Market System**

The purpose of analysing the system is to define how smallholder farmers are currently engaging with (or buying and selling) core products or services within the system, and how the supporting functions and regulatory environment influence this core exchange or transaction. The sector map is the output of the system analysis process that starts to define the existing system and enables a better understanding of system actor relationships and dynamics including identification of key constraints, opportunities, and information gaps.

#### **3.1. Sector Map**

The sector map (Figure 8) is the output of a system analysis process that starts to define the existing vegetables market system and enables a better understanding of system actor relationships and dynamics including identification of key constraints, opportunities, and information gaps. The map is comprised of the core market in the centre, supporting functions below, and the formal and informal rules that govern the market above.

## Rwanda vegetables market map

**Core market actors:** Input providers; seed multipliers and nurseries; SHFs (large and small); Cooperatives/farmer groups; Traders and aggregators; International exporters; Regional exporters; Processors; Retailers; Fresh markets (regional, Kigali, local); High value domestic market International buyers; Consumers

### Challenges:

- Availability and cost of inputs can be prohibitive for SHFs, leading to use of landraces which have poorer yields. Farmers are not fully aware of cost of production so often make a loss (lack of entrepreneurship skills).
- Poor organisation of SHFs and knowledge of how to run a successful coop.
- Research and development in vegetables is failing to reach SHFs, this includes opportunities for basic processing such as drying.
- Small plot sizes of many SHFs limits economies of scale and realisation of profit.
- Climate change (drought and flooding) is reducing yields.
- Poor organisation of SHFs – many are distrusting of cooperatives so opt to produce and market individually. This also reduces ability to invest.
- Farmers often produce without a secure market, creating high financial risk.
- Where contracts are absent, traders take advantage and provide low prices based on seeing plots, not weight.
- Where contracts are used, they are often not binding on prices/quantities.
- Market demand and price is highly volatile due to seasonal production.
- Lack of storage options and cold chain leads to high post-harvest losses on farm, in transit and also at fresh markets.
- High cost of production in Rwanda is a disadvantage compared to neighbouring countries (Tanzania and Uganda) – imports are often favoured for this reason.
- The processing sector is under developed, with relatively few companies operating in Rwanda and lack of forthcoming investment.

### Opportunities:

- Much of the vegetable production in Rwanda employs conservation agriculture and regular rotation as well as intercropping with household food crops or agroforestry trees, scaling this is an opportunity to address climate objectives.
- There are examples of successful and equitable outgrower schemes that provide income benefits for SHFs – these could be scaled and replicated.
- Financial institutions being encouraged by GoR to engage with agribusiness; several products are now available but uptake is currently low.
- Physical infrastructure in Rwanda is generally very good, facilitating domestic and international transportation.
- Where stable markets can be found, vegetable production can provide substantial income opportunity for SHFs.
- Existing successful processing companies require investment to help increase their capacity and therefore bring more SHFs into their supply chain.
- There are a handful of educated youth entrepreneurs who are commercially minded and willing to invest in their agriculture looking for market linkages.
- There is a growing international demand for vegetables, this is supported as a policy priority by GoR, linkage services between SHFs and exporters by independent service providers can help facilitate transactions.

### Knowledge gaps:

- Data on quantities and value of SHF production of specific vegetable crops is hard to acquire, especially for the domestic market.
- Exact size of export market and willingness of exporters to engage equitably with SHFs providing fair contracts and reliable markets.
- Legal status of some cooperatives and ability to take on investment and negotiate contracts with vegetable traders and exporters.

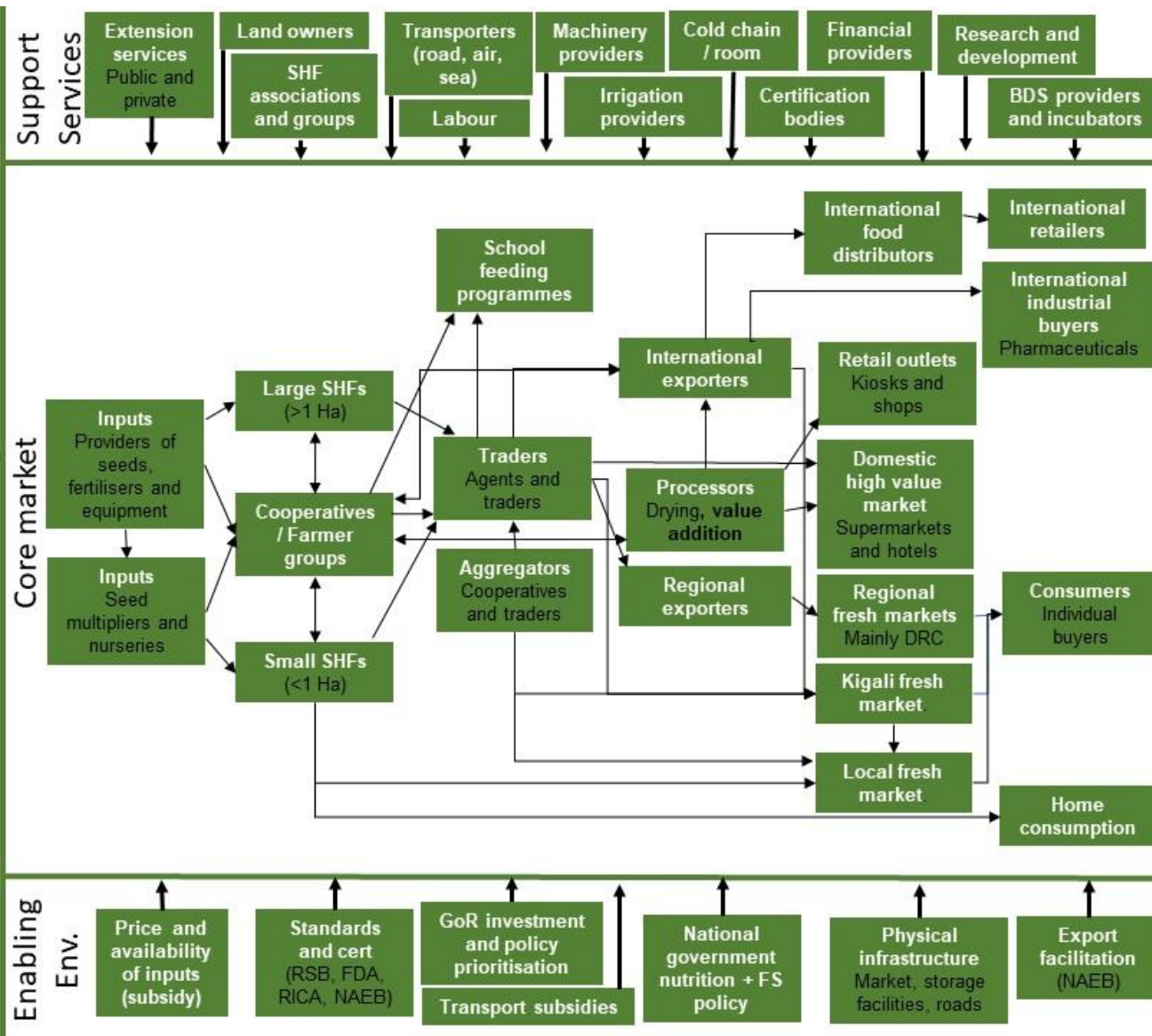


Figure 7: Market map for the vegetables value chain in Rwanda based on participatory workshop, literature review and KILs

The high volume of connections between actors on this map highlights the lack of organisation in the vegetables market system which means that, rather than having distinct roles, many actors fulfil a variety of functions. The relationships between these actors and the challenges and opportunities they face is explored in detail in sections 3.2 – 3.4.

## 3.2. Core Market Functions and Actors

**The core market depicts all the transactions and linkages through which the primary product is produced and reaches the final consumers.** For vegetables in Rwanda, the core market broadly includes input suppliers, producers (small SHFs and larger SHFs as well as cooperatives/farmer groups), aggregators, traders, processors, exporters (regional and international), markets (local fresh, regional fresh, domestic high value, and international) and consumers (commercial buyers, individuals). All these key actors in the vegetables market system are entrepreneurs who conduct business enterprises at different levels and through distinct manners in a fragile and unstable entrepreneurial environment. Many of them operate their businesses informally while few are formal.

The sections below provide specific details at each stage or function of the core market value chain.

### 3.2.1 Input Supply

**The cost of improved vegetable seeds is high as they are mainly imported; as such, SHFs often rely on landraces that give lower quantity and quality produce.** For traditional vegetables, the farmers keep seeds from their previous harvest (eggplant, amaranthus, spinach, tomatoes, garlic, onions etc.). SHFs buy imported seeds both individually and collectively from over 1,500 agrodealers scattered across the country for exotic vegetables like tomatoes, carrots, and onions.

**Commercially, most vegetable seeds come from the Netherlands and are then multiplied either in Rwanda or regionally, with two companies leading the market** (Agrotech and Holland GreenTech), with emerging companies such as Agriseeds Ltd also present. Although agrodealers display quality inputs (seeds, fertilizers) and chemicals to control pests and diseases, they experience low demand for these products and keep their stocks small, as farmers have low interest and financial capacity in sourcing quality inputs for production. Besides private inputs suppliers, the government of Rwanda and non-governmental organizations like SNV, CNFA, TEARFUND and OXFAM, through various development programmes provide subsidised and/or credited input supports to farmers.

**Exporting and processing companies such SOUK Farms Investment, Urwibutso Enterprise and One Acre Fund directly import their own inputs (seeds and equipment) to gain favourable prices and undertake quality assurance.** Where SHFs are connected to professional exporters via outgrower schemes, production is often facilitated by access to inputs on credit-based system. Initially farmers will trial the seeds then, if successful, they and their neighbours will typically look to scale up production with new seed varieties which are deemed worthy of investment

**Chemical inputs are often a large portion of the up-front investment cost in vegetable production, with the need for pesticides increasing as diseases and pests become more prominent due to climate change.**<sup>11</sup> In general, pest and disease management is poor in Rwanda, with a 2018 Rwanda Agriculture Board review suggesting opportunities for integrated pest management (IPM) to significantly reduces yield losses from pests and help combat their

---

<sup>11</sup> Accelerating Rwanda's Food Systems Transformation

increasing presence as climate change continues to progress.<sup>12</sup> SHFs spoken to in the field indicated awareness of climate change exacerbating the presence of pests and disease; however, they also expressed a lack of knowledge on how to combat this issue. IPM practices offer an opportunity to address the pest and disease issues whilst also reducing SHF reliance on pesticides and fungicides, reducing the economic burden of crop protection and avoiding environmental damage that can emerge from poor chemical application practices.

**Access to mechanical equipment amongst SHFs is low, limiting production.** Vegetable producers also need mechanisation between June and July (season C) to prepare land for the off-season vegetable production. However, smallholder farmers remain over-reliant on manual labour, which is less efficient and requires the timely availability of labour. Low mechanisation is a result of the following constraints: smallholder farmers cannot afford investing in their own mechanised equipment; fragmented and small land size increase transaction costs for tractor service providers, hindering the business case to offer services to smallholder farmers and; there are a limited number of tractors and service providers available in the country.<sup>13</sup>

### 3.2.2 Production

**There are three main vegetable producing seasons in Rwanda.** Rwanda is characterised by a highly productive agriculture sector, which benefits from a bimodal rainfall system. The first rainy season, or Season A, extends from September to December, and the second season, or Season B, starts in March and ends in May<sup>14</sup>. In the marshlands and other permanently irrigated spaces, where water is quasi-permanent, there is a third agricultural season for vegetables, season C, from June - August. SHFs working in these marshlands are often better organised due to the necessity of organisation to managing water resources. In such areas, cooperatives intervene in water management and bulk sales of vegetables.

**General attitudes to vegetable production have been shifting as a result of government promotion.** In the past, farming vegetables especially amaranth and other types of vegetables was assigned to women at household level, because they were responsible for feeding children and dealing with food cooking. Vegetables were considered as secondary and supplementary foods to accompany cereals, tubers, and beans. The time has come to shift from that understanding, from when people started to realise that vegetables are very important in food security and nutrition. Now, vegetables are among cash crops which enable people to generate incomes through sale for export and at local markets. Women farmers continue to dominate the traditional vegetables sector from production to marketing.

**Vegetable production in Rwanda is dominated by SHFs. As plot size has significant implications for production costs, it is important to differentiate between 'large' and 'small' SHFs.** About 311,000 households (14% of the total households involved in agriculture) produce vegetables in Rwanda, women representing 56.6%<sup>15</sup>. In Rwanda, SHFs account for about 70% of the farmers' population. Whilst there is no disaggregated data on numbers in each category, it is important to note that vegetable SHFs in Rwanda have highly variable land holdings. For example, many farmers operate on less than 1Ha of land (a product of generational division of family lands) whilst others have larger holdings (1-5Ha) and others are emerging commercial producers with between 5-10Ha (typically leasing at least 50% of this land and employing both permanent and seasonal labourers).

**In general, vegetable SHFs in Rwanda are poorly organised, limiting their ability to coordinate production and access services.** The Rwanda Cooperative Agency (RCA) lists

<sup>12</sup> [Rwanda Pest Management Plan, Final Report, 2018](#)

<sup>13</sup> [IMSAR Completion Report](#)

<sup>14</sup> CIAT, 2019

<sup>15</sup> NISR, 5<sup>th</sup> Population and Housing Census, 2022

253 cooperatives of vegetable producers. According to RCA, less than 15% of vegetable producers are cooperative members since they grow other crops and thus are not necessarily registered in “vegetable cooperatives”. This reflects a broader distrust of cooperatives across Rwanda, where many SHFs opt to produce and sell individually.

**In general, cost of production for vegetables in Rwanda is high, limiting income generation.** The causes include the low yield (compared to the potential), the increased losses experienced due to poor pest management and post-harvest handling, the inefficiency of manual labour, the high prices of quality inputs, and low-grade products (undersized damaged or misshapen).

**To combat the challenges created by small plots, public and private solutions are increasingly being adopted.** In Rwanda, land use consolidation was implemented in 2008 with the overall goal to overcome the effects of land fragmentation by increasing the scale of agricultural yields and stimulating a transformation to a competitive and market oriented agricultural sector<sup>16</sup>. It is also used to improve the rural infrastructure and to implement the developmental and environmental policies. This is particularly evident in marshlands, which are government owned and leased by individual SHFs, typically organised into cooperatives to manage the land (irrigation and lease). Privately, SMEs and agricultural entrepreneurs (often educated youth) are consolidating land through purchase or leasing arrangements to benefit from economies of scale and produce larger quantities of vegetables.

**Climate change is likely to increase seasonal variation in production, leading to increased market volatility.** There are three growing seasons for vegetables in Rwanda and limited off-season production, which is a primary cause of market volatility; this will be exacerbated by climate change. There is need to look at how to mitigate this using technology to extend the growing season, including irrigation and/or use of greenhouses for year-round production e.g., Western Province. Frequent rain shortages and floods (both flash flooding and standing flood water) destroy vegetable farms and deplete soil fertility, leading to increased dependence on external fertilizers to provide the crops with the required nutrients. Climate change and a lack of good agricultural practices are increasing the incidence of pests and diseases, requiring increasing use of pest and disease control management practices and products. Therefore, producing vegetables requires a continuous water supply through irrigation, with farmers often relying on inorganic fertilizers for optimized growth and spraying pesticides to control pests and diseases in the absence of operationalizable knowledge on IPM. Although the level of fertilizer application is not yet alarming in Rwanda<sup>17</sup>, some pesticides are decried to generate negative environmental impacts<sup>18</sup>, like killing bees and other beneficial insects. Significant opportunities exist around the promotion of climate smart agricultural practices amongst vegetable farmers in Rwanda.

**Resilient farming practices for climate and food security are seen amongst some of the more technically proficient farmers but are not widespread.** Adapting to climate change requires the adoption of climate-smart agricultural (CSA) practices, access to climate-resilient crop varieties, and better soil health and water management strategies. Various stakeholders are aware of the challenges of climate change and are taking steps to address them. The GoR developed large irrigation schemes, established bench terraces for erosion control, and is improving access to irrigation equipment through Small-scale Irrigation Technologies (SSIT) such as drip-kits. Besides, development partners train farmers on climate-resilient farming practices, including managing water resources and using renewable energy in agriculture. Given the current land limitation, the state of hillside fragile soils, and recurrent severe climate conditions, farmers will have to adopt climate-smart vegetable production practices. These

---

<sup>16</sup> MINAGRI, 2009

<sup>17</sup> REMA (2016). [Effectiveness and Efficiency of Fertilizer Use in Rwanda](#). Retrieved May 18, 2022

<sup>18</sup> ARECO Rwanda Nziza (2020). [Highly Hazardous Pesticides \(HHPs\) Rwanda Situation Report](#). Retrieved May 18, 2023

include conservation agriculture to enhance soil health, reduce erosion, and increase water retention (minimizing soil disturbance, maintaining a permanent soil cover, and practicing diverse crop rotations), promotion of agroforestry, mix-cropping and crop rotation. Mix-cropping and rotation are already widely present amongst many of the SHFs interviewed as part of the data collection for this report.

**Irrigation can significantly improve production but is often prohibitively expensive for SHFs given their small plot sizes; however, a range of public and private solutions are emerging.** GoR 4,000ha irrigation scheme to attract investment<sup>19</sup>; service providers taking irrigation equipment from farm to farm<sup>20</sup>. In Rwamagana District, SAIP initiated a well-established small scale irrigation marshland-based scheme for 215 ha involving three sectors of Mwirire, Nzige and Rubona. Most farmers who exploit the scheme are grouped in GWIZA Cooperative with current membership of 820 farmers. The main cultivated vegetables are chilli, French beans, tomatoes, black eggplants, broccoli, and cucumbers. Besides the cooperative, the users of the scheme are in water association which is responsible for the water management and irrigation system maintenance.

**There are gendered and social inclusion dynamics at play in the production of vegetables in Rwanda.** Although all actors work in land preparation, sowing, and weed control are generally activities for women. Generally, men tend to dominate capital-intensive activities (machinery use, input application), young men are more present in heavy workloads, and women undertake low-rewarding and time-consuming activities. Young men dominate pest and disease control (spraying), transportation using bicycles and motorcycles (while women carry the harvest by head) and loading and unloading activities. Large aggregators linking rural areas with urban markets are mainly men, and vegetable retail is dominated by women. On average, female-managed farms are estimated to be 12% less productive than male-managed farms due to lower expenditure on fertilizers and insecticides (female farm managers spend 35% less on these inputs than farms managed by men and are thus good potential targets for organic GAP interventions<sup>21</sup>). As previously mentioned, there are also gendered crop preferences, with production of traditional vegetables such as cassava leaves dominated by women, with processors such as Shekina emerging as reliable off-takers.<sup>22</sup> This reflects efforts from the Government of Rwanda to improve vegetables consumption for nutrition purpose through homestead gardens programmes by which all households have been sensitised to farm vegetables in small plots near the households. Women are the principal managers of these homestead gardens.

**Most vegetable production by SHFs is market driven, responding to what they think can achieve the best price for.** SHFs often experiment with multiple crops, diversifying their plots to increase resilience to both climate and market fluctuations. Ultimately, if a crop performs well, they will choose to plant additional in the following season. However, this is not always the case, with some farmers planting with poor organisation and no linkage to certain markets, relying on informal connections to local markets. It is also important to note that planting and harvesting times influence market performance, for instance the first harvest of egg-plants in a season may fetch higher prices than the second and third when more egg-plants are available.

### 3.2.3 Distribution, Aggregation, Processing, and Marketing.

**Significant markets exist for Rwandan vegetables both domestically and internationally; current supply cannot meet demand** (See Table 2 below). For example,

---

<sup>19</sup> KII with PSF Ag.

<sup>20</sup> KII with OAF

<sup>21</sup> MINAGRI (2019). [Gender and Youth Mainstreaming Strategy](#). Retrieved May 25, 2023

<sup>22</sup> Taremwa, Mukakamari and Butera, 2017, [Enhancing the Livelihood of Rural Women through Indigenous Vegetable Production Around Volcanoes National Park in Rwanda](#)



One Acre Fund suggests they have a market of 300MT per season for Chilli but are unable to meet this demand due to a lack of production (currently have access to 150MT) which is linked to a lack of trust from SHFs due to failed chilli contracts in the past. In another example, it is suggested there is an annual garlic demand for export (food and pharmaceuticals) of 100,000MT per year (Got It and IMARB), which is significantly under fulfilled (data unavailable).

**Vegetables can offer a significant income opportunity for SHFs when yields are good, and markets are available.**

**Table 2: Estimated income potential for SHFs in the key vegetables in Rwanda<sup>23</sup>**

Crop	Average investment requirement /ha	Average yield /ha	Price /kg to farmer	Expected rejection rate (%)	Overall return to farmer/ha	Possible net profit /ha
Chilli	\$ 5,989	9.8 Mt	Dry Red = \$1.6-\$1.8	-	\$ 9,691 - \$ 11,651	\$ 3,702 – 5,662
	\$ 4,706	14 Mt	Fresh Red = \$0.42 - \$0.68	5%	\$ 5,880 – \$ 9,520	\$ 1,174 – 4,814
Garlic	\$ 4,171	7,5 Mt	\$1 – \$1.5	5%	\$ 7,500 – \$11,250	\$ 3,329 - 7,079
French beans	\$ 3,208	9 Mt	\$ 0.51 - \$ 0.55	5%	\$ 4,590 – 4,950	\$ 1,382 - \$ 1,742
Onions (Fresh vs dried)	\$ 4,705	30 – 40 Mt	Fresh onions = \$ 0.34 - \$ 0.5	5 - 10%	\$ 10,200 – 20,000	\$ 5,495 – 15,295
	\$ 7,058	21 – 28 Mt	Dried onions = \$ 0.5 - \$ 0.68	5%	\$ 10,500 – 19,040	\$ 3,442 – 11,982
Cassava leaves	\$ 19	1.646 Mt	\$ 0.06	-	\$ 98.8	\$ 77.8
Tomatoes	\$ 3,425	16.5 Mt	\$ 0.28	5%	\$ 4,591	\$ 1,166
Egg plant	\$ 898	8,438 Mt	\$ 0.20 - \$ 0.25	5 - 10%	\$ 1,688 – 2,110	\$ 790 - 1,212

<sup>23</sup> Note that these figures are averages attained from farmers and other experts. All figures are subject to seasonal and annual fluctuations in both production and market conditions.

**Price for vegetables in urban areas has continued to increase since 2022 due to prolonged drought that affected some parts of the country especially Eastern Province and parts of Southern province.** The Consumer Price Index showed that vegetables increased by 11.8 percent in the same year, farmers and consumers suggesting long term solutions to avoid this issue by investing in irrigation technologies to improve length of production periods as well as storage technologies/facilities to conserve vegetables for a long period and reduce volatility of supply<sup>24</sup>.

**Despite potential, post-harvest losses pose a significant threat to the commercial viability of vegetable production in Rwanda.** This is a particular issue in peak growing season, where storage capacity is inadequate for production levels and markets are oversupplied, often meaning slower sales. In addition, there is a lack of improved techniques and practices applied in post-harvest activities including drying, sorting, and grading for most vegetable products. This leads most farmers to withdraw from some crops over other vegetables and thus affecting the supply of produce to the market. Farmers and aggregators have low interest in investment in post-harvest technologies and infrastructures due to volatile and unpredictable markets. This leads to high post-harvest losses/spoilages (20 to 50% of the vegetables are lost between the farm and the end-consumer in Rwanda)<sup>25</sup>. Addressing these losses is a significant opportunity to improve economic and environmental efficiency of the supply chain. Additionally, the seasonal nature of production and lack of year-round production techniques and/or adequate storage options means that prices of vegetables on the domestic market in Rwanda is highly volatile. Farmers and SMEs refer to the benefits attainable by stabilising production through storage facilities (cold rooms) or processing (drying for powders) but are often unable to access sufficient credit and/or reluctant to take the financial risk on an unstable product.

**Domestically, there are several routes to market for vegetables:**

- **Many vegetables are provided to the local market via traders.** Small collectors walk through the village collecting 10 to 50 kg of certain types of vegetables (French bean, tomatoes, eggplant, etc.) that they deliver to aggregators at the nearest (bi)weekly market. High-production areas (like Bazirete in Rubavu) have developed vegetable collection centres where farmers can provide their harvests daily. Farmers and collectors also deliver fresh vegetables to retailers (the majority of whom are women, who typically make a mark-up of 100 RWF/kg of produce sold) or households in urban areas. The number of these small players collectors is unknown, and their business is seasonal. Retailers are well established, but stay small, purchase, and sell vegetables daily and discount the unsold quantity at the end of the day to limit the losses. These traders also work nationally; for example, tomatoes and French beans are not grown in the highland regions (Musanze, Nyabihu, Burera and Rubavu) due to climate conditions and therefore are source mainly from Eastern and Southern provinces. It must be noted that engaging individually with such traders leaves SHFs with minimal bargaining power, with many reporting low process negotiated by a visual appraisal of the plot or per bag (of varied and unspecified weight) rather than an agreed price per kg.
- **The Kigali Wholesale Market (KWM) is envisioned to transform domestic fresh produce marketing in Rwanda; however, it is still a long way from being realised.** Funded by EU, GoR supporting infrastructure, market produce will be aggregated here from SHFs and then sold to private and public buyers both domestically and internationally. There is an opportunity for CASA to build upon the work and investments of FCDO-funded

---

<sup>24</sup> New Times, 2022, [Why have vegetable prices increased by 11% in Rwanda's urban areas?](#)

<sup>25</sup> UCDavis (2018). Postharvest Loss Assessment of Tomatoes in Rwanda. Feed the Future Innovation Lab for Horticulture. Retrieved May 19, 2023

IMSAR to ensure that the KWM realises its potential to transform the vegetable market system.

- **In addition to local markets, high-value domestic markets are present.** Some companies specialise in serving the high-end domestic market (better-off households, caterers, hotels) with high-quality vegetables. They often work closely with farmers, ensuring adherence to quality standards, and handle the logistics from the farmers to the end consumers. Examples include [Get it Rwanda](#) and [Izere Services and Trading Co Ltd](#). Despite the opportunities for income, the high value market in Rwanda is relatively small and often characterised by informality and 'who you know'. School feeding programme from the GoR is more reliable, with the policy being for every child to have 100g of vegetables per day.
- **Commercial contracts are available domestically, for instance for school feeding programmes.** In the current supply model, schools are responsible for contracting food (including vegetables) suppliers. But there is a process of reviewing this model so that a consolidated supply model will be adopted to enable one supplier to be responsible for different schools in the same region, which will ease the supply of same products at the same price and quality within the same region<sup>26</sup>.

**The export market is a policy priority in Rwanda as it is generally higher value and more stable (larger order volumes per buyer) than the domestic market; however, exporters face several challenges:**

- **The number of exporters is growing.** According to RDB, 55 companies have been registered for horticulture export investment and activities and 45 companies are in vegetables export. It should be noted that many of these companies are small and/or dormant due to operational challenges. Optimistically, there are no more than 10 companies that are doing professional and large-scale vegetable export from Rwanda. These companies export several varieties, including chilli (fresh and processed), French beans, pepper, onions, carrots, and snow peas. The main destinations are UK, European Union, USA, Middle East, China, and India. In addition, thousands of informal cross-border traders (mostly active with the DRC borders in Rubavu and Rusizi).
- **One of the most significant challenges for exporting SMEs is SHF engagement.** Where SMEs have engaged SHFs they often employ a very light touch, only seeing them to provide seeds and harvest. For more effective production to meet standards and quality, SMEs should look to engage SHFs more regularly throughout the production season. This is the approach taken by larger SMEs such as Urwibutso Enterprise, PEBEC, SOUK Farms Investment, BAHAGE Food Ltd, Garden Fresh Ltd, Gashora Farm PLC, Aproxifarm Ltd, etc. When SMEs do not have the inclination or the capacity to undertake this farmer supervision, they can enlist the support of brokers such as One Acre Fund, who handle the SHF management. The level and type of engagement in business partnerships and deals between farmers and companies (processors and exporters) still face the challenge of not being formalised effectively. The majority of relationships are informal and based on trust and are done verbally with few formal interactions supported by either contract farming or purchase orders.
- **Export SMEs also commonly face issues regarding cash flow.** As export markets are often slow to pay out, many exporters suffer from a lack of liquidity. As a coping mechanism, some look to float their rejections on the local market for increased cash flow.
- **Contracts between SHF producers and SMEs are characterised by a lack of professionalism from both sides and a subsequent lack of trust.** Exporter contracts are often inconsistent, not followed through (exporters offer lower price or farmers sell elsewhere). Contract abuse by SMEs creates legacy issues for certain crops, such as Chilli and Garlic, where large markets were promised only to fall through after harvest, leaving farmers with large quantities of produce and no markets for it. These legacy issues affect

---

<sup>26</sup> Interviews with Agrilec Ltd in Kayonza District

SHF willingness to participate now, meaning the building of trust is essential for any market linkage intervention. Over the past decades, the GoR and development partners' efforts have been pushing to establish contract farming between potential buyers of export vegetables like green peas, French beans, and chili pepper with farmers while investing/subsidizing production and post-harvest infrastructures. Except for a very few early adopter farmers, the farmers-exporters collaboration was slow to take off. Often, the farmers failed to produce the required quality/quantities, or the exporters/buyers didn't come to pick up the production at harvest time. Currently, most vegetable producers depend on the spot market, experiencing high price fluctuations and high rates of losses and unsold vegetables<sup>27</sup>.

**Table 3: The volume of vegetables sold, and the generated revenues from July 2021 – June 2022 (reported by NAEB, 2022)**

Selected vegetables	Sold volumes (Kgs)	Revenues (USD)
Chilli	1,820,668	5,863,083
Garlic	-	-
French beans	973,464	2,952,602
Onions	2,613,483	1,138,606
Cassava leaves	-	-
Tomatoes	6,159,057	6,819,961
Egg plant	2,730,574	831,083

**Whilst export markets are the policy priority, the impact of this promotion on domestic vegetable availability must be considered.** The effects of export promotion on domestic markets are well summarised [2013 article by Thow and Priyadarshi](#), who state “another concern is that a greater supply of fruits and vegetables could step up exportation at the expense of local fruit and vegetable consumption and local food security. Research on agricultural food systems in developing countries shows that farmers who participate in modern food supply chains also participate in traditional food systems. As a result, trade-related investment in technologies and infrastructure that reduce post-harvest losses is also likely to improve food availability in local markets. In addition, agriculture-based economic growth has been shown to accrue to the poorest much more than growth in the non-agricultural economy. Hence, improvements to agricultural productivity and supply and reductions in post-harvest losses are likely to improve food security, even among poor farmers. However, it will be important for the health and agricultural sectors to implement additional policies when needed to promote and support food security. From a health perspective it is also important to consider the environmental implications of increasing fruit and vegetable supply and trade. Although the food trade generates carbon emissions through “food miles” (food transport), production by smallholders in developing countries using less sophisticated technologies is likely to generate a smaller carbon footprint than some locally produced foods. Transport has a smaller impact on the environment than production-related activities.”

**Despite growing production, Rwanda continues to import vegetables in specific periods to supplement off-seasonal production shortages.** Imports are mainly tomato and onion from Tanzania and Uganda (96% of total vegetable imports). Despite their low value, vegetable imports have grown by 19% per year over the past ten years, from 1.3 in 2013 to 4.7 million USD in 2022. Therefore, there are some opportunities for import substitution of fresh vegetables, especially tomatoes and onions. Despite these growing vegetable imports, the country remains a net vegetable exporter, with a positive trade balance averaging 6.5

<sup>27</sup> Kubwimana JJ. (2020). [Risk Analysis of Vegetables Marketing in Rwanda. A case of carrots and cabbages produced in Rubavu District and supplied across the country](#). In Journal of Agribusiness and Rural Development 56(2). Retrieved May 20, 2023

million USD in 2021-2022. Vegetable exports went from 1.8 million USD in 2013 to 11.7 million USD in 2022, growing by 53% annually. The main destination countries are DRC, UAE, Netherlands, France, and Germany<sup>28</sup>. Given the export-oriented policies and related public investments, exports are expected to keep growing in the coming years (see fig. 5 above).

**Packaging materials, particularly important for export markets, are often imported and therefore expensive, though some alternatives are emerging.** Packaging for the export market primarily takes place at the NAEB pack house, which, despite expansion in 2020, remains inadequate for demand. Packaging is more troublesome for the domestic markets; as it is not an essential requirement, it is often not present or inadequate, leading to high losses in transportation. Currently, many cooperatives and SHFs use rudimentary field packing techniques using traditional woven baskets which offer minimal protection from damage in transit. A range of packaging alternatives are emerging with some SMEs in the special economic zone working under the 2022 packaging strategy from MINICOM to produce biodegradable packaging including vegetable nets and corrugated boxes<sup>29</sup>. Additionally, several cooperatives have trialled various packaging techniques for vegetables; however, none of them have been scaled commercially. As such, there is an opportunity to look at improved and environmentally friendly packaging options for vegetables to reduce losses in transit.

**Vegetable processing is currently underutilised in Rwanda, mainly because of requirement for upfront capital investment and competition from foreign imports.** The vegetable processing industry in Rwanda is in the early stages of development and primarily limited to sorting and/or freezing/drying for storage rather than any meaningful value addition. The few examples of value addition include the production of chilli oil, soups and sauces (e.g., tomatoes) and dehydrated cooked products such as the isombe made from cassava leaves by Shekina.

**Where processing does exist, it is often under-capacity and/or inefficient.** Examples include Urwibutso Enterprise (Chilli), Gashora Farms PLC (Chilli) and Shekina Enterprise (Cassava leaves). Underutilisation is primarily driven by difficulties in acquiring enough quality raw materials that emerge from challenges in engaging farmers to produce to a required standard (for traceability, trading standards etc.). In addition to underutilisation, several processing plants are inefficient, currently running off of non-renewable energy sources. Modernising such processing facilities represents an opportunity to improve processing efficiency and deliver climate mitigation through reduced waste and utilisation of renewable/cleaner energy sources. Finally, several processors are at maximum capacity and thus unable to deliver the quantities of product demanded by the market. This is the case for Sina Gerard's chilli oil factory, where they cannot meet market demand due to the limited capacity of their processing facility.

### 3.2.4 Consumption

**Many vegetables are consumed at home and are thus important for food security.** Vegetables are relatively easy to grow, and any household can produce them, even in urban areas with limited access to lands, and they can be produced year-round. This makes them a valuable option for smallholder farmers in Rwanda, who often have limited access to land and resources. They are an affordable source of vitamins, minerals, and fibers. Including various vegetables in diets helps improve nutritional intake and address micronutrient deficiencies. This is particularly important for vulnerable groups, such as children, pregnant women, and the elderly, who require a diverse and balanced diet for proper growth and development. In addition to their nutritional value, vegetables help to improve food security by increasing household income. The most significant part of vegetable production (about 80% of the

<sup>28</sup> NAEB (2022). [Annual Report 2021-2022](#). Retrieved June 18, 2023

<sup>29</sup> [Packaging strategy, 2022](#)

household vegetable output) is delivered to the market, providing the farmers with a source of income to purchase other food items like animal-source foods (ASF) or invest in other productive activities. Therefore, vegetables play a role in ensuring food security in Rwanda. Their nutritional value, contribution to dietary diversity, year-round availability, income generation, and market opportunities improve access to nutritious food. The GoR promotes the production and consumption of vegetables through MINAGRI's Nutrition-Sensitive Agriculture Mainstreaming Guideline<sup>30</sup>. The GoR also implements various initiatives to encourage its production. These include the Crop Intensification Program (CIP) and the Kitchen Garden Program, which enable farmers to grow vegetables.

**Domestic consumption is driven mainly through local markets, which are particularly important for poorer households in Rwanda, who are being impacted by inflation.** The domestic market for fresh vegetables has been growing by 6% per year over the past ten years (Figure 4) due to the increasing population, rising incomes, urbanization, changing dietary patterns, and increasing awareness of the importance of a healthy diet. The shift towards more nutritious diets and growing awareness of the health benefits of vegetables present significant opportunities for farmers and agribusinesses to expand their production and meet the rising demand.

**Some higher-end domestic markets available through supermarkets and hotels, though the scale is limited.** The efforts of the GoR to develop tourism industry started to deliver tangible effects for agriculture activities especially vegetables farming. Supplying hotels, restaurants, and tourism establishments with fresh and locally sourced vegetables can foster strong linkages between the two industries, expanding the market for high-quality produce. However, this market is still relatively small, with anecdotal evidence suggesting that market access is based on informal social networks and thus would likely be hard for SHFs to penetrate at scale.

**The Government of Rwanda school feeding programme represents a sizable potential domestic market.** According to Ministry of Education, for the education year 2021/2022, the number of schools that provided meals to students was 3,978 (82.2%) totalising 3,375,454 students fed at school, representing 86.3% of the total student population. To support local economic development and smallholder farmers' access to markets, the school feeding programme purchases foods mainly from farmer organisations and some processors in Rwanda. As such, the local purchase of different food commodities provides a profitable marketing opportunity for smallholder farmers and is directly supporting the Rwandan economy. This is highlighted by the existence of SMEs such as AgriLec Ltd, who's primary market is school feeding programmes for which it has contracts with 27 schools. School feeding is directly linked to WFP's Farm to Market Alliance initiative, where smallholder farmers are linked to local markets and financial institutions to access the capital required. It must be noted that the growth of school feeding in Rwanda is almost entirely reliant on a World Bank and World Food Programme<sup>31</sup> funding and therefore the sustainability of this market must be assessed before SMEs and SHFs are encouraged to become reliant on it.

### 3.3. Key Supporting Function Services and Actors

**For the core market to operate efficiently and effectively, there is need for provision of relevant support functions and services to allow the core market actors to produce, sell or buy their core product and for the value chain to grow in a competitive manner.** These support services range from those needed to support supply of inputs to provision of extension services and provision of business development services. Supporting functions include key processes which lead to increased production and commercialisation of core value chain functions. Support functions usually influence several actors in the core market or value chain

---

<sup>30</sup> MINAGRI (2020). Nutrition Sensitive Agriculture Mainstreaming Guideline.

<sup>31</sup> Africanews (April 2023)

at the same time and are therefore of crucial importance. The key support services required by the value chain functions include:

### 3.3.1 Farm labour

**Many vegetable farmers, especially those with larger plots >1 Ha, rely on seasonal farm labour for sowing and harvesting vegetables.** The source of farm labour is typically individuals with smaller (<1 Ha) or no plots, where vegetable production is less labour intensive. These individuals are hired particularly at the points of land preparation, sowing and harvesting. They are typically on informal contracts and paid daily in cash (KII's suggested salaries of around 1,500 RWF per day). Such labourers are often the poorest and most marginalised actors in the vegetable market system and interventions could look to assess how their incomes can be improved through connecting employing SHFs with larger/higher value markets.

### 3.3.1 Access to agricultural extension and market linkage services

**Good Agricultural Practices (GAP) training has been provided to many farmers, where it has been successful, and yields have increased there has not always been a market for the additional produce.** SHFs organised into cooperatives and SMEs require extension services on a regular basis to ensure good agricultural practices. This includes technical advice on agriculture to farmers and supplies them with the necessary inputs and services to support their agricultural production. It provides information to farmers and passes to the farmers new ideas developed by agricultural research stations. Increasingly, this includes advice on climate smart agricultural practices which can help to facilitate climate mitigation, adaptation, and resilience amongst SHFs. Despite some adoption of these practices, they are not yet widespread as SHFs fail to see the market incentives for improved production due to inability to sell additional quantities and a lack of market for higher quality produce.

**Government agricultural extension exists but due to lack of capacity has minimal impact 'on the ground' with SHFs.** Currently, the government of Rwanda through its mandated institutions (RAB, RICA, NAEB, RWB, REMA,) provides agricultural extension services, and the aim is to create the professional agribusinesses and a conducive environment for commercial agriculture where vegetables sector is among the priorities.

**Private extension service providers are present but often fail to meet SHF and SME needs.** SMEs and cooperatives need BDS to improve their business performance. Most cooperatives and SMEs have insufficient inhouse business management skills in the areas of financial planning and management, human resource management and marketing. This has limited their profitability alongside the high cost of production and the mismanagement of revenues. There is an urgent need for these services by cooperatives and SMEs, but the cost is too high, and profits too minimal to invest in BDS. There are a good number of BDS providers, such as Inkomoko, Business Partners Network (BPN) and Royal Partners, and BDC at District level that offer services in accounting, human resource management, finance and marketing to cooperatives and SMEs. However, many of these providers have a limited understanding of the actual needs of smallholder vegetable farmers and simply offer supply led products or services which do not adequately address the needs of this client group. BDS providers need research mechanisms that allow them to understand different client segments; and technical support to tailor their services for SHFs, cooperatives and SMEs.

**In addition to production-focussed extension, service providers such as One Acre Fund (OAF) help provide business linkages between SHFs and SMEs to overcome a common constraint of SHF vegetable market system.** OAF use an out-grower model for dried and fresh chilli, French beans, and will soon expand into garlic. OAF provides extension services to farmers and pre-finances inputs (seeds and chemicals) to ensure that produce is of sufficient quality for export. In building production capacity, OAF is also able to connect SHFs

to high value and stable markets, overcoming two primary constraints faced by vegetable SHFs. OAFs services also benefit exporting SMEs as they remove the burden of dealing with SHFs from SMEs, which is often a primary bottleneck to growth. They do this by building trust with both parties and using this to broker fair out grower contracts between farmers and exporters. They also provide several other services to SHFs, including insurance.

**NAEB is the primary government department offering market linkage services but they are limited.** NAEB supports the private sector in showcasing Rwanda's horticulture products and establishing trade agreements and partnerships with international markets to enhance exports, especially targeting Middle East countries. NAEB and various development partners have provided the farmers and vegetable entrepreneurs capacity building and training programs. These programs aim to enhance skills, knowledge, and best practices in vegetable production, post-harvest handling, and marketing. Despite this, many SMEs suggested that NAEB's pack-houses were almost always full and that, whilst NAEB were happy to facilitate shipping, they would not support in identifying international buyers for produce.

### 3.3.2 Equipment Providers

**In general, vegetable production in Rwanda is characterised by a lack of mechanisation, with few service providers for equipment noted.** The government through MINAGRI supported actively farmers to access basic assets like irrigation equipment (which can help with climate adaptation and resilience), spraying tools, green houses, nursery nets etc by providing subsidies and matching grants. In addition, equipment on value addition and processing have also been facilitated by the GoR and other stakeholders (donors and NGOs) to vegetable value chain actors. Despite these activities, much of the vegetable production in Rwanda remains manual and use of equipment is rudimentary. As such, connect SHFs with affordable equipment suppliers offers opportunities to improve production efficiencies.

**Access to irrigation is often done on credit or through a service provider as to install a static system is prohibitively expensive.** Some SHFs use small-scale irrigation for vegetable farming including water cans and pumps using generators. However, there are few farmers who started to use drip irrigation systems, but suggest this technology requires considerable capital at the beginning and skills for use and maintenance. There are also observed instances where drip kits sit idle or unrepaired. In addition, the government in collaboration with Buffet Foundation introduced the Pivot Rotation Irrigation System in Kirehe District. There is an opportunity to support in introducing eco-friendly irrigation technologies such solar pumps and pedal irrigation machines to reduce GHG emissions.

**In addition to private suppliers, the Government of Rwanda has also invested heavily larger scale irrigation schemes.** Investments in infrastructures include developing irrigation schemes through significant investments like Kayonza Irrigation and Integrated Watershed Management Project (KIIWP), Kirehe Community-based Watershed Management Project (KWAMP), Rural Sector Support Project (RSSP), Land husbandry, Water Harvesting and Hillside Irrigation (LWH), Sustainable Agricultural Intensification and Food Security Project (SAIP), Commercialization and De-Risking for Agricultural Transformation Project (CDAT), etc.). Investment in irrigation infrastructure aims at availing water for vegetable production year-round. All these large projects aim to improve land management, increase water availability, and enhance agricultural productivity in regions vulnerable to recurrent rain shortages or floods. The projects established climate-smart adaptations technics, including:

1. Bench terracing to reduce soil erosion and water runoff, allowing water to infiltrate the soil and recharge groundwater,
2. Rainwater harvesting structures (valley dams, water reservoirs, and rooftop rainwater harvesting tanks) to increase water availability for agricultural activities during dry periods, supplement rainfall, reduce dependence on erratic rains, and
3. Capacity building and knowledge transfer to empower farmers with the necessary skills and knowledge enables them to effectively implement and sustain climate-smart practices.



### 3.3.3 Financial Services

**SHFs struggle to mobilise sufficient capital to invest in production or aggregation infrastructure.** Financial services, such as loans for assets and working capital are required by actors in all the functions of the value chain. However, in 2021 just 1.5% of new authorised loans went to agricultural related activities<sup>32</sup>. This is low particularly because agriculture contributes up to 25% to national GDP and employs an estimated 70% of the labour force in Rwanda. The low rate reflects several constraints limiting SHFs and SMEs from accessing finance. These include stringent requirement such as collateral and guarantees, lack of information on available financial products and providers, lack of financial and managerial skills and high interest payments (up to 25%). These constraints limit availability and accessibility to finance for actors and hamper investment into more advanced and/or larger scale production and processing.

**Certain demographics are particularly marginalised from accessing finance.** Whilst low literacy and education is a problem across all SHFs, 92% of female workers with no formal education work in agriculture compared to 77% of males with the same educational level, this manifests itself by the number of women are still overwhelmingly engaged in producing lower-value subsistence crops while men tend towards cash crops. This results in financial institutions unwillingness to loan funds to women in the sector. The same also applies for youth who fail to easily access formal lending due to lack of collateral required. Gendered differences in access to finance have material impacts on production; for example, only 8% of women access and use improved seeds compared to 18% of men. Only 15% of women have access to inorganic fertilizers (and 45% to organic fertilizers) compared to 20% of men. For organic fertilizers, usage follows the same trend with 75% of men compared to 45% of women<sup>33</sup>.

**Many financial institutions in Rwanda are poorly equipped to service SMEs and SHFs.** On the supply side, the key constraints relate to the ability and capacity to assess risk by staff within financial institutions, lack of diversified and tailored agri-financing products, and high cost of capital to serve risky sectors like agriculture. Due to the poor tailoring of services, many SMEs reflected on their awareness of financial products but unwillingness to engage with them due to perceptions of risk, especially regarding uncertain marketability of produce and therefore source of income to repay any loans taken.

**An opportunity exists to support the financial institutions to tailor financial products to the needs of vegetable farmers, as well as supporting farmers to obtain and benefit from financial services.** This implies the provision of technical assistance in terms of capacity building to financial institutions in understanding the needs of the different vegetable actors and designing relevant financial products. There is also a need to support SHFs and SMEs in financial management tools and trainings, business planning and legal assistance to be able to fulfil the financial institutions requirements to obtain financing or investments.

**Despite these challenges, several sources of finance are emerging in Rwanda.** The financial sector is growing when it comes to agricultural lending and savings products (Table 4) especially from Micro Finance Institutions (MFIs) and saving groups for Micro and Small Enterprise (MSMEs). There are currently 16 commercial banks, one development bank (Banque Rwandaise de Development (BRD)) as well as more than 500 MFIs and rural savings and credit cooperatives in Rwanda. In addition, the sector is served with Village Savings and Lending Associations (VSLAs) as informal but well-structured lenders. Bilateral and multilateral development finance and various international development financial institutions provide different instruments to support the agricultural sector. Most of the support provided is in the form of grants either administered through the government's budget or directly through projects they are implementing. There are also development finance institutions that support specific sectors (exports) with a guarantee facility implemented by BRD and the Rwanda

---

<sup>32</sup> BNR, Annual report, 2022

<sup>33</sup> MIGEPROF (2020). [Revised National Gender Policy](#). Retrieved June 20, 2023

Green Fund for developing a green economy<sup>34</sup>. Finally, there are impact funds and social enterprises actors such as One Acre Fund, AgDevCo and Inkomoko, to mention a few, that have come into the market to fill the gap around input provision and extension services respectively. One Acre Fund is a social enterprise that supplies smallholder farmers with asset-based financing and agriculture training services to reduce hunger and poverty. Inkomoko provides BDS services to SMEs through its incubation programme coupled with the provision of micro loans<sup>35</sup>.

**VLSAs are the most frequent source of agriculture credit.** About 6% of farming households have borrowed from these for farming purposes, while only 0.35% of households have an agriculture loan from a commercial bank. The percentage of households that typically borrow from the formal financial sector (i.e. commercial banks, MFIs and Savings and Credit Cooperative Organisations (SACCOs)) is substantially higher in urban areas than in the rural parts of the country and is more prevalent among economically well-off households. Although BRD's loan portfolio to the agriculture sector still represents more or less 5% of its total outstanding loans, its contribution to the total agriculture loan portfolio of all financial institutions remains the largest (41% in 2017) while the share of MFIs is growing every year (e.g. from 8% in 2012 to 20% in 2016)<sup>36</sup>.

**Table 4: Profiling the types of finance available to SHFs and SMEs in the market system**

Type of finance	Description	Providers
<b>Community savings groups</b>	<p><u>Description:</u> is a community solidarity based micro credit model under which 25-30 members meet in a self-managed group once a week to save and borrow money.</p> <p><u>Opportunities:</u> Creation of proxy and local financial services that back up people with limited financial means in accessing capital and saving culture development.</p> <p><u>Challenges:</u> Weak financial competences and skills due to the lack of financial literacy of many members of community saving groups.</p>	SACCOs VSLAs Microfinance Institutions
<b>Donor grants/ match funding</b>	<p><u>Description:</u> Fixed term social and economic development programmes with specific objectives, target groups, intervention areas, approach and methodology, period of execution.</p> <p><u>Opportunities:</u> Offer supports (financial, organisational and technical) to groups of people with limited resources to back up them for their livelihood's security enhancement.</p> <p><u>Challenges:</u> Limited period of intervention, conflicts between qualitative and quantitative results, no exit strategies for the support sustainability, insufficient financial capacity, mindsets of beneficiaries.</p>	Programmes and projects of USAID, UKAID, Embassy of Netherlands, ENABEL, Oxfam UK, IFAD, World Bank, World Food Program, KOICA, JICA, NGOs, etc.
<b>Impact investment</b>	<p><u>Description:</u> Impact investment refers to investments made into companies, organizations, and funds with the intention to generate a measurable, beneficial social or environmental impact alongside a financial return. Impact investment is also defined as an</p>	Mastercard Foundation BDF

<sup>34</sup> [Rwanda Green Fund](#) was started by the Government of Rwanda in 2012 and explicitly aims to technical and financial support to the best public and private projects that align with Rwanda's commitment to a green economy. This is a significant opportunity for organised SHFs and SMEs in the vegetable sector who are interested in scaling climate smart initiatives.

<sup>35</sup> Minagri, National Agriculture Financial Services Strategy, 2022

<sup>36</sup> AFR, Agriculture Finance Year Book, 2018

	<p>investment strategy that aims to generate specific beneficial social or environmental effects in addition to financial gains.</p> <p><u>Opportunities:</u> Offer particular focus on vulnerable groups for their livelihood security. Promotion of social inclusion, climate change adaptation measures promotion and environment conservation. Human rights promotion, capacity development for vulnerable people including smallholder farmers, etc.</p> <p><u>Challenges:</u> Limited resources (Funds), not popular and accessible for all categories of people especially marginalised and vulnerable people.</p>	
<b>Private investment</b>	<p><u>Description:</u> A private investment is an alternative investment, is a financial asset outside public market assets such as stocks, bonds, and cash. Qualified investors often access private investments through an investment fund. In other word, private investment means money invested by companies, financial organisations, or other investors, rather than government.</p> <p><u>Opportunities:</u> Increase the distribution of money in various sectors of business. Promote entrepreneurship capacity of people at micro and macro levels. Facilitation the exploitation of existing business opportunities in society. It reduces the gaps between social classes and stimulate smallholder farmers when private investment takes their produces as raw materials for processing.</p> <p><u>Challenges:</u> Level of financial freedom of people due to the lack of financial literacy, entrepreneurship skills and competences push people to see risks in private investment than its benefits. Weaknesses of systems, institutions and organisation of the society (Lack of enabling environment).</p>	Private companies and investors (foreigners and nationals)
<b>Commercial loans</b>	<p><u>Description:</u> A commercial loan is a debt-based funding arrangement between a business and a financial institution such as a bank. It is typically used to fund major capital expenditures and cover operational costs that the company may otherwise be unable to afford. Expensive upfront costs and regulatory hurdles often prevent small businesses from having direct access to bond and equity markets for financing. This means that, not unlike individual consumers, smaller businesses must rely on other lending products, such as lines of credit, unsecured loans or term loans.</p> <p><u>Opportunities:</u> Offer to people the access to capital to invest in their businesses for expansion or adoption of new technologies, solutions, etc.</p>	Banks, Microfinance institutions

	<p><b>Challenges:</b> It's mandatory for clients looking commercial loans to have collaterals and practice savings on regular basis, which is a difficult condition for smallholder farmers with limited resources. The interest rate is always very high due to the risks related. Loans require skills and competences still very weak for many people especially smallholder farmers who the majority is illiterate.</p>	
--	---	--

**Opportunities are present in improving SME and SHF access to agricultural finance.** Finance can help facilitate improved production and allow SMEs and SHFs to service larger and more reliable markets. Any work in this area should look to build upon the significant work of the FCDO IMSAR programme, which made significant strides with regards to agricultural financing<sup>37</sup>. For example, IMSAR worked with Equity Bank to improving access to commercial finance for farmers and agribusinesses through financial product innovation and the value chain financing approach. Several other financing options are listed in the IMSAR completion report and will be leveraged in CASA interventions focusing on access to finance.

### 3.3.4 Transport and Logistics

**Transportation from farms, often provided by independent service providers, is often not suitable for the international markets, with more perishable vegetables such as tomatoes, onions, French beans and amaranth often damaged in transit.** Despite a tax exemption on transporters put in place by the Government of Rwanda, there is still lack of appropriate transportation facilities like cold chains and other required facilities. In addition, even where cold chain (or freezing) services are available, there is a mindset issue from both traders and consumers who are reluctant on frozen/cold-room-stored vegetables and prefer to buy fresh produce delivered to the market that day. Finally, accessibility to remote areas (quality of roads), including many marshlands, constitutes a limiting factor.

**Transport is often prohibitively expensive for SHFs when negotiating with individual service providers; as such, many opt to sell locally.** This practice of selling locally by many farmers is linked with their mindsets characterised by escaping all forms of additional costs after hardworking of farming. With a lack of capacity to clearly define the production cost of their produces, they always prefer to sell directly to the local market. The existence of many middlemen who are ready to pay cash and get produce from farmers encourage them to sell locally and avoid the burden of paying additional cost. There is therefore the opportunity for farmers to organise into groups/cooperatives to be able to properly negotiate for profitable markets.

**Cold-room/chain and storage is particularly relevant for vegetables; consequently, government and development actors continue to invest in infrastructure.** Post-harvest infrastructures have been developed by the government and development actors. This includes cold rooms, aggregation points, and drying sheds, are developed at each irrigation scheme to improve postharvest activities and deliver quality vegetables to the market. Other GoR interventions include greenhouse and small-scale irrigation technologies promoting irrigation on small plots, with 50-50 subsidies and the value-added tax (VAT) exemption on agriculture equipment and unprocessed vegetable production<sup>38</sup>. Greenhouse technology is gaining momentum in Rwanda, but smallholder farmers (SHF) see greenhouses as expensive, out-of-reach, and left for better-off farmers.

<sup>37</sup> [IMSAR Completion Report 2022](#)

<sup>38</sup> RRA (2022). [Goods and services are exempted from Value Added Tax \(VAT\)](#). Retrieved May 25, 2023

**Despite the presence of such infrastructure, much of it is lying idle**<sup>39</sup>. Donor installed cold rooms (often hybrid energy) at markets often have unclear ownership (they are not tied into business models, there is poor knowledge amongst market traders on how to access and safely store produce) and suffer from negative perceptions amongst traders and consumers with regards to stored foods, with the preference being for fresh on the day produce. Whilst SHFs often decry the need for such cold storage so their product does not spoil and they can sell larger quantities, any efforts to improve availability and utilisation of storage and transportation of vegetables for the domestic market will have to be accompanied by an awareness raising campaign regarding the benefits for traders and consumers. Several initiatives are already looking at doing this, including the [Africa Centre of Excellence for Sustainable Cooling and Cold-Chain](#), hosted by REMA, which would be valuable partners in any interventions in this area.

### 3.3.5 Certification Services

**Certification is essential to access high volume export markets but is often out of reach for exporters.** Most export companies target the European, American and Asian countries who are very strict in terms of quality food products. This requires tough conditions and standards and compliance from production, harvest, collection, processing to export. Such certifications can be both financially and technically out of reach of SMEs, especially where they require high degree of engagement and traceability of SHF production. As such, opportunities exist to help SMEs achieve certification and subsequently access larger and higher value markets, allowing them to offtake more SHF produce.

**There are a variety of standards certificates and approvals that can be required by vegetable produce, often varying by chosen market/buyer.** Full procedure for export of plants and plant products implies sequentially compiling the licenses, permits and clearance steps to be fulfilled by a registered business owner exporting plants and plant products for the first time out of Rwanda. For example, phytosanitary certificate is an official document issued by the Rwanda Agriculture and Livestock Inspection and Certification Services (RALIS). It certifies that the plants or plant products covered by the certificate have been inspected according to appropriate procedures and are free from quarantine pests and that they are considered to conform with the current phytosanitary regulations of the importing country. Additionally, certificates of origin issued by NAEB attests from which country export goods have been obtained, produced, manufactured or processed. It is beneficial for trade agreements, such as existing arrangements with EAC, COMESA or EU countries; that grant to certain export products from Rwanda preferable market access. For vegetables based processed products, there are other required certificates like “S” Mark which is national certificate provided by Rwanda Standards Board (RSB). It’s very important and approve the trustable quality of the product in terms of standards. There are other certificates provided by international institutions like HALAL, HCCAP, FSSC, ISO, Euro-GAP, Globo-GAP, SMETA etc. which can be mandatory or voluntary depending on the buyer.

### 3.3.6 Business Development Service Providers

**Both Farmer Groups and SMEs often lack a commercial behaviours, attitudes, practices and knowledge to ensure effective operation of their enterprises and therefore suffer from challenges to scale.** This reflects a general lack of public and private business development support services available, or invested in, to improve such capacities. There are several government-based initiatives; however, their penetration seems to be lacking, likely due to poor capacity and coverage but also lack of knowledge from SMEs and SHFs on how to access. The Government of Rwanda initiated the Business Development Services (BDS) at District level to back up SMEs across the country. The institution has a decentralised based

---

<sup>39</sup> NAEB (2019). [Status of Cold chain infrastructure in Rwanda](#), retrieved May 20, 2023, and ACES (2021). Primary Research Report on Rwandan Agricultural and Vaccine Cold-chain Equipment, Policies, Programmes and Practices.

structure which allows to approach the community in remote areas. For community-based enterprises which include cooperatives and farmers' unions and federations, Rwanda Cooperatives Agency (RCA) provides capacity building of cooperatives in terms of entrepreneurship, business skills development, management and governance. The institution also faces the same challenges as BDS. Rwanda Development Board (RDB) has also in its mandate the responsibility of promoting private investment for the economy development through linking national and local entrepreneurs and investors. However, many entrepreneurs including SHFs don't have the information to enable them to capitalise the available opportunities.

**Beside these public institutions, there are private business development services providers who operate mainly in the City of Kigali, in the provincial cities and few at district level.** It is worth mentioning also the business development services provided by some development programmes implemented by non-governmental organisations and export companies whose business models and strategies put a particular focus on empowering the smallholder farmers to meet their market demand. An opportunity exists for connecting SMEs with suitable BDS providers to help them to take the steps towards commercial vegetable production and facilitate improved terms of engagement for the SHFs they source produce from.

### 3.3.7 Research and development services

**The Rwanda Agriculture Board (RAB) is the public institution responsible for research and development of agriculture sector.** It conducts researches and disseminates the results for the benefits of agriculture's actors including smallholder farmers of vegetables. Even if the institution does a lot of things, there are gaps in the flow of information to spread the research's results and make sure that they are communicated to the end users, in particular smallholder farmers. Additionally, RAB continues to focus on production, and it is essential that they look to include pathways to commercialisation in their research and development agenda.

**Several donor programmes also conduct a suite of research, the learnings from which should be integrated into any subsequent projects.** Again, there is typically an issue of coverage and dissemination of this information which often fails to reach SME and SHFs at scale. As such, there is an opportunity for programmes such as CASA to pilot innovative pathways to commercialisation and methods of greening production for climate adaptation and resilience with SMEs and SHFs, which could then be scaled up through public and private institutions.

### 3.3.8 Existing donor projects

**Many public interventions, donor-funded initiatives, private sector investments, and Non-Government Organizations support are available in the vegetable sector.** The private sector invests in production and post-harvest technologies (greenhouses, irrigation, post-harvest infrastructures, and cold chain). At the same time, other interventions tend to support farmers and other chain actors to build their production and marketing capacity while investing in public and large production and post-harvest facilities. An initial assessment of current programmes is given in Annex 2. In general, all projects are helping to improve the production, marketing, and consumption of vegetables in Rwanda. They are also helping to improve farmers' livelihoods and contribute to the country's economic growth.

## 3.4. Enabling Environment Issues and Actors

Formal and informal rules and regulations guide actors in the market and directly impact on the ability of the value chain and support system to develop. These include trade policies, agricultural policies, and laws as well as informal traditions and values set that influence behaviours and functional relationships in the market. Several ministries and GoR institutions are involved in establishing the enabling environment for a strengthened vegetables sector in

Rwanda. The key ministries and their relevant interests and functions are summarised in Annex 2.

The key issues in the enabling environment that directly affect the vegetable value chain, either enabling it to grow or hindering growth, include:

### 3.4.1 Policies

**Horticulture, including vegetables, is a priority growth area for the GoR, creating a strong enabling environment.** The development of the vegetable sector in Rwanda is embedded in the framework of the horticulture export-oriented growth, the country wants to scale up the production and export of high-value horticulture crops, such as French beans, avocado, passion fruits, mushrooms, snow peas, and Karela, under NAEB leadership<sup>40</sup>. In the 7-Year Government Programme National Strategy for Transformation (NST1, 2017 – 2024), which aims at doubling vegetable yields by 2024<sup>41</sup>, vegetables are promoted as labour-intensive and high-value crops with potential for job creation, income generation, and export earnings.

**Vegetables are also prominent in the National Agricultural Policy (NAP).** Derived from the NST1, 2017's National Agriculture Policy (NAP) promotes vegetables as potential export products. They are suitable for air transport to high-value and niche international markets due to their relatively higher value per hectare and kg. The policy emphasizes the importance of promoting sustainable agricultural practices, improving access to inputs and finance, enhancing market linkages, strengthening research and extension services to increase farm income, and decreasing post-harvest losses<sup>42</sup> from 45.5% (2017) to 22.8% by 2024<sup>43</sup>. As an implementation strategy of the NAP, the fourth Strategic Plan for Agriculture Transformation (PSTA IV) supports the private sector to expand the area for vegetable cultivation, from 20,000 ha to 100,000 ha (including 1,200 ha of greenhouses), with intensive vegetable production using greenhouses, drip irrigation, hydroponic and aquaponic systems as innovative technologies to overcome challenges related to land scarcity and fertility, water efficiencies, and boosting high-value crops production, such as hot chili, French beans, sweet/bell pepper, cherry tomatoes, and snow peas<sup>44</sup>. PSTA IV goes beyond focusing on vegetable exports and promotes the production and consumption of nutritious vegetables to meet the growing need for healthy foods by establishing kitchen and school gardens. It aims at solving specific micronutrient malnutrition through the production of nutrient-dense vegetables, like orange-fleshed sweet potato (OFSP), dark leafy/green vegetables (red and green amaranth, spinach, drumstick leaves, pumpkin, and carrots)<sup>45</sup>.

**GoR is also working with regional bodies to explore new opportunities for commercialising the vegetable market system.** GoR is working with the East African Community (EAC) and Common Market for Eastern and Southern Africa (COMESA) to expand the opportunities created by agricultural growth and integrated regional trade. The Africa Continental Free Trade Agreement (AFCFTA) is also another important platform to be explored and capitalized for vegetables market opportunities.

**The National Environment and Climate Change Policy also has important implications for agricultural activities in Rwanda.** Agriculture is one of the key areas identified for climate mitigation under Rwanda's Nationally Determined Contribution (NDC). It is also cited as one of the key sectors in ensuring that Rwanda's climate and environment are sustainably managed for future generations. Particular emphasis is placed on agriculture in addressing

<sup>40</sup> NAEB (2019). [Strategic Plan \(2019 – 2024\). Increasing agri-export revenues](#). June 9, 2023

<sup>41</sup> MINECOFIN (2017). [7 Years Government Programme: National Strategy for Transformation \(NST1\) 2017–2024](#). Retrieved May 19, 2023

<sup>42</sup> It should be noted that, whilst the policy is export oriented, all of these factors can create benefits for domestic production and can be applied to all varieties of vegetables, including those primarily sold domestically.

<sup>43</sup> MINAGRI (2018). [The National Agriculture Policy](#). Retrieved May 19, 2023

<sup>44</sup> MINAGRI (2018). [Fourth Strategic Plan for Agriculture Transformation \(PSTA IV\)](#). Retrieved May 19, 2023

<sup>45</sup> MINAGRI (2020). [Nutrition Sensitive Agriculture Mainstreaming Guidelines](#). Retrieved June 5, 2023

soil and wetland degradation (thorough adoption of GAPs), trialling early meteorological warning systems for planning, improving water management systems and techniques, the protection of Rwanda's natural resources and ecosystems and, finally, the scaling up of efforts to promote climate resilience.<sup>46</sup>

**Several policies also address GESI in agriculture.** The GoR's [Gender Monitoring Office](#) oversees initiatives promoting gender equality and social inclusion in the vegetable sector, mainly focusing on women and youth access to land, credit, and agricultural inputs, training and education, formation of women's cooperatives and development of policies that support gender equality and social inclusion. The Ministry of Agriculture and Animal Resources (MINAGRI) has also developed a gender policy and a gender and youth mainstreaming strategy for the agricultural sector<sup>47</sup>. This policy aims to promote gender equality and social inclusion in all aspects of agriculture, including producing, processing, and marketing vegetables. In addition to public policy, interventions from development actors have strengthened the capacity of their partners and beneficiaries in GESI, where for example the projects funded by USAID in last 10 years like PSDAG, HINGA WEZE, HINGA WUNGUKE and NGURIZA NSHORE have mandatorily integrated GESI in its activities. The positive signs are observed in farmers' groups, cooperatives, traders, exporters and processors and among others, where representation of women and youth is increasing. The willingness of smallholder farmers regarding GESI has increased considerably and there is a strong foundation to build on.

**Vegetable production also heavily features in MINAGRI's Guidelines on Nutrition 2020<sup>48</sup>.** The guidelines suggest promotion of nutritious varieties of vegetable crops is an effective intervention to address specific nutrition issues. In addition, any interventions to increase farmer's access to production assets such as land and water are effective contributors to household food security. In the marketing and distribution, the value chain integration, introduction of quality control and standard measures, grading, development of cold chain for perishable products and other market and transport infrastructures are potential interventions that will reduce waste and improve food availability. Example interventions include developing community-based processing ventures that can increase year-round availability of food, thereby directly contributing to reducing the negative impacts during the lean season on overall food security in the localities. In addition, vegetable interventions combined with extensive nutrition education offer a long-term, food-based strategy to control and eliminate micronutrient deficiencies. From a demand side, connection to large export markets as well as domestic promotion of vegetable consumption can also have significant impacts. For example, nutrition education and food preparation techniques (cooking demonstrations, dietary counselling, etc.) where participants actively engage in and learn about appropriate food preparation methods to reduce nutrient losses, appropriate food combinations for improved nutritive value can be beneficial. Finally, the preparation of vegetable-based complementary foods for children under the age of 2 should be promoted. These interventions can help to both improve the demand for vegetables in Rwanda and also promote recognition of their important role in nutritious diets.

### 3.4.2 Standards

**Standards are particularly relevant for the export market, with recipient buyers in Europe, USA, and the Middle East having strict requirements on fresh produce.** Within Rwanda, there are institutions responsible for technical support provision, verification and supervision of standards like RSB, FDA and RICA. They operate interactively, complementary and facilitate all actors with businesses that require standards service. However, certification

---

<sup>46</sup> [National Environment and Climate Change policy](#)

<sup>47</sup> MINAGRI (2017). [Gender and Agriculture](#). And MINAGRI (2019). [Gender and Youth Mainstreaming Strategy](#). Retrieved May 25, 2023

<sup>48</sup> MINAGRI, Nutrition Sensitive Agriculture Mainstreaming Guidelines, 2020



and standards meeting are listed by some actors as one of their major challenges. Actors cite the cost, technical difficulty and lengthy bureaucratic processes as key barriers to achieving standards for export. Work could be undertaken with standards bodies in Rwanda to consolidate these processes to help facilitate SMEs achieving the required standards.

**As the domestic market is predominantly driven through local markets, standards are much less significant in this arena.** However, as the high-value domestic market grows, there will be an increasing need for producers to meet standards such as SMETA<sup>49</sup>, which is required by high-end hotels and supermarkets.

### 3.4.3 Private sector bodies

**Several private sector bodies act to provide capacity building and advocacy services to vegetable producers (both SHF and SME).** For example, the Private Sector Federation (PSF) provides a range of enabling environment services, including advocacy, market linkage, access to finance and networking with development partners. PSF is organised into five clusters, one of which is agriculture, which have representatives at national, provincial and district levels. The agriculture cluster through is coordination unit, support different companies, associations, and organisations in the horticulture sector, including the producers, aggregators, processors and exporters. It also supports SMEs, cooperatives and individuals working in agriculture in Rwanda for commercial purpose. All members pay registration and membership fees to the PSF. Additionally, the Horticultural Exporters Association of Rwanda (HEAR) is a non-political, non-profit making and democratic member-based umbrella organization of all horticulture actors who is committed to the production of high quality and environmentally friendly products while ensuring the health and welfare of the consumers. Finally, Rwanda Horticulture Interprofessional Organisation (RHIO) is a private entity initiated by SMEs with activities in vegetables, fruits and flowers businesses.

## 4. Problem Analysis

### 4.1. Problems and Underlying Causes

There are numerous problems that SHFs and SMEs face when trying to improve and commercialise vegetable production and they can be found in almost all areas of the market system. The problem analysis below draws from the constraints identified throughout the sections above and seeks to define and prioritise the issues which are currently affecting the performance of the vegetables market system. This has been done through a root cause analysis to understand why each of the key problems are occurring - to ensure that subsequent projects address systemic causes rather than just responding to the symptoms. These are also presented in the Intervention Logic Analysis Framework (ILAF) table.

List of problems:

- Substandard technical and business skills for SHFs.
- Limited knowledge on commercial agriculture (farmers still use traditional farming rather than commercial farming).
- Weak farmers organisations limits both production and marketing of vegetables (cooperatives are perceived not providing appropriate services to their members).
- Limited public extension service providers and expensive private providers.
- Limited infrastructure facilities along the value chain (production, storage, processing, and distribution).
- Limited access to commercial financial services.
- Limited access to market information.

---

<sup>49</sup> [SMETA](#)

- Poor relationships between SHFs and markets, both domestically where traders offer low prices and for export, where contracts are often poorly enforced.
- Lack of a large processing industry to offer meaningful off-take and address shelf-life issues of vegetable produce.

The key problems fall under two primary categories which have been analysed in further detail: **production challenges** and **market challenges**. These two sets of issues, which have several interconnections, are explored below.

## 4.2 Poor Quality and Quantity of SHF Vegetable Production.

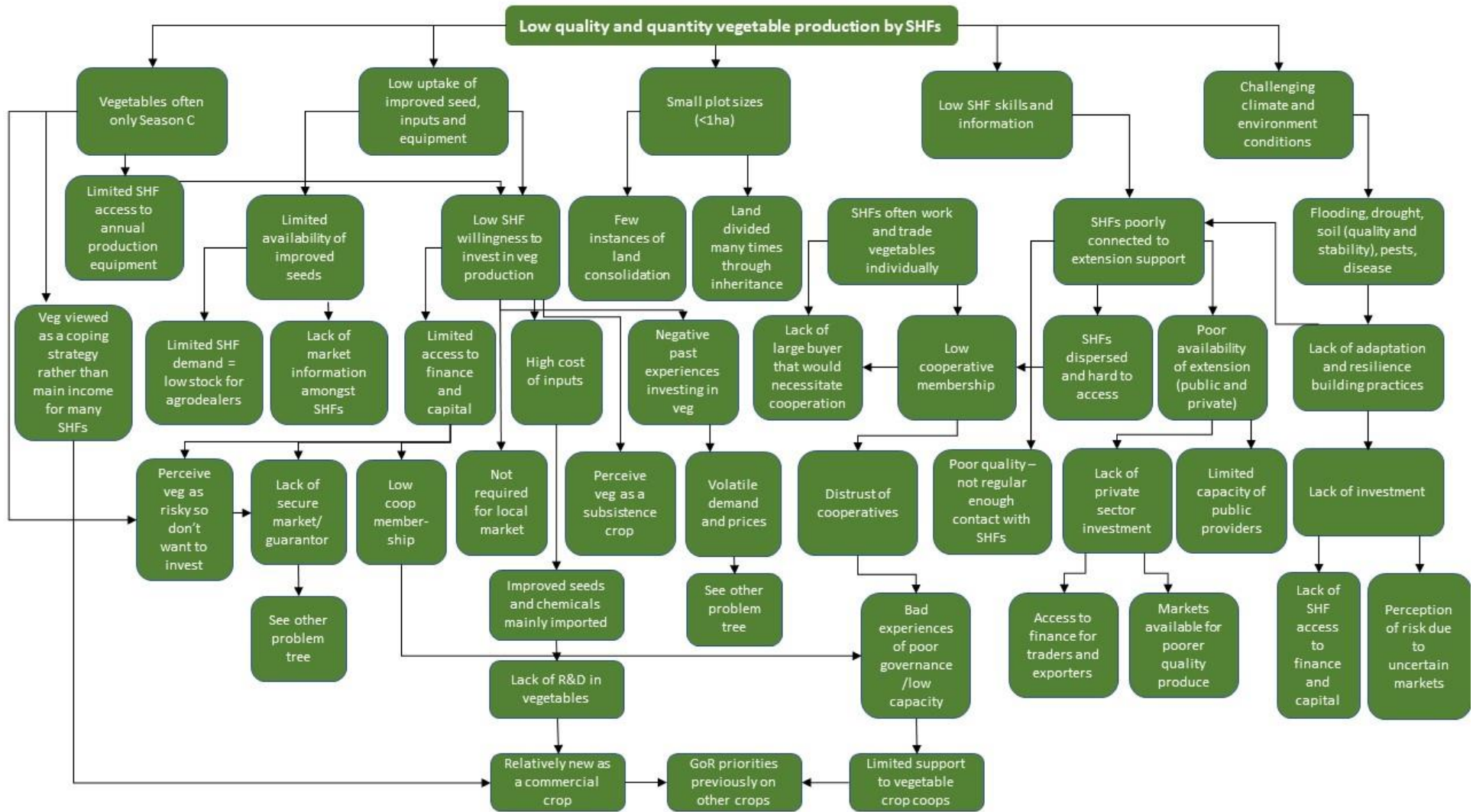


Figure 8: Problem analysis for poor quality and quantity vegetable production in Rwanda

**Utilisation of inputs (seeds, approved fertilisers and pesticides and machinery) is low due to reluctance and inability of SHFs to invest in production.** This is because of the farmers' mindset on using agricultural chemicals, coupled with market failure to guarantee both price premium and market for produce which disincentivises investment in high quality inputs. This is further exacerbated with high cost of inputs and limited access to finance. Additionally, the lack of pilot and trials' plots closer to farmers means they cannot visualise the benefits of adoption. Furthermore, changes in climate and environment (both drought and flooding) have led to many SHFs seeing losses when they have invested in improved inputs, discouraging wider adoption and investment which is viewed as risky. This is particularly an issue for women farmers, who often lack the initial capital or access to finance to purchase quality inputs. However, women' farmers low reliance on inputs can also be leveraged for more environmentally friendly farming practices.

**Changing climate and environmental conditions are putting increasing strain on production quantity and quality.** Due to climate change, the availability of rain is irregular and inconsistent during the two main agriculture seasons (A & B) on upland areas, creating unsuitable conditions for vegetable production. More recently, SHFs in marshland areas have opted to farm vegetables in season C; however, this is often poorly organised. In addition, there are still challenges linked with financial and technical capabilities on SHFs to embrace climate change and environment adaptation measures because they often require investment and/or skills acquisition for which services are lacking.

**Poor access to extension services means that SHF skills and information are often limited, reducing yields.** There are a limited number of public and private extensionists, with those that do exist often lacking an understanding of the needs of farmers/cooperatives. In addition, the high cost of service provision from private extension service providers is a barrier to many SHFs. There is an issue of gender equality and social inclusion within extension services itself, due to the type of its activities which require a lot of mobility, many women are not interested in the profession, and it affects the sensitisation and technical support services provision to women farmers of vegetables.

**Catalysing production is challenging as many of the 311,000 SHFs working in vegetables are producing and marketing as individuals rather than collectively.** Many farmers distrust cooperatives; this is rooted in poor cooperative governance and performance, failing to deliver as expected by farmers. Working individually leads to low bargaining power from farmers with regards to relatively powerful buyers and traders in both domestic and export markets. Whilst some successful cooperatives do exist and their models should be learnt from, many still have equity issues regarding the meaningful inclusion of women and youth and their ability to gain the power and skills necessary for equitable access to resources and benefits.

**Due to challenges of production and market, vegetables are still seen as a 'season C' crop by many SHFs, limiting total production volumes in Rwanda.** This is because of encountered actual risks linked with flooding in marshlands in Season A and B which prevent vegetable production. In addition, season A and B are prioritised by farmers for producing traditional food crops such as maize for household food security, which also often have a more reliable market and are less at risk of post-harvest losses. Improvement in market potential of vegetable crops, improved access to climate-smart techniques (irrigation, water management etc.) and greater awareness of their nutrition benefits could see vegetables become a year-round crop for SHFs.

**Lack of a stable market is a primary factor behind production challenges, many of which stem from a lack of willingness to invest.** When SHFs are faced with uncertain prices and quantity demand from both domestic and export markets they are often unwilling to invest in improved production out of fear of making heavy losses (this is true of SHFs who own and SHFs who lease their land). However, in instances where SHFs have benefited from extension and market linkages and been able to organise themselves for collective marketing and improved production, profitability has been achieved. This highlights the opportunities for vegetable production as a meaningful source of SHF income in Rwanda.

### 4.3 Lack of Reliable Market for Vegetables Produced by SHFs:

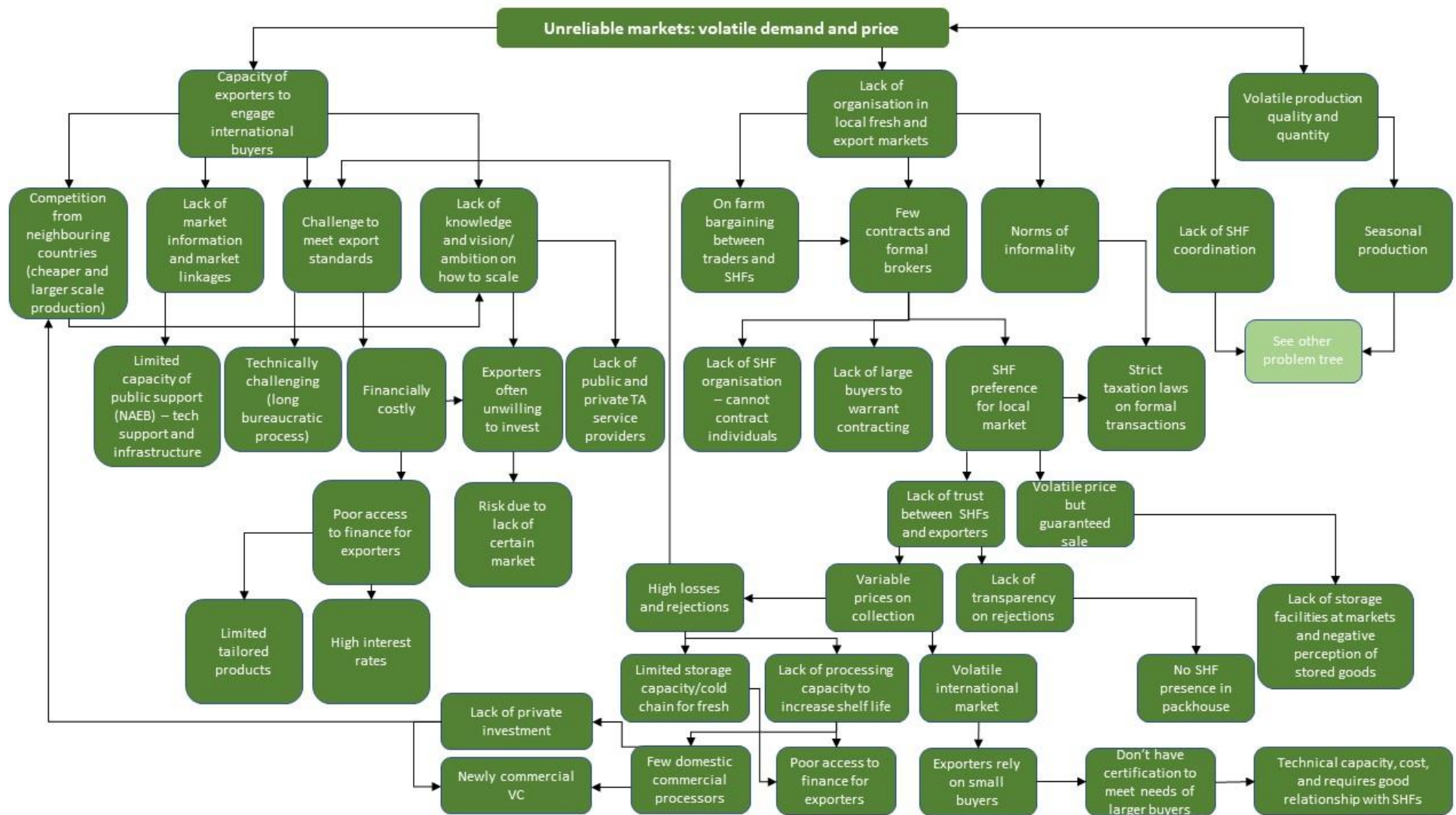


Figure 9: Problem analysis for volatile market demand and price for vegetables in Rwanda

**As discussed in section 4.2, vegetable production quantity and quality in Rwanda faces several challenges which hinder the development of a reliable and high value market.** There are numerous exporters interested in procuring high-quality vegetable produce at scale from SHFs in Rwanda. However, as SHFs are generally poorly organised and lack technical and financial capacity to achieve certification they are often difficult to access for SMEs looking to broker contract agreements. Quantity is also an issue, with many farmers currently only producing vegetables in season C, which is also a driver of domestic market volatility. Better organised and higher quality SHF production would help both draw larger buyers from the export market and help to reduce the volatility in the domestic market.

**Local markets are characterised by a lack of organisation and low-quality infrastructure, leading to SHFs being squeezed on prices and high losses in storage and transport.** Produce passes through several informal traders before reaching local markets. Much of the produce can be damaged due to the inadequacy of transportation for perishable vegetable products. Once produce reaches the market, it is sold in low quantities to individual traders. Furthermore, these traders often have limited access to any cold-storage meaning that any produce not sold at the end of the day is sold for very low prices or wasted; this drives down the overall price of vegetables at local markets. Even where cold storage is available, it is often not integrated into a business model with market traders unaware or untrusting of how to gain access. Finally, even if access is gained, consumer preference for vegetables freshly delivered to market that day prevent widespread uptake. High wastage in the market system drives up the carbon footprint of the product, with opportunities therefore present in increasing supply chain efficiency and minimising wastage.

**On-farm bargaining dominates when produce is sold to domestic traders or regional exporters; this is a highly unreliable method of marketing for SHFs, leading to low prices and unstable demand.** Attributable to lack of farmers strong organisation and coordination for bulk selling to bargain for better prices and limited knowledge on cost of production. This keeps SHFs achieving low prices for their produce and prevents growth of vegetable production to commercial scales. Whilst it is a current information gap, it is likely that women producers are squeezed more significantly than their male counterparts.

**Local markets are often preferred by SHFs due to fractured relationships with exporters.** It's difficult for exporters to make formal commitment and to be precise on the quantity that they can buy from SHFs and exports because of unreliable buyers on their side. This pushes many exporters to plan purchases of vegetables with limitations. With very limited capital and therefore delayed payments common from exporters, SHFs prefer immediate cash payment offered by local traders who don't require produces of high-quality standards, as opposed to international exporters who don't guarantee price premium for high quality produce and in most cases, they don't pay in cash. This causes the maintenance of many informalities of domestic market operations because of the unprofessionalism of primary actors (producers, collectors/aggregators, retailers, and processors).

**Exporters struggle to engage international buyers because of a lack of market information, challenges to meet the required standards and lack of knowledge and ambition on how to scale.** This is because of the limited capacity of public and private supporting services, expensive and long processes for standards compliance, limited access to technical and financial services offered to exporters and difficulties in engaging with SHFs to encourage them to make the necessary changes to meet export demands. Some emerging solutions to this are offered by market linkage actors such as One Acre Fund who have more patience and expertise in engaging with SHFs and encouraging improved farming practices to support meeting export standards.

**Due to their own marketing challenges, exporters view engaging SHFs as inherently risky and therefore require support to improve this crucial aspect of their business.** These challenges are a result of the lack of guaranteed international markets, driven by poor quantity and quality of produce by SHFs and SMEs. But also, on exporters side, there is a

weakness of missing reliable platforms and networks by which the information related to international market opportunities are accessed.

**Investment by market actors is limited due to access to finance challenges but also a lack of willingness to take on financial risk, especially in an unstable market.** As mentioned above, the vegetables farming activities remain at an informal stage, few SHFs and business driven actors are struggling to professionalise their enterprises. This is mainly because of the very limited tailored financial products and perceived high interest rates on the financial market because many financial services see agribusiness as a very risky enterprise and fear to embark in with attractive financial products.

**The lack of a developed processing sector means that actors are limited by the realities of deals in fresh produce which is inherently more exposed to market volatility due to short shelf-life.** This is due to limited access to finance and developing commercial vegetable value chain with few processors willing to invest in appropriate equipment and facilities. The majority of current investors interested in vegetables processing business are at early stages of development. The SHFs of vegetables who should be the foundation of vegetables processing initiatives don't have entrepreneurship skills and lack specialists to support them and enable them to think out of the box for the preservation and conservation of their produces. The lack of research and development services is also a challenge for vegetables processing activities development.

## 5. Strategy for Change

The inclusive growth strategy is designed to respond to and strengthen the weaknesses in the current service provision and enabling environment. This takes the form of defining the growth potential and opportunities of the sector, developing the sector vision of change for an inclusive and competitive sector, and ultimately identifying opportunities to demonstrate SHFs and SME commercialisation.

### 5.1. Market Potential, Opportunities, and Growth Potential

SHF and SME commercialisation can only be achieved by addressing the underlying causes of key blockages and taking advantage of the opportunities present in the sector. Having analysed the vegetables market system in Rwanda, the team identified five possible drivers of commercialisation.

**Driver 1: Increased organisation amongst SHF producers to facilitate access to inputs and improved technical and financial services to improve quality and quantity of production.** Organised SHFs (especially those in marginalised groups – women and youth) will be better positioned to access relevant, accessible and affordable technical assistance on, cooperative culture and governance, entrepreneurship and business skills, inclusive and climate smart (mitigation, adaptation, resilience) production practices, access to inputs and access to equitable and stable markets where they have strong bargaining power.

**Driver 2: Improving value addition and processing capacity** through leveraging green-finance to develop efficient and environmentally friendly processing techniques at farm level (grading, sorting, storage, drying and packaging) and also helping existing processing SMEs to scale their operations to include more SHFs in their supply chains.

**Driver 3: Improved market linkages between SHFs and aggregators, processors, or exporters.** Including support in market linkages facilitation (i) promote formal contract farming models through technical assistance, (ii) support in market intelligence activities for SHFs and SMEs to improve their planning and sales both domestically and internationally.

**Driver 4: Improved exporter and aggregators/processors capacity to provide significant offtake** (unlikely to be achievable through domestic market) including support in accessing

infrastructure facilities for storage to increase the quantity and quality of produce sourced from SHFs.

**Driver 5: Leveraging increased investments into the vegetable sector.** Including working on both the demand through technical assistance in financial literacy and finance readiness, and supply side through the development of tailored financial products for SHFs and SMEs who are also well connected to investment opportunities which they have sufficient capital (technical and financial) to access.

## 5.2. Vision of Change

The purpose of the vision of change is to contemplate how the system would operate if identified constraints and underlying causes were to be resolved. Having mapped the market system and identified the key problems, the findings of the work were synthesised with the contributions from key informants and actors regarding what the vegetables market system could look like if these challenges were overcome. The result of this process was the following vision statements. Recognising that different core market actors have different roles in the market system and different priorities, in addition to a generic vision statement, a statement is provided for each of the core actors.

**Vision of change for the vegetables market system:** A viable, inclusive, and climate smart vegetable sector with quality produce and productivity from SHFs and SMEs through increasing access to investment, affordable inputs, appropriate technical, organisational and managerial support and fair market linkages both domestically and internationally create a sector in which SHFs and SMEs thrive and their businesses are mitigating climate impacts and providing adaptation and resilience to those already being felt.

**Vision of change for SHFs, cooperatives and farmer groups:** Well organised and professional SHFs using climate smart practices produce high quality and quantity vegetables throughout the year for which they have a stable and fair domestic and/or export markets with growing revenues and opportunities to invest in value addition and storage infrastructure.

**Vision of change for processors:** A vibrant vegetable processing sector using efficient climate friendly technologies emerges, funded by available and green finance, for numerous varieties of vegetables serving both export and domestic markets with high quality produce, creating reliable offtake of produce from SHFs.

**Vision of change for local markets:** Well organised and professional aggregators, traders and transporters have access to finance to procure the required facilities, increasing their capacity to source more produce from SHFs, supplying to domestic markets where produce can be stored at the market, limiting wastage.

**Vision of change for international exporters:** Well-equipped and professional exporters have international buyers that reliably purchase large quantities of vegetables and fulfil these markets through strong relations with numerous SHFs based on fair contracting agreements for high quality produce.

## 6. Interventions

### 6.1. Intervention Areas and Project Outlines

To realise the vision described above, an Intervention Logic Analysis Framework (ILAF) (Table 5) is employed to identify potential areas of intervention and activities that will address the identified systemic weaknesses in the entire market system. The indicative activities are streamlined and grouped into five broad intervention areas. The five intervention areas listed in Table 5 are linked to the five drivers of commercialisation emerging from the problem



analysis as detailed in section 5.1. The ILAF shows the connections between the problems of the beneficiaries and the interventions that can be deployed to solve them by strengthening the system.

**Table 5: Intervention Logic Analysis Framework highlighting the connections between the problems of the beneficiaries and the interventions**

Problem/symptom	Underlying Cause	Support and Regulatory functions	Service Weaknesses / underlying causes	Interventions	Potential partners
<b>Poor quality and quantity of SHF vegetable production</b>	Poor organisation of SHFs limits access to support services	Inputs, extension, finance	Often unavailable or prohibitively expensive for SHFs and/or services that are inappropriate for SHF needs, especially for women SHFs	(1) Facilitate TA to existing cooperatives to improve GESI, organisation and professionalism of SHF vegetable production (identifying markets, collective access of inputs and finance).	Potential private companies (Private producers and buyers for domestic and exports)
	Climate change increasingly impacting vegetable production (pests and disease, flooding)	Extension (lack of knowledge) and access to finance (lack of investment in CSA)	Often prohibitively expensive for SHFs and/or services that are inappropriate for SHF needs, especially for women SHFs	(2) Link cooperatives with TA on CSA. (3) Link cooperatives with SME offtakers such as exporters who can provide training on CSA practices to improve quantity and quality of produce for export markets.	YEAN Rwanda, RYAF, DAS Ltd. Urugaga Imbaraga, Ingabo Organisation, APIB (BDS providers)
	Lack of certain markets to incentivise improved production	Market linkage service provision	Very few providers that understand the needs of both SMEs and SHFs	(4) Work with existing market linkage providers such as OAF to help improve their capacity to reach more SHFs and SMEs OR look to privately scale the OAF model through other SMEs.	MINAGRI, Ministry of Environment, RWB, REMA, RAB, etc (Technical support) One Acre Fund, Exporters looking to improve SHF linkages
<b>Lack of domestic vegetable processing</b>	Lack of investment in processing	Access to finance	Often prohibitively expensive for SHFs and/or services that are inappropriate for SHF	(5) Help existing processors to access sufficient finance to improve efficiencies and capacity (including climate impact) of processing units to	Potential private processors (Shekina, Sina Gerard etc.)

<b>and value addition</b>			needs, especially for women SHFs	allow more SHFs to be incorporated into the supply chain.	
	Vegetables as a relatively new commercial product in Rwanda	Technical assistance and market information on processing opportunities	Lack of business development services for prospective processors	(6) Provide technical assistance to SMEs and cooperatives interested in starting up basic value addition activities.	Cooperatives; aggregators; exporters
<b>Informal and inequitable linkages between SHFs and markets</b>	Lack of trust due to previously disregarded contracts	Market linkage service provision	Few trusted actors working in this space due to low profitability and high degree of informality	(7) Provide TA to SMEs on how to equitably engage farmers, learning lessons of existing actors such as OAF.	One Acre Fund; Cooperatives
	Lack of collective marketing by SHFs	Extension on market opportunities and engagement	Extension is primarily production focussed needs to be rebalanced to have a demand focus	See interventions (1) and (3)	
	Lack of/unused storage opportunities at local markets	Access to information and finance	Lack of access to finance Poor awareness amongst traders and acceptance amongst consumers of cold storage benefits	(8) Promote awareness raising on the benefits of cold storage amongst traders and consumers and pilot innovative business models on integrating cold storage into the market system.	Finance providers; traders; aggregators; REMA (ACES)
<b>Limited capacity of exporters to engage</b>	Lack of reliable SHF producers	Inputs, extension, finance	Often unavailable or prohibitively expensive for SHFs and/or services that are	See interventions (1) and (2)	

<b>reliable international buyers</b>			inappropriate for SHF needs		
	Difficulty attaining required certifications and standards	Certifications and standards are financially and technically challenging and take a long time to achieve	Capacity of certification and standards bodies to engage SMEs  Extension and access to finance for SMEs	(9) Work with SMEs and SHFs to access the finance and TA required to achieve certifications and standards and with certification bodies to make the process more accessible.	Standards and certifications boards (RSB); MINAGRI; NAEB; Private extension providers
	Lack of storage infrastructure for larger orders	Government services and access to finance	NAEB facilities over stretched and lack of TA and finance for private investment	(10) Help exporters to leverage the finance required to improve storage capacity and connect to larger buyers to warrant investment.	Exporters, Inkomoko, Business Partners Network, etc. (BDS Services Providers), NAEB (public cold storage)
<b>Poor availability of affordable and accessible finance for SHFs and SMEs</b>	High perception of risk in agricultural finance, especially vegetables as a newer commercial crop with high spoilage rates	Access to finance	Often unavailable or prohibitively expensive for SHFs/SMEs and/or services that are inappropriate for needs, especially for women SHFs	(11) Work with financiers, SMEs and SHFs to connect to existing and co-create new financial products for development of the vegetable market system. This will leverage lessons learned from IMSAR to build on their successes.	Potential private companies (producers, aggregators, processors, exporters) Financial institutions and investment funds (Banks, Microfinances, BDF, FONERWA, etc.) Inkomoko, BPN, RYAF, YEAN, DAS, etc. (BDS)

The eleven interventions (Table 5) are directly linked to the drivers of commercialisation highlighted in the analysis of sections three, four and five.

## 6.2. Sequencing and Prioritisation of Projects

There are 11 intervention areas identified in Table 5. Based on the objectives of the CASA programme and the complexity of delivery, the following prioritisation and sequencing is recommended (Table 6). Again, this sequencing should be assessed with potential partners prior to implementation as they are likely to have individualised needs. Of course, many of the intervention areas will spread over multiple years depending on the rate of progress.

**Table 66: Sequencing of interventions in the vegetable market system.**

<b>Year 1</b>	<p><b>Interventions 1 and 2</b> – the basis of all interventions will have to be promoting organised and climate resilient practices with good access to inputs amongst SHFs so that they can meet the market needs of exporters and negotiate more equitable relationships with domestic traders and aggregators.</p> <p><b>Interventions 3, 4, 7 and 9</b> – concurrently to organising SHF production, work will have to be started with both SMEs and existing market linkage service providers to enable them to efficiently engage SHFs with improved production.</p> <p><b>Intervention 10</b> – Exporters will also need support to access and service their own markets also to meet the standards and certifications required to engage large and reliable international buyers, this will include gaining access to finance for infrastructure such as cold storage and chain.</p> <p><b>Interventions 5 and 6</b> – Supporting the growth of existing and establishment of new processors and value addition activities by SMEs and cooperatives will help address challenges in storage and market volatility currently seen in the vegetable market system.</p>
<b>Year 2</b>	<p><b>Intervention 8</b> – A key driver of improving domestic market will be the integration of cold storage in trader business models. Doing so will require awareness raising amongst traders and consumers about the benefits of cold storage for vegetable produce. Lessons learnt from work on cold storage with exporters in year 1 can be leveraged for this intervention area.</p> <p><b>Interventions 11</b> – To ensure the sustainability of the interventions piloted in year 1, it will be imperative to work with SMEs and cooperatives but also financiers on access to existing and development of new financial products that are tailored to the needs of actors in the vegetables market system.</p>

## 7. Stakeholder Assessment

The Power-Interest Matrix is designed to help categorise relevant stakeholders and suggest engagement strategies for the different groups.

**Figure 10: The Power-Interest matrix of stakeholders and engagement strategies**

High	Gashora Farm PLC, Agriseeds Rwanda Ltd PEBEC, Almond Green farm Ltd, Bahage Ltd, CF Premium Ltd, Floris Rwanda, HEAR, Sunripe Farms, IMRB – Garlic,	One Acre Fund, RAB, MINAGRI, RSB, FDA Urwibutso Enterprise, BDF, RWB, RCA, Shekina Enterprise, REMA, PSF, NAEB, RICA, Souk Farms Investment, MINICOM, RDB Tearfund, Oxfam UK, KOICA, JICA Hinga Wunguke/CNFA, BRD, DUTERIMBERE, URWEGO, COPEDU Microfinances, Hortinvest/SNV, Holland Green Tech, Agrotech, Garden Fresh, Got It, Districts – Cash Crops Units (19), Aproxfarm, Proxfresh, Virunga Biotech Ltd, Rwanda Air, Davis & Sheflif Ltd, Netafim,	
		Urugaga Imbaraga, RHIO Gwiza Cooperative, INGABO Indatwa za Kamonyi Cooperative Impabaruta Coop, Kinyinya and Kajevuba Marshland Coops, Agrilec Ltd, Isonga Coop, COJUNGE Coop, Bishenyi Coop, KAIGA coop, Step Company, APIB, Fidelis Legal services Ltd,	
Power			
Low			
	Low	← Interest →	High

CASA will adopt the following strategies for interacting with the sector stakeholders:

- **Low power, low interest:** CASA will stay receptive towards these actors; although they do not seem important, nor very relevant at this stage, they may still prove to be as the programme continues to build understanding of the system. If they show an interest, CASA will provide them with information about the repetitive investigation and intervention preparation process.
- **High power, low interest:** CASA will stay open minded about these actors; they are powerful, and they may turn out to be important drivers of change, despite them not seeming very relevant at this stage. They will be kept informed of CASA activities with tailored information designed to stimulate their interest and participation, utilising their power to be drivers of change.
- **Low power, high interest:** CASA will stay open minded about these actors; they are an important part of the market system. Ignoring them may have severe unintended consequences. CASA will keep them informed about the investigation and preparation process. Additionally, CASA will also seek opportunities to connect them with high power but low interest actors, with one actor providing the power and the other having the interest to direct that power to the right use.
- **High power, high interest:** CASA will actively target these actors; they are both important parts of the system and the ‘movers and shakers’ that have lots of power to change things. CASA is now engaging them and will do so throughout the intervention preparation process, also looking for opportunities to link them with other actors in the top left or bottom right quadrants of Figure 10 to bring other actors on board. These constitute important catalysts for change, especially given the limited time in which CASA will have active interventions in the Rwanda vegetables market system.

## 8. Preliminary Assessment of Potential Partners

The Willingness and Capacity matrix is designed to identify which players to target or prioritise and the type of support required to change their behaviour.

**Figure 11:** The willingness and capacity matrix

<b>High</b>	Gashora Farms PLC, Pebec, Almond Green Farm Ltd, IMRB – Garlic, Got It, Garden Fresh, AgriSeeds Rwanda Ltd,	Urwibutso Enterprise, Floris Rwanda, Souk Farms Investment, Proxy Fresh, One Acre Fund,
	<b>Capacity</b>	The Step Company Ltd
<b>Low</b>		
<span style="float: left;">←</span> <span style="float: right;">→</span> <b>Willingness</b>		
<span style="float: left;">Low</span> <span style="float: right;">High</span>		

The potential partners for intervening in the vegetable market system in Rwanda can be split into three categories:

- Firstly, companies like Urwibutso Enterprise, Proxy fresh, Souk Farms, Aproxyfarm, Shekina, Veggie Fresh, etc, are strong and keen in their businesses. They have financial capacity and the opportunities for SHFs for raw material production and supply. With support, these actors would be interested in expanding their operations and bringing more SHFs into their supply chains. Partnerships with these enterprises offers a significant opportunity to improve the trial and adoption of various climate-smart interventions across the market system.
- Secondly, companies like Agrilec, Crinnod Ltd, Women Mart & Export Network, Kazihorti, etc, have the market opportunities for export and domestic market but they are being challenged by lack of enough capital to invest. As such, they would be interested in TA to help link them to finance, expanding their activities and thus bringing more SHFs into their supply chains.
- Finally, companies like Sunripe Farms, Gashora Farms PLC, etc are strong and well organised with stable market for export but they are not interested in building strong interactions and linkages with SHFs. However, following successful pilots with the above mentioned companies, these SMEs may be more interested in engaging.

## 9. Information Gaps

The following are key information gaps identified through this analysis that warrant further investigation:

- There is no official data by which you can find the exact SHFs and their level of technical and financial competences and skills in terms of farming activities.
- Vegetables are often grouped in with horticulture for trade reports. As such, finding data on the demand and supply of different varieties of vegetables is challenging and time consuming – this is something that will have to be an ongoing effort throughout the intervention period.
- There is very little reliable data regarding GESI in the market system at the national level, this will have to be assessed on a case by case basis when designing interventions.

- Data on producer organisations is scarce and unconsolidated. There is data related to aggregators, traders, exporters companies provided by different public and private institutions which are not consolidated, like RDB, NAEB, RSB, FDA and PSF. But for producers' companies, there is no information. Data that is available on existing companies involved in aggregating, processing, internal trading and exportation of vegetables is not updated by considering the dropouts and adding the new joining.
- There are important differences in the challenges and opportunities of 'large' and small' SHFs; however, there is no readily available details on the number of producers per size of land holding e.g. >1Ha (subsistence/minimal marketing; 1-5 Ha (semi-commercial) and 5+ Ha (commercial). Furthermore, there isn't clear guidance on classifying SHFs by size of land holding.
- Being grouped with horticulture means that the specific policy priorities and the enabling environment they create for vegetables is somewhat unclear. The horticulture strategic plan has a sector on vegetables; however, there is still a gap in what should be done or followed by actors. There is a need to have a conversation with actors such as MINAGRI, RAB, NAEB, FDA, MINICOM, etc to understand what can be done.
- Within the market system several information gaps exist between research and development institutions and SHFs and SMEs meaning that the latest developments often fail to reach the ground.
- Information gaps exist regarding the exact impact of climate change on vegetable production and how this varies across the different production environments in Rwanda. This gap also applies to SHFs who are not always fully aware of the impact of climate change.
- Nowadays, agriculture as whole and particularly vegetable farming activities are very connected with climate change and environment, the primary actors need to be much informed by well-established facilities which don't exist. It's the same with food security and nutrition, the people should be informed about the contribution of vegetables for their health based on tangible and accurate information.
- Fair price/fair trade: one of big and persisting gaps is the consideration of production cost in prices determination. Until now, the prices of vegetables are determined by buyers and mostly done unfairly. There is no official system by which pricing exercises are regulated and SHFs are the primary victims of such practice. This gap is for both domestic and international market.
- Tailored financial products for vegetable businesses: There is still lack of consolidated information regarding the financial service providers that have the specific products for actors in vegetable sector



## Annexes

### Annex 1. Next Steps

During the inception phase, CASA Rwanda employed a market system development approach to arrive at the inception deliverable of this Inclusive Growth Strategy document.

Supported by the project's technical advisors, the CASA country teams completed the following steps of the market systems development approach:

- i) Development of the market dynamics and institutional landscape (combination of desk research, key informant interviews and participatory stakeholder workshops);
- ii) Analysis of systemic constraints and underlying causes of slow investment uptake for commercialisation of the vegetables market including validation with market actors;
- iii) Development of the inclusive growth strategy for stimulating greater investment in the vegetables sector along with theory of change and vision of change;
- iv) Mainstreaming of CASA cross-cutting themes (gender and social inclusion, climate and environment, food security and nutrition, and animal welfare) in (i) and (ii) above;
- v) Identification of intervention areas and design of outline projects, including initial interactions with potential SME and other partners and service providers, and completing pre-due-diligence assessments of SMEs;
- vi) Developing an initial list of potential sources of finance and investment for SME matchmaking, including accelerators and incubators for potential BDS and support to SMEs for investment readiness preparation.

The next steps in the process are:

- a. scoping of project concept notes (first three months of implementation), including mainstreaming of CASA crosscutting areas;
- b. design of project plans, including mainstreaming of CASA crosscutting areas and monitoring and results measurement activities, as well as partner due-diligence exercises, negotiations and contracting;
- c. implementation, monitoring, results measurement and evaluation;
- d. collaborating with Component C on preparing vegetable SME success stories and engaging with investment actors.

For FCDO to agree that a project is relevant, it may be necessary to make some changes to the outline projects portfolio during scoping of the project concept notes. CASA employs the following criteria to select relevant projects for producers, SMEs and the enabling environment:

- Does the project directly or indirectly target smallholders, especially women, with the capacity to step up – that is, increase production, productivity and quality to meet market requirements?
- Does the project directly respond to the food security needs of the region and/or the country?
- Are there suitable actors available to partner with?
- Does the project avoid distortion of the market and create a sustainable market?
- Does the project create access to commercial markets for target smallholders?
- Does the project demonstrate a business case or new business model that will attract investment to commercialise smallholder supply chains?

- Is the project feasible, sustainable, scalable and relevant (in terms of factors such as resources and timelines)?
- Are the cross-cutting issues incorporated where relevant?

CASA Component A employs the following guidelines to select partners:

- Businesses with an annual turnover under \$2.0 million, or less than 50 employees, or is classed as a SME or producer organisation as defined in the country they are based in;
- Wants to raise finance in the range of \$10,000 to \$1,000,000 either immediately or in the foreseeable future. (Exceptions could be possible to the lower limit, where there is expected to be a second round of finance meetings, or the limit is expected to be exceeded during the life of the CASA project);
- Ideally has not received finance in the past and does not have any significant outstanding loans. (An exception may be an SME seeking finance within the above range for a new stage of expansion);
- Already engages or has potential to engage significant numbers of smallholders in the supply chain, and shows willingness to do this;
- Demonstrates commitment to a growth and development strategy or ambition, and demonstrates commitment to undertake their responsibilities under CASA support;
- CASA has the potential to add value to the partnership (ideally something that the partner would not achieve or undertake without CASA support);
- Lastly, all partners must pass CASA's due-diligence assessment.

Work on identifying a roster of potential BDS providers for engagement, including assessment of service and delivery capacity building needs, will commence early in implementation. CASA expects to focus on a small number of the most relevant providers. Capacity building may centre on services development, testing and service evaluations and consumer and other research. Provider selection criteria are expected to include:

- Capacity to deliver services;
- Close to SHFs and SMEs in culture, operating environment and geography;
- Low-cost structure;
- Commercial focus, business culture and accounting and management systems;
- Organisational independence, especially from donor funds;
- Focus on services for SHFs and agri-business SMEs.

CASA will conduct an initial mapping of the investment landscape in Rwanda. A similar exercise for finance landscape mapping will also be conducted. The lists of actors from these exercises will be updated periodically.

The sector-inclusive growth strategy is responsive to weaknesses in service markets, the enabling environment and aggregation in the market system; and to the lack of investment needed for growth. Strategy formulation involves: (1) identifying the market potential, through calculations to show the sector's potential; (2) developing a sector vision of change for an inclusive and competitive sector; (3) designing a portfolio of interventions that can be targeted at specific market actors or groups of market actors to drive change in the market system and attract investment into target agribusinesses.

## Annex 2. Relevant Government Ministries and Donor Initiatives

There are several government ministries of relevance to the vegetables market system. Some of the key bodies and their relation to vegetables are listed below.

Ministry / institution	Function / relevance to market system
<b>REMA</b>	<p>Promote and ensure the protection of the environment and sustainable management of natural resources through decentralised structures of governance and seek national position to emerging global issues with a view to enhancing the well-being of the Rwandan people.</p> <p>All development activities done by people must be friendly with environment conservation, what means that the commercial agriculture which focuses on vegetables market system must take environment issue and climate change into consideration as long as the actors always seek the sustainability of their enterprises. REMA comes in as advisor and supervisor for the compliance of all established requirements.</p>
<b>RWB</b>	<p>Ensure the availability of enough and well managed water resources for sustainable development. Most lands used for vegetables farming in Rwanda are located in marshlands where water is the principal resource for irrigation of the vegetable farms. The increase of the number of water users in the marshlands requires a strong regulation.</p>
<b>MINAGRI</b>	<p>Promotes the sustainable development of a modern, efficient and competitive agriculture and livestock sector, in the interest of ensuring food security, agriculture export and diversification of the productions for the benefit of the farmers.</p>
<b>MINICOM</b>	<ul style="list-style-type: none"> <li>• Developing, disseminating, and coordinating the implementation of sector policies, strategies and programs related to trade and industry.</li> <li>• Regulating the trade and industry sector and all other attached sectors.</li> <li>• Developing institutional and human resources capacities in the industrial and commercial sector.</li> </ul>
<b>NAEB</b>	<ul style="list-style-type: none"> <li>• To advise on the development of policy and strategies for developing exports of agricultural and livestock products meeting international market requirements.</li> <li>• To implement policy and strategies for developing exports of agricultural and livestock products meeting international market requirements.</li> <li>• Provides trusted market intelligence, practical advice and business tools to help Rwanda companies expand in global markets.</li> </ul>

<b>RAB</b>	<ul style="list-style-type: none"> <li>• To develop agriculture and animal resources through research, agricultural extension and animal resources extension for interest of increasing agricultural and animal resources productivity and quality, as well as their derived products.</li> </ul>
<b>RRA</b>	<ul style="list-style-type: none"> <li>• Responsible for assessing, collecting, and accounting for tax, customs and other government specified revenues.</li> </ul>
<b>RSB</b>	<ul style="list-style-type: none"> <li>• To establish and publish of national standards.</li> <li>• To provide products and quality service certifications and monitor conformity for issued certifications.</li> <li>• To provide legal, scientific and industrial metrology services</li> </ul>
<b>FDA</b>	<ul style="list-style-type: none"> <li>• Protect public health through regulation of human and veterinary medicines, vaccines and other biological products, processed foods, poisons, medicated cosmetics, medical devices, household chemical subsistence, tobacco and tobacco products.</li> </ul>
<b>RICA</b>	<ul style="list-style-type: none"> <li>• Ensures that the production and importation of goods under its mandate meant for public use or consumption are conducted in accordance with regulations and standards.</li> <li>• Ensures the protection and promotion of basic consumer rights as well as safeguarding health competition among enterprises.</li> <li>• Ensure the quality of Agriculture inputs (Seeds &amp; Agrochemical) as well as, coordinating Sanitary and Phytosanitary (SPS).</li> </ul>
<b>RDB</b>	<ul style="list-style-type: none"> <li>• Accelerate Rwanda's economic development by enabling private sector growth.</li> </ul>
<b>BDF</b>	<ul style="list-style-type: none"> <li>• Support SMEs in guarantee for loans</li> <li>• Leasing for equipment for SMEs</li> <li>• Capacity building of SACCOs</li> <li>• Investment in agriculture and livestock</li> <li>• Provision of advisory services to SMEs</li> <li>• Provision of financial support</li> </ul>

In addition to government ministries, there are several ongoing development projects which any subsequent interventions should look to build on and create synergies with.

1. **GoR**: Multi-ministerial intervention in developing kitchen and school garden development programs for nutrition purposes<sup>50</sup>,
2. **NAEB**: The long-awaited Kigali Wholesale Market for Fresh Produce (KWMFP) construction in the Kigali Special Economic Zone (KZES) has been initiated with the agreement between Rwanda and the EU in October 2022. The market is expected to process 180,000 tons of horticultural products per year, and the construction will be undertaken in two phases for 27.6 million USD),

<sup>50</sup> Ref. Rwanda Water Portal ([Kitchen Garden](#)) and MINEDUC. (2021). [Rwanda School Feeding Operational Guidelines](#). Retrieved May 20, 2023

3. **IDH**: the [Market-led SMEs and smallholder farmer business support project in Rwanda](#) – Phase II project has launched early this year. It aims at creating new good jobs and improving the working conditions of workers in SMEs involved in Rwanda’s horticulture sector, and to improve the farmers’ livelihoods through enhanced production of high-value horticulture crops,
4. **TEARFUND**: the [Catalyzing Market Prospects for Horticulture Smallholder Farmers, Small and Medium Enterprises in Rwanda project \(2020-2025\)](#), funded by the EU, aims to improve the productivity and incomes of horticultural farmers in Rwanda and to increase the competitiveness of the sector,
5. **CNFA**: [USAID funded Hinga Wunguke Activity](#). aims to increase incomes and improve nutrition in Rwanda by sustainably increasing agricultural productivity and strengthening the domestic consumption and market for high-value and nutritious agricultural products.
6. **ITC**: Through the Division of Sustainable and Inclusive Trade/Women, Youth and Vulnerable Communities (DSIT/WYVC), the International Trade Center (IRC) supports existing refugees to increase the production of French bean, chili, passion fruit, and tomato and sell them to the market as a source of livelihood activities in the refugee-hosting districts.
7. **RDB**: Manufacturing Africa works on [developing the horticulture outreach strategy in Rwanda](#). The UK-funded program contributes to economic transformation in Africa by providing manufacturing companies and investors with transaction facilitation support to attract £1.2 billion of foreign direct investment (FDI) and create 90,000 jobs in new production facilities and across supply chains.
8. **KOICA**: the Smart Food Value Chain Management Project ([SFVCMP](#)), funded by Korean International Development Agency and implemented by RAB, is a five-year (2023 – 2026) 9.5 million USD project consisting of developing horticulture centres that will help reduce post-harvest losses and boost farmers’ income, by establishing cold chains and aggregation centers.
9. **Oxfam**: the Horticulture Value Chain is an EU-funded project led by [Oxfam in Rwanda](#) through DUHAMIC-ADRI COCOF and DUTERIMBERE as local partners. The project supports horticulture farmers in Nyagatare, Rulindo, Kamonyi, and Nyamagabe districts to return to normal horticulture production activities following COVID-19 disruption. will have improved the production and income of 21000 Rwandan horticulture farmers by 2024.
10. **REMA**: The Rwanda Environment Management Authority (REMA), has secured \$1.3 million (approximately Rwf1.5 billion) from the Food and Agriculture Organization (FAO) and the Green Climate Fund (GCF), to support the development of a cold chain system in collaboration with the Africa Centre of Excellence for Sustainable Cooling and Cold-Chain (ACES). The primary goal of this initiative is to reduce post-harvest losses and improve cold-chain infrastructure.
11. **RAB**: Rwanda Agriculture and Animal Resources Development Board has implemented the World Bank-funded Commercialization and De-Risking for Agricultural Transformation Project ([CDAT](#)) since July 2022. The project covers three subcomponents; (1) Irrigation rehabilitation and development, (1) Land husbandry, and (3) Innovation and services for agri-business development. The 300 million USD loan aims at supporting 236,000 farmers and agribusinesses working, among others, in Horticulture to improve access to finance.

### Annex 3. List of Potential Partners

N°	Partner Name	Profile	Location	Project Ideas and provided services
1	ABC GREAT LIFE Ltd	Exporter - UK	Kigali	Chilli
2	AGRILEC Ltd	Exporter – Domestic Market – School feeding	Kigali	French beans and other fresh vegetables
3	ALMOND GREEN FARM Ltd	Exporter	Kigali	Pepper
4	AN HINGA Ltd	Exporter – Belgium, Dubai, Middle East	Kigali	French beans and Chilli
5	BAHAGE Food Ltd	Exporter – Belgium, United Arab Emirates	Kigali	Hot pepper, French beans and cooking banana
6	CF PREMIUM COMPANY Ltd	Exporter	Kigali	Chilli
7	CRINNOD Ltd	Exporter – Dubai, UK	Kigali	Hot pepper, green chilli
8	DIVERSITY VENTURES	Exporter – UK, Dubai, Netherlands and Belgium	Kigali	Chilli and Hot pepper
9	EFFECTIVE MAND N Ltd	Exporter – UKM France	Kigali	French beans and green chilli
10	EXCELLA PRODUCE Ltd	Exporter – EU, UK, Middle East	Kigali	French beans and chilli
11	FLUVEG	Exporter – Belgium and UK	Kigali	Chilli, French beans, cooking banana
12	FRESHPACK International	Exporter – Belgium and UK	Kigali	Eggplant, pepper and banana

13	GARDEN FRESH Ltd	Domestic markets Exporter – UK, Netherlands, Belgium	Kigali	French beans, broccoli, baby corns
14	GASHORA FARMS PLC	Producer Processor Exporter – China, UK, Netherlands and Nigeria	Bugesera	Chilli
15	KAB FRujuuESH	Exporter - UK	Kigali	Chilli
16	KK FOODS	Exporter - UK	Kigali	Sugar snaps, Karella and French beans
17	IMARB Group	Production and Export of Garlic	Kigali	Export of garlic
18	LE GEANT BUSINESS GROUP Ltd	Exporter – UAE, Belgium	Kigali	Onions, carrot
19	LOTEC RWANDA Ltd	Exporter - UK	Kigali	Sugar snaps and French beans
20	NATURE FRESH FOODS Ltd	Exporter - UK	Kigali	Fresh vegetables
21	OASIS GROWERS	Producer Exporter	Kigali	French beans
22	PEBEC	Exporter – Spain and India	Kigali	Bird eyes chillies
23	PROXFRESH	Producer Exporter – France, Martius, South Africa	Kigali	Extra fine beans, snow peas, sugar snaps, and passion fruits
24	SOUK FARMS INVESTMENT	Producer Exporter – Dubai and India	Kigali	French beans and chilli

25	SUN FRESH Ltd	Exporter – Netherlands, UK, India	Kigali	Chilli, French beans, broccoli and baby corns
26	TEAM AFRICA Ltd	Exporter - UK	Kigali	Hot pepper
27	The Step Company	Cross-border markets (DRC – Goma) Domestic markets	Rubavu	Onions, carrot
28	TRANSCOM Ltd	Exporter - India	Kigali	Chilli
29	VEGGIE FRESH	Exporter – Dubai, UK, Netherlands	Kigali	Chilli
30	VIRUNGA BIOTECH Ltd	Exporter – UK, Germany, Spain, France, USA, Canada, UAE, Saudi Arabia and India	Kigali	Green Chilli
31	WOMEN MART & EXPORT NETWORK	Domestic markets Exporter	Kigali	Vegetables
32	NATURE CLOUDS	Exporter – Dubai, Belgium, Middle East	Kigali	French beans, chilli and avocado
33	SAFI PRICE Ltd	Exporter – Belgium, UAE	Kigali	Onions
34	LAKE LAND GROWERS Ltd	Exporter - Europe	Kigali	Pepper
35	FARM GATE Ltd	Exporter - UK	Kigali	Chilli
36	LOTUS GENERAL TRADING	Exporter - UK	Kigali	Chilli
37	SKY LOYAL TRADING	Exporter - UK	Kigali	French beans and chilli
38	SUNRIPE FARMS	Producer Exporter – UK, Belgium	Kigali	Hot pepper (Habanero)



39	BRG	Exporter – UK, Belgium	Kigali	Chilli
40	WIDE LANDS	Exporter - UK	Kigali	Green chilli and habanero
41	SIBO NATURAL FRESH	Exporter - UK	Kigali	Chilli
42	KASINGYE COMPANY Ltd	Exporter - Belgium	Kigali	Hot pepper
43	SHEKINA Enterprise	Processor Domestic markets Exporter – Europe, Asia and America	Rulindo	Cassava leaves
44	GREEN HARVEST PRODUCTS Ltd	Processor Domestic markets Exporter – Ghana, Kenya, Ivory Coast and Canada	Kigali	Pepper
45	URWIBUTSO Enterprise	Producer Processor Exporter – Africa, Europe, America and Asia	Rulindo	Chilli - Habanero
46	APROXFARM	Producer Exporter	Kigali	French beans and chilli
47	FLORIS RWANDA	Exporter – Gabon, France and Belgium	Kigali	Eggplant, potatoes leaves and banana
48	GWIZA FARMERS COOPERATIVE	Producer	Rwamagana District	Chilli, French beans, Tomatoes, Onions, Broccoli, Pepper, cucumbers

49	INDATWA ZA KAMONYI FARMERS COOPERATIVE	Producer	Kamonyi District	Onions, tomatoes and French beans
50	IMPABARUTA FARMERS COOPERATIVE	Producer	Kamonyi District	Eggplant, Tomatoes and onions
51	KAIGA FARMERS COOPERATIVE	Producer	Gatsibo District	Chilli, French beans, Tomatoes
52	KAJEVUBA COOPERATIVE	Producer	Gasabo District	French beans, amaranths, tomatoes, eggplant and onions
53	MOOD FARMS Ltd	Producer	Rwamagana District	Cabbage, Carrot, French beans, Garlic, onions and tomatoes
54	DAS	Agri extension services provision including insurance services	Kigali	All value chains
55	FIDELIS LEGAL SERVICES Ltd	Contracts Advisory services	Kigali	All value chains
56	AGRISEEDS RWANDA Ltd	Vegetable seeds and agri-inputs	Kigali	All value chains
57	HOLLANDA GREEN TECH	Seeds and agri-inputs	Kigali	All value chains
58	AGROTECH	Seeds and agri-inputs	Kigali	All value chains
59	IVF Ltd	Producer of chilli, French beans, tomatoes, etc. Extension services provision	Bugesera District	French beans, eggplant, chilli, hot pepper
60	GCIES Company Ltd	Production of French Beans and tomatoes	Nyagatare District	French beans and tomatoes

61	KAZIHORTI Ltd	Production and export of tomatoes - DRC	Kigali	Tomatoes
62	DAVIS & SHIRTLIFF	Equipment for irrigation	Kigali	Supply and services provision
63	NETAFIM	Extension services provision	Nyagatare District	Vegetables and fruits
64	INKOMOKO BUSINESS DEVELOPMENT CENTER	Business and entrepreneurship skills service provision	Kigali	All value chains
65	BUSINESS PARTNERS NETWORK (BPN)	Business and entrepreneurship skills service provision	Kigali	All value chains
66	DOT RWANDA	Business and entrepreneurship skills service provision	Kigali	All value chains
67	URUGAGA IMBARAGA	Advocacy, Lobbying and capacity building service provision for farmers	Northern Province	All agriculture value chains
68	MINAGRI	Policies, Strategies, orientations and coordination for agriculture and livestock.	Kigali	All agri-value chains
69	MINICOM	Policies, Strategies, Orientations and coordination for commerce in the country.	Kigali	All commerce related activities: Internal and External trade
70	COMMERCIAL BANKS	Financial services provision	Kigali	All financial services
71	URWEGO COMMUNITY BANK	Financial services provision	Kigali	Microfinance
72	DURETIMBERE MICROFINANCE	Financial services provision	Kigali	Microfinance
73	COPEDU	Financial services provision	Kigali	Microfinance

74	VISION FINANCE	Financial services provision	Kigali	Microfinance
75	RAB	Agriculture & Livestock	Kigali	Research and development for agriculture and livestock
76	RDB	Investment for economic growth	Kigali	Technical support, orientations, coordination, policies and strategies for investment promotion
77	RCA	Cooperatives capacity building, evaluation and coordination	Muhanga	Coordination, technical assistance, capacity building, Monitoring and Evaluation, Auditing and research for cooperative development.
78	NAEB (National Agriculture Export Board)	Exports coordination for horticulture	Kigali	Coordination, orientations, technical support, capacity building, market opportunities information and linkages, pack-house, certification, etc.
79	RICA (Rwanda Institute for Conservation Agriculture)	Research, education, and extension services to train Rwanda's next generation of leaders in agriculture, while supporting national priorities for agricultural development	Kigali	Promotion and value the conservation agriculture
80	RSB (Rwanda Standards Board)	Standards of products service provision	Kigali	Certification and standards compliance verification services provision
81	FDA (Rwanda Food and Drugs Authority)	Protection of public health through regulation of human and veterinary medicines, vaccines and other biological products, processed foods, poisons, medicated cosmetics, medical devices, household chemical substances, tobacco and tobacco products.	Kigali	Quality control and standards verification

82	REMA (Rwanda Environment Management Authority)	National environmental protection, conservation, promotion and overall management, including advisory to the government on all matters pertinent to the environment and climate change.	Kigali	Technical support, coordination. supervision, regulation and capacity building
83	RWB	Ensure the availability of enough and well managed water resources for sustainable development.	Kigali	Effective water use in Rwanda
84	MININFRA	Responsible for infrastructure policy and development throughout the country	Kigali	Accessibility of remotes areas where vegetables are produced.
85	District Authorities (all relevant districts)	Directorate of Agriculture & Natural Resources Division of Cash Crops	Kigali City, Northern Province, Southern Province, Eastern Province	Cash Crops
86	FIDELIS LEGAL SERVICES Ltd	Provision of legal services for farmers	Kigali	Professional services provider
87	DAS (Dedicated Agri - Services Private Ltd	Agribusiness technical services provision	Kigali	Professional services provider
88	HEAR (Horticulture Export Association of Rwanda)	Capacity building, lobbying and advocacy, promotion of horticulture sector for export	Kigali	Civil society organisation
89	RURA	Promotion of fair competition, quality of service and development.	Kigali	Support fair trade systems establishment
90	BNR	Ensure and maintain price and financial stability.	Kigali	Financial services policy, strategies and regulations establishment.

91	RISA (Rwanda Information Society Authority)	Digitisation of the Rwandan society through increased usage of information and communication technologies and innovation technology as a cross-cutting enabler for the development of other sectors spearheading Rwanda's digital and social economic transformation.	Kigali	Technical support, coordination, orientation and facilitation services provision
92	METEO Rwanda	Provision an accurate, timely weather and climate information and products for the general welfare of the peoples of Rwanda	Kigali	Information provision related to weather and climate
93	RYAF (Rwanda Youth in Agriculture Forum)	Bring together different youth organizations, individual youth farmers and entrepreneurs in Agriculture Sector.	Kigali	Coordination, capacity building, orientations, business linkages, advocacy and lobbying.
94	NCCR (National Cooperatives Confederation of Rwanda)	Umbrella organization that :  (i) Promotion, and representation the interests of the cooperative movement in Rwanda.  (ii) Support our member Federations, Unions and Primary Cooperatives through capacity development, information sharing, advocacy in collaboration with Partners,  (iii) Ensure that members' cooperatives, unions, and federations are achieving sustainable Development.	Kigali	Provision of the support to its member Federations, Unions, and Primary Cooperatives through Capacity Development, Information sharing, Advocacy, and collaboration with Public, Private, and Civil society organizations at local, regional, and international levels".
95	INGABO ORGANISATION	Improve technical and economic capacities of agricultural producers so that they become competitive players on market	Muhanga District	Create an excellent agri-business environment

96	Radio Huguka	Media: Communication and information for communities especially farmers in remote areas	Muhanga District	Communication and information services provision
97	RFA (Rwanda Forest Authority)	Ensure growth of forest resources, their management and protection for sustainable development purpose	Ngororero District	Provision of technical support, coordination, orientations and capacity building linked with agroforestry, research and development.
98	BDF (Business Development Fund)	Promote investment through supporting SMEs	Kigali	Financial support and capacity building
99	BRD (Development Bank of Rwanda)	Offers financial solutions for enhanced value to the stakeholders	Kigali	Financial and technical support for investment
100	DEYI Ltd	Business advisory services provision Mushrooms production and supply	Kigali	Capacity building and technical support to SHFs specifically for mushrooms
101	YEAN Rwanda (Youth Engagement in Agriculture Network)	Inspiring change for the pursuit of beauty and excellent in young agripreneurs and the community.	Kigali	Spread agriculture information and facts
102	APIB (Association pour la Promotion des initiatives de Base)	Community enterprises empowerment	Musanze	Capacity building and business advisory services provision

## Annex 4. List of key informants

No.	Date	Company / VC node	Location
1	KEZIMANA Abed Nego	One Acre Fund	Kigali
2	MUREKATETE Jolie	Tearfund	Kigali
3	MBONIGABA Eric	Private Sector Federation, Agriculture Cluster	Kigali
4	MUNYANEZA Jean Marie Vianney	National Agricultural Export Development Board (NAEB)	Kigali
5	NSHIMIYIMANA Octave  MUKAMUGEMA Alice	Ministry of Agriculture (MINAGRI)	Kigali
6	HAKIZIMANA Bella	Rwanda Standards Board (RSB)	Kigali
7	TURATSINZE Theoneste  MUKANDAYISENGA Donatile	GWIZA Cooperative	Ramwagana
8	Farmers' Group – Gatunda sector	Producers of Tomatoes	Nyagatare
9	HABINSHUTI Fidele	MEVAT Company Ltd  Exporter/Trader chilli and tomatoes	Nyagatare
11	RWANYABUGIGIRA Justine	GCIES Company Ltd  Production of French Beans and tomatoes	Nyagatare
11	NSEKERABANZI Emmanuel	Smallholder Farmer, Garlic and Onion	Musanze
12	MBATEZIMANA Damien	Shekina, Cassava Leaves Processor	
13	SINA Gerard  KWIHANGANA Patrice	Sina Gerard, Chilli Oil Processor	



14	Retailers of vegetables	Market Trader, Vegetables	Musanze
15	UZAMUKUNDA Alphonsine	Smallholder farmer, Garlic	Rubavu
16	NZABIKIRAMO Pierrot	The STEP COMPANY – Exporter Onion, Carrot	Rubavu
17	Cross-border traders and transporters	Observation at DRC border	Rubavu
18	Retailers of vegetables	Market Trader, Vegetables	Rubavu
19	NSENGIYUMVA Jean Bosco	IVF Ltd, production of french beans, chilli, pepper, eggplant	Bugesera
20	MANIRAGUHA Dieudonne	Cash Crop Officer	Bugesera
21	UMUTESI Olive	Cash Crop Officer	Rwamagana
22	MIGADDE Charlene	SOUK FARMS INVESTMENT	Kigali
23.	Lawyer BIZIYAREMYE Fidele	FIDELIS LEGAL SERVICES Ltd	Kigali
24.	NIYONSHUTI Lambert	DAS (Dedicated Agri Services Private Ltd)	Kigali
25.	NTIYAMIRA Faustin	Gasabo District Directorate of Agriculture and Environment	Kigali
26.	SHUMBUSHO Jean d'Amour	Nyarugenge District Directorate of Agriculture Cash Crops Officer	Kigali
27.	NSABIYUMVA Damien	Kicukiro District Directorate of Agricuyture	Kigali
28.	NDAYAMBAJE Emmanuel	Rulindo District Directorate of Agriculture and Environment Cash Crops Officer	Kigali
29.	TWAHIRWA Jean d'Amour	Huye District Directorate of Agriculture Cash Crops	Southern Province
30.	NGENDA HAYO Jean Damascene	Musanze District Directorate of Agriculture and Natural Resources	Northern Province
31.	NIZEYIMBABAZI Jean de Dieu	Burera District Directorate of Agriculture	Northern Province
32.	NTAMPAKA Antoine de Gonzague	Rusizi District Directorate of Agriculture Cash Crops Officer	Western Province

33.	MUDAHEMUKA Innocent	Ngoma District Directorate of Agriculture and Natural Resources	Eastern Province
34.	FASHINGABO Matthieu	Kirehe District Directorate of Agriculture Cash Crops Officer	Eastern Province
35.	NYIRANSHUTI Marie	Muhanga District Director of Agriculture & Natural Resources	Southern Province
36.	SIBONTEZE Theoneste	Nyanza District Director of Agriculture Cash Crops Officer	Southern Province
37.	NKUBITO Jean Paul	Nyabihu District Director of Agriculture Cash Crops Officer	Western Province
38.	MANIRAGUHA Dieudonne	Bugesera District Directorate of Agriculture Cash Crops Officer	Eastern Province
39.	NYIRANTEBUKA M.	Rubavu District Directorate of Agriculture & Natural resources Cash Crops Officer	Western Province
40.	NEZERWA Issa	Nyagatare District Directorate of Agriculture & Environment Cash Crops Officer	Eastern Province
41.	ABIMANA Marcel	Gatsibo District Directorate of Agriculture Cash Crops Officer	Eastern Province
42.	BIKORIMANA Felicien	Rwamagana District Directorate of Agriculture Cash Crops Officer	Eastern Province
43.	HABIYAKARE Sylvester	Kamonyi District Directorate of Agriculture & Natural Resources Cash Crops Officer	Southern Province
44.	Dr MUNYAMPUNDU Jean Pierre	FDA - RWANDA	Kigali
45.	NIBAGWIRE Donatille	FLORIS RWANDA Exporter – eggplant, potatoe leaves	Kigali
46.	Canslida	Exporter - Tomatoes	Kigali