

# Agricultural value chain analysis for SERVE



**Final report**

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## **Final report**

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# Contents

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<b>Executive summary</b>	<b>14</b>
<b>1. Introduction</b>	<b>18</b>
1.1. Structure of this report	18
1.2. Methodology	18
1.2.1. Literature review and gap analysis	18
1.2.2. Data collection strategy	19
<b>2. Context and common themes</b>	<b>21</b>
2.1.1. Value chain ranking	25
2.1.2. Export market overview	26
2.1.3. Working conditions and employment prospects for women and youth in Rwanda	27
2.1.4. Agricultural extension services	30
<b>3. Risk and vulnerability assessment at the district level</b>	<b>33</b>
3.1.1. The impact of climate change for Rwanda	33
3.1.2. Environmental hazard at district level	34
3.1.3. Mitigation measures and associated costs	42
<b>Thematic Report 1: Market systems</b>	<b>55</b>
<b>4. Market systems analysis: Poultry</b>	<b>56</b>
4.1. Market Mapping	56
4.1.1. Poultry Value Chain	58
4.1.2. Value Chain Nodes	60

4.2.	Risk and Vulnerability Analysis	66
4.2.1.	Ecological Suitability and Environmental Hazards at District Level	66
4.2.2.	Mitigation Measures	68
4.3.	Policy Analysis and Recommendations	69
4.4.	Interventions for implementation	72
<b>5.</b>	<b>Market systems analysis: Chilli</b>	<b>74</b>
5.1.	Market mapping	74
5.1.1.	Chili Value chain	79
5.1.2.	Value Chain Nodes	82
5.2.	Risk and Vulnerability Analysis	94
5.2.1.	Ecological suitability and environmental hazards at district level	95
5.2.2.	Mitigation measures	97
5.3.	Policy Analysis and Recommendations	98
5.4.	Framework to implement the intervention	100
<b>6.</b>	<b>Market systems analysis: Tomato</b>	<b>102</b>
6.1.	Market mapping	102
6.1.1.	Tomato Value chain	107
6.1.2.	Value Chain Nodes	109
6.2.	Risk and Vulnerability Analysis	113
6.2.1.	Ecological suitability and environmental risks	114
6.2.2.	Mitigation measures	117
6.3.	Policy Analysis and Recommendations	120
6.4.	Framework to implement the intervention	120
<b>7.</b>	<b>Market systems analysis: Green beans</b>	<b>123</b>
7.1.	Market Mapping	123
7.1.1.	Green Beans Value Chain	130
7.1.2.	Value Chain Nodes	131
7.2.	Risk and Vulnerability Analysis	138
7.2.1.	Ecological suitability	140
7.2.2.	Mitigation measures	141
7.3.	Policy Analysis and Recommendations	142

7.4.	Framework for implementation	143
<b>8.</b>	<b>Market systems analysis (passionfruit, cabbage, carrot, pineapple)</b>	<b>146</b>
8.1.	Cabbage	146
8.1.1.	Introduction and market size	146
8.1.2.	Value chain steps	147
8.1.3.	Main challenges	149
8.1.4.	Employment opportunities within the value chain	150
8.2.	Carrot	151
8.2.1.	Introduction and market size	151
8.2.2.	Value chain steps	152
8.2.3.	Main challenges	153
8.2.4.	Employment opportunities within the value chain	154
8.3.	Passion fruit	155
8.3.1.	Introduction and market size	155
8.3.2.	Value chain steps	157
8.3.3.	Main challenges	157
8.3.4.	Employment opportunities within the value chain	158
8.4.	Pineapple	159
8.4.1.	Introduction and market size	159
8.4.2.	Value chain steps	160
8.4.3.	Main challenges	161
8.4.4.	Employment opportunities within the value chain	161
	<b>Thematic Report 2: Gender and youth inclusion</b>	<b>162</b>
<b>9.</b>	<b>Gender and youth inclusion analysis</b>	<b>163</b>
9.1.	Introduction and Methodology	163
9.2.	Gender Analysis and Dynamics: Key Gendered Factors Affecting Young Women	167
9.2.1.	Access and Control Over Resources for Youth and Young Women	168
9.2.2.	Gendered social norms (expectations, traditions, family dynamics/impact of family members, double work burden, etc.)	178
9.2.3.	Young women's agency, bargaining power, personal aspirations, and access to decision-making	184

9.2.4.	Gendered impacts of Climate Change	190
9.2.5.	Assessment of intersectional factors and dynamics affecting people with disabilities and refugees	191
9.3.	Key gender issues and inequalities encountered in the selected value chains	198
9.4.	Strategies for female youth, PWD and refugee engagement aligned with CARE's Gender Equality Framework	202
9.4.1.	SERVE project design measures	204
9.4.2.	Improve capabilities and practices in agricultural sector	205
9.4.3.	Improve participation, agency and decision-making power	215
9.4.4.	Risk reduction and adaptation	218
<b>Thematic Report 3: Agriculture financing policy</b>		<b>220</b>
<b>10.</b>	<b>Agriculture financing policy and other policies</b>	<b>221</b>
10.1.	Agriculture Financing Policies, Models and Best Practices	226
10.1.1.	The Agriculture Finance Landscape	226
10.1.2.	The state of financial inclusion	230
10.1.3.	Analysis of Agriculture Financing Policies	235
10.1.4.	Mapping of Existing Interventions by Government and Development Agencies	240
10.1.5.	Analysis of Existing Agri Finance Delivery Models and Products	246
10.1.6.	De-Risking Mechanisms Across Value Chains	253
10.2.	Increasing Access to Agriculture Finance for Youth	254
10.2.1.	Analysis of barriers to access to agriculture finance for women and youth	254
10.2.2.	Recommended Policy Enhancements and Interventions	257
10.2.3.	Suitable Delivery Models and Products for Increasing Access to Agriculture Finance for Youth	258
10.3.	Policy Entitlements for Value Chain Operators	259
10.3.1.	Identification of Existing Agriculture Policy Entitlements	259
10.3.2.	Exploitation Levels and Bottlenecks Encountered	262
10.3.3.	Recommendations for Intervention/Enforcement Approaches to be Deployed Along SERVE Implementation To Close Identified Gaps And Maximize Policy Entitlements	266
10.4.	Environmental Policies and Climate Adaptation	266
10.4.1.	Analysis of Environmental Policies and Climate Adaptation Plans	266
10.4.2.	Practical Interventions for Female Youth in Prioritized Value Chains	269

10.5.	Key Findings and recommendations	270
10.5.1.	Overview of key recommendations	270
10.5.2.	Opportunities and entry points for the Serve project to increase access to finance for women and youth	272
<b>11.</b>	<b>Bibliography</b>	<b>277</b>
<b>12.</b>	<b>References</b>	<b>280</b>
<b>13.</b>	<b>Annex</b>	<b>294</b>
13.1.	Stakeholder consultations	294
13.2.	Survey Instruments	304

## List of figures

---

Figure 1: Area breakdown for field missions .....	19
Figure 2: Value and quantity of total agricultural exports from Rwanda over time .....	26
Figure 3: Employment and productivity in Rwanda by sector .....	28
Figure 4: Drought hazard map of Rwanda (Season B: March to July) .....	37
Figure 5: Drought hazard map of Rwanda (Season A: September to February) .....	38
Figure 6: Soil erosion in Rwanda.....	40
Figure 7: Pesticide prices over time .....	53
Figure 8 Chicken meat and egg production in Rwanda based on FAOSTAT (2010 - 2021) and projection (2022 - 2030) .....	56
Figure 9 Poultry export through formal and informal channels in Rwanda based on NISR (2012-2021) and projection (2022-2030) .....	57
Figure 10 Poultry value chain schematic.....	59
Figure 11 Import value of day-old chicks (a) and exporters of day-old chicks to Rwanda in 2021 (b) .....	60
Figure 12: Chili production, area harvested and yield over time.....	76
Figure 13: Chili exports from Rwanda 2018-2022, comparison of NISR and Comtrade data .....	77
Figure 14: Chili value chain .....	80
Figure 15: Value added for domestic consumption .....	81
Figure 16: Tomato exports over time, comparison of NISR and FAOStat data .....	104
Figure 17: Value added for domestic consumption .....	105
Figure 18: Export of processed tomato products over time.....	106
Figure 19: Simplified tomato value chain schematic.....	107
Figure 20: Current climate suitability for tomato in Rwanda (1981 – 2015) on a 1-100 percent scale .....	114
Figure 21. Production and export of French beans 2015–2019.....	124
Figure 22: French bean value added for domestic and international consumption .....	127
Figure 23 Green bean value chain schematic.....	130
Figure 24: Production and export of cabbages, Rwanda .....	147



Figure 25: Production and export of carrots, Rwanda .....	151
Figure 26: Passion fruit export, quantity, Free on Board (FOB export) value and prices over time .....	156
Figure 27: Production and export of pineapple, Rwanda .....	160
Figure 28: Gender Dimensions .....	163
Figure 29: Gender Dimensions .....	<b>Error! Bookmark not defined.</b>
Figure 30: CARE's Gender Equality Framework .....	165
Figure 31: Levels of financial inclusion .....	230
Figure 32: Schematic overview of the agriculture finance market.....	247

## List of tables

---

Table 1: Overview of consultations '(total interviews held with either individuals or groups) .....	20
Table 2: Value chain ranking criteria .....	22
Table 3: Production level financial benefits and farmer perspective .....	23
Table 4: Nutrition contents of products.....	24
Table 5: Strategic Selection of Value Chains (10 highest, 1 lowest) .....	25
Table 6: Water scarcity and drought risk at district level .....	35
Table 7: Soil erosion in Rwanda .....	40
Table 8. Climate risks and existing production in ten districts in Rwanda .....	41
Table 9: Cost estimates of erosion management measures from field surveys .....	44
Table 10: Costs to produce 2 tons Bokashi.....	46
Table 11: Investment Costs for an SSI Drag Hose System.....	48
Table 12: Investment Costs for FLID Water Harvesting Facilities with a Covered Dam Sheet Reservoir .....	48
Table 13: Cost estimates of irrigation from the field surveys.....	49
Table 14: Investment profile Cold chain logistics company .....	52
Table 15: Number of chickens raised by province in Rwanda .....	57
Table 16: Opportunities and challenges identified by the poultry farmers in five districts in Rwanda .....	62

Table 17: Roles and skill gaps of women and female youth in Rwanda's poultry production.....	63
Table 18: Environmental risks and mitigation measures identified by the poultry farmers in five districts in Rwanda .....	68
Table 19: Policy instruments for poultry sector in Rwanda .....	69
Table 20: Target of district development strategy (2018-2024) for poultry sector in Rwanda .....	71
Table 21: Average annual production (2017, 2018 and 2019) by District, selected field notes on productivity .....	75
Table 22: Use of maturity indices for green chili harvesting twice per week .....	88
Table 23: Use of shade for harvested green chilies in Rwanda during delays and transport .....	89
Table 24: Farmer perspectives on ecological suitability and production risks by District, selected field notes on productivity** .....	95
Table 25: District development strategy targets relevant for horticulture .....	99
Table 26: Average production by District of 2017, 2018 and 2019 .....	103
Table 27: Overview of challenges in tomato production for youth and women .....	112
Table 28: Major risks for tomato production at district level* .....	114
Table 29. Use of maturity indices for tomato harvesting .....	119
Table 30: Use of shade for harvested tomato.....	119
Table 31: Average production by District of 2017, 2018 and 2019 .....	125
Table 32: Green beans data in Bugesera, Rwamagana, Kayanza and Gasabo in Rwanda .....	126
Table 33: Challenges and opportunities for Rwanda to export French beans .....	128
Table 34: Roles and skill gaps of women and youth in green bean value chain .....	137
Table 36: Environmental risks and mitigation measures identified by the green bean farmers in the study area.....	139
Table 37: Suitable Crop Rotation with French Beans .....	141
Table 38: District targets for vegetable/green beans production under district development strategies .....	142
Table 39: Employment opportunities in cabbage value chain .....	150
Table 40: Employment opportunities in carrot value chain .....	155
Table 41: Employment opportunities in the passion fruit value chain.....	158

Table 42: Agriculture as main activity per district .....	168
Table 43: Proposed strategies and interventions .....	202
Table 44: Number of MFIs in SERVE's operational area .....	228
Table 45: Access to DFS inclusion and mobile phone .....	232
Table 46: Farmers' access to finance by district.....	233
Table 47: BRD Loan book broken down by sector for 2022 and 2021 .....	241
Table 48: Outreach: number of approved guarantee projects in 2020 and 2019 .....	242
Table 49: Summary of delivery models .....	252
Table 50: Exploitation levels for policy entitlements .....	262
Table 51: Number of animals and Ha insured under NAIS .....	263
Table 52: Stakeholder consultations.....	294

## List of boxes

---

Box 1: Irrigation in Rwanda .....	47
Box 2: One Acre Fund .....	84
Box 3: Factors and solutions regarding post-harvest loss in Chili production .....	86
Box 4: Pepper .....	95
Box 5: Factors and mitigation methods for post harvest loss in tomato production .....	118
Box 6: Proxi Fresh – french bean exporter.....	136
Box 7: Mixed experiences with U-SACCOs .....	250
Box 8: Smart Nkunganire System (SNS) Platform .....	261
Box 9 – Why Serve should encourage use of existing digital finance infrastructure rather than the development of fully digital loans .....	271
Box 10 – Why SERVE should not establish a credit guarantee facility .....	271

## List of abbreviations

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AMIR	Association of Micro Finance Institutions Rwanda
BMEL	Bundesministerium für Ernährung und Landwirtschaft
BDF	Business Development Fund
BRD	Development Bank of Rwanda
DDS	District Development Strategy
DOC	Day-old-chicks
DRC	Democratic Republic Congo
DUHAMIC-ADRI	DUHaranira AMajyambere y'ICyaro
EbA	Ecosystem-based Adaptation
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
FSC	Forest Stewardship Council
FSSP	Financial Sector Development Strategic Plan 2018-2024
GAP	Good Agricultural Practices
GDP	Gross Domestic Product
GoR	Government of Rwanda
GESI	Gender equality and social inclusion
HS	Harmonized System
M&E	Monitoring & Evaluation
MFI	Monetary Financial Institutions
MINAGRI	Ministry of Agriculture and Animal Resources
MINALOC	Ministry of Local Government
MINECOFIN	Ministry of Finance and Economic Planning
NAEB	National Agriculture Export Development Board
NAP	National Agriculture Policy

NbS	Nature-based Solutions
NAIS	National Agriculture Insurance Scheme
NUDOR	National Union of Disability Organizations in Rwanda
PFTH	Pro-femme Twese Hamwe
PSTA 4	Strategic Plan for the Transformation of Agriculture
PWD	Persons With Disabilities
RAB	Rwanda Agriculture and Animal Resources Development Board
RDB	Rwanda Development Board
RFA	Rwandan Forestry Authority
RWF	Rwandan Franc
ROAM	Restoration Opportunities Assessment Methodology
SAIP	Sustainable Agricultural Intensification and Food security Project
SEDO	Sector Extension and Advisory Officer
SMETA	Sedex Members Ethical Trade Audit
UNHCR	United Nations High Commissioner for Refugees
(U-)SACCO	(Umurenge) Savings and Credit Cooperative
NISR	National Institute of Statistics of Rwanda
WFP	World Food Programme
VSLA	Village Savings and Loan Associations

# Executive summary

As of November 2023, agriculture employs 48 percent of the total labor force in Rwanda (NISR, 2024). Within this sector, the gender gap in productivity persists, with female-managed farms 11.7 percent less productive than male farms<sup>1</sup>. The SERVE project identified four key factors behind this productivity gap: namely; poor business practices, difficulties in accessing agricultural lending, heavy reliance on informal sector lending, and cultural and social norms preventing women and youth from entering and succeeding in the agriculture sector. Addressing these challenges, the SERVE project, aligned with the Mastercard Foundation Young Africa Works strategy, is led by CARE International in collaboration with partners such as DUHAMIC-ADRI, PFTH, AMIR, and Urwego Bank. Over five years, SERVE aims to establish a resilient, sustainable, and gender-equitable entrepreneurial environment in the agricultural sector across ten districts in Rwanda.

With a focus on fostering inclusive growth for youth-led agricultural Micro and Small Enterprises (MSEs), SERVE aims to enhance productivity, access to finance, entrepreneurship, and market linkages in selected value chains. Simultaneously, the project aims to influence policies and social norms to reduce barriers and enhance equity, particularly for female youth. Collaborating with government ministries, civil society organizations, and the private sector, SERVE leverages strategic alliances to develop tailored financial products, bridge the gendered digital divide, and connect female youth with mentors and potential buyers.

Targeting approximately 45,500 female youth, including refugees and those with disabilities, SERVE emphasizes strengthening existing employment opportunities and generating new ones within the agricultural sector for individuals aged 18 to 35. Entry points include existing Village Savings and Loans Associations (VSLAs) and Farmer Groups (FG), primarily comprising young people, as well as exploring youth cooperatives and collective agribusinesses outside the VSLA network.

The aim of this report is to provide a comprehensive market analysis of the targeted value chains of tomatoes, chili, green beans, and poultry, as well as four additional potential value chains. This includes evaluating the current status of gender mainstreaming, and climate adaptation and mitigation efforts across all nodes of the prioritized value chains, as well as a critical examination of existing and projected agricultural financing and environmental policies and climate adaptation plans for National Determined Contributions to be able to set a strategic transformational plan for the prioritized value chains. The report provides information on existing opportunities and constraints across the targeted value chains and about current advantages and challenges within the chosen value chains. The report recommends solutions to overcome obstacles and provide information for practical implementation strategies.

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<sup>1</sup>

<https://www.unwomen.org/sites/default/files/Headquarters/Attachments/Sections/Library/Publications/2019/UN-Women-Policy-brief-11-The-gender-gap-in-agricultural-productivity-in-sub-Saharan-Africa-en.pdf>

**Poultry value chain analysis:** Poultry production in Rwanda has grown significantly, with a 45 percent increase in chicken meat and a 168 percent increase in hen egg production over the past decade. The industry comprises traditional and commercial systems, with the majority of producers relying on local chicken breeds. The poultry value chain involves inputs, farming activities, processing, distribution, and consumption, with 36 percent of the poultry population in the Eastern Province. Imports from various countries supply inputs like feeds, vaccines, and day-old chicks, especially for commercial poultry farming. Women and female youth actively contribute to poultry farming, but skill gaps exist, particularly in animal husbandry management, marketing, and accessing loans. Climate risks, including drought and extreme temperatures, pose challenges to poultry farming, affecting feed availability and causing disease outbreaks. Policy interventions are crucial to address gaps in standard enforcement, certification, feed laws, and housing standards. To enhance the poultry value chain, short/medium-term interventions include training, strengthening veterinary services, accelerating financial mechanisms, and creating an enabling environment for investments. Long-term strategies involve implementing climate mitigation technologies, enhancing animal health measures, and fostering an environment for climate-related investments.

**Chili value chain analysis:** Chili, a high-impact commodity in the PSTA, is cultivated by small-scale and commercial farmers in Rwanda. The industry comprises four main products: pili pili, habanero, Scotch Bonnet chili, and African birds eye chili pepper. Production is concentrated in the Northern and Eastern provinces. Chili offers employment opportunities for women and youth across all nodes of the value chain. According to field interviews, women are seen as being particularly well-suited for nursery activities and harvesting. However, female employment is lacking at storage, market exploration, and service provider nodes. Climate change affects chili production, causing extreme weather events, soil degradation, pests, and diseases. Mitigation measures include small-scale irrigation and flood management, as well as integrated pest management strategies. Skill gaps exist in women and female youth, including financial knowledge, technical skills, business ventures, and market orientation. Interventions to deploy climate mitigation and adaptation strategies include investing in technologies, providing training, and securing financial schemes for climate risks.

**Tomato value chain analysis:** Tomato is a widespread crop, and as such, offers the largest employment opportunity across all demographics in terms of the number of jobs, of any of the value chains assessed. Tomato is also used as both a cash crop and a food source, giving it additional importance for smallholder farmers. While there is scope for the more high end value chain activities such as processing and trying to access export markets, tomato is seen as a low value crop, and it is difficult to extract a price premium for tomato, and also difficult to encourage farmers to make large capital investments into greenhouses for example. The most cost efficient gains in tomato production can be realized in harvest and post harvest improvement, where there are fairly simple and cheap practices and infrastructure improvements that can improve the production system and offer significant employment opportunities simultaneously.

**Green bean value chain analysis:** Green beans present a promising agripreneurship opportunity for young women in Rwanda, offering profitability, job creation, and access to specialized markets, including exports. The study highlights key strategies such as adopting irrigation technology, enhancing pest and disease management, and improving post-harvest handling techniques to maximize production efficiency. Marketing initiatives, quality certification, and the creation of vegetable retail markets prove crucial for success, particularly in the international market. A key risk with green bean development is the lack of local demand. This means that investment in green bean production must be accompanied by an overarching strategy to produce for high end markets. Overall, the green bean value chain in Rwanda holds substantial potential employment opportunities for young women, requiring strategic interventions for sustained success and market competitiveness.

**Gender and Youth inclusion analysis:** The findings of the study reveal varied representation across different agricultural value chains. Women are prominently involved in vegetable and fruit value chains, such as green beans, chili, carrots, and cabbage. In livestock, women are more engaged in poultry production, while cash crops like tomatoes and bananas are predominantly managed by men. Young women are active in poultry farming, contributing to their financial empowerment. In the chili value chain, women are extensively involved in production tasks, while men handle physically demanding activities. Continuous training is recommended for skill enhancement, especially for women. Similar trends are observed in poultry farming, where women play key roles in farming stages, but young female participation is relatively low due to financial constraints. Tomato value chain participation sees women more engaged in production than marketing, with youth in general perceived as showing less interest due to perceived low profitability. Green beans exhibit a gendered division of tasks, with women handling planting and weeding, influenced by cultural norms. Skill gaps in various value chains include knowledge on production increase, disease management, market access, and technology use. Capacity building and training are deemed necessary to address these gaps, emphasizing the need for government and NGO support. Detailed information on each value chain's analysis provides insights into key nodes for intervention, including recommendations for improving capacity building, access to finance, and extension services, particularly for women and youth.

**Environmental risk analysis:** Rwanda's risk and vulnerability assessment highlight environmental hazards linked to climate change at the district level: water scarcity and drought, landslide and erosion, and flood risk. There are four climatic regions with diverse rainfall and temperature patterns. Challenges include increased seasonal variability and long-term climate change.

- **Water Scarcity and Drought Risk:** Despite high rainfall, Rwanda faces water scarcity due to population growth, urbanization, and environmental degradation. Urgent measures needed for water management, irrigation, and monitoring. Eastern provinces, especially Kayonza and Kirehe, are highly susceptible to severe droughts. To address water scarcity, focus should be on measures like low-water crops, implement irrigation, establish early warning systems and integrating resilient crops.



- **Landslide and Erosion Risk:** There are frequent landslides appearing, influenced by rainfall, slope, geology, soil, and land cover, and increased by climate change. The highest susceptibility appears in western provinces, with Nyabihu the most affected. Accurate landslide hazard assessment demands site-specific evaluations with local data. Bench terracing proves cost-effective for landslide and erosion control. Integrating trees in adapted agroforestry systems, akin to flood prevention, contributes to preventing soil loss and erosion.
- **Flood Risk:** Certain districts, including Rulindo, Gakenke, and Rubavu, are vulnerable to flooding. Accurate site-specific assessments are crucial for estimating flood hazards. Mitigation practices like crop rotation and grassed waterways are recommended.

In order to adeptly address and alleviate the environmental and climate risks, Rwanda must proactively embrace various mitigation measures. Farmers employ diverse mitigation strategies in agriculture, focusing on terracing, irrigation, mulching, composting, and innovative methods like bokashi. These measures address soil erosion, water loss, and climate-related risks, including post-harvest losses and pest management.

**Financial analysis:** The findings emphasize the need for targeted interventions and integrated recommendations. Specifically, the study suggests increasing overall agriculture lending by persuading the National Bank of Rwanda to set sector lending targets. It recommends addressing barriers for women and youth through financial education, digital financial services, and innovative collateral-free product design, with a focus on linking informal and formal financial sectors. Additionally, the study highlights the importance of enhancing awareness of policy entitlements through financial education programs and coaching assistance. Lastly, the outcomes stress the significance of integrating climate change resilience measures across various aspects of the project, including access to improved inputs, on-farm water management, and the design of irrigation loans. The proposed finance program targets empowering women and youth in agriculture through comprehensive financial education and access to collateral-free agriculture loans. Financial institutions, chosen carefully, will facilitate convenient disbursements and repayments via mobile money. Women and youth can access loans directly, through linkage programs with financial institutions or by joining Village Savings and Loans Associations (VSLAs). A support system, including coaches, ensures access to policy entitlements. The program acknowledges the need for improved seeds and irrigation solutions. Key actions include implementing a holistic financial education program, collaborating with Partner Institutions for loan projects, expanding linkages, and lobbying for institutional support. Coordination mechanisms will enhance collaboration with other projects and stakeholders for program success.

# 1. Introduction

## 1.1. Structure of this report

This report is divided into three thematic areas:

- Agricultural market systems
- Gender equality and youth inclusion
- Agriculture financing policy

The first three chapters contain general information relevant to the market systems analysis of all the value chains. Chapter 1 provide an introduction to the report and the methodology. Chapter 2 provides a broad overview of the headline findings regarding value chain selection, as well as Rwandan economic growth and potential with the export market as well as a section on labor markets and conditions in Rwanda. Chapter 3 contains a climate risk and vulnerability assessment including mitigation measures. Chapter 2 and 3 are stand-alone pieces that provide general information relevant to all of the value chains and agricultural production systems in Rwanda.<sup>2</sup>

**Thematic report 1** (Chapter 4-8) contains a chapter on each of the four headline value chains, as well as one chapter looking briefly at the additional value chains. **Thematic report 2** (Chapter 9) contains an analysis of the gender and youth inclusion across these value chains and in Rwanda. **Thematic report 3** (Chapter 10) contains findings from the analysis of agricultural financing policy.

## 1.2. Methodology

### 1.2.1. Literature review and gap analysis

At the inception stage of the report, the consulting team conducted a literature review and gap analysis. The literature review and gap analysis identified relevant, current sources of information and analyzed these for information pertaining to the research questions in the terms of reference. Gaps were then identified for each of the research questions. Unfortunately, district level information was lacking across all of the value chains (aside from production information and some very sparse information on female and youth employment within specific cooperatives).

Survey instruments were developed to gather information from various stakeholder types including farmers, value chain actors, processors, wholesalers and retailers, government

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<sup>2</sup> To avoid repetition of risk analysis and mitigation measures in each value chain chapter. Within each value chain chapter this issue is revisited for value chain specific risks and mitigation measures.

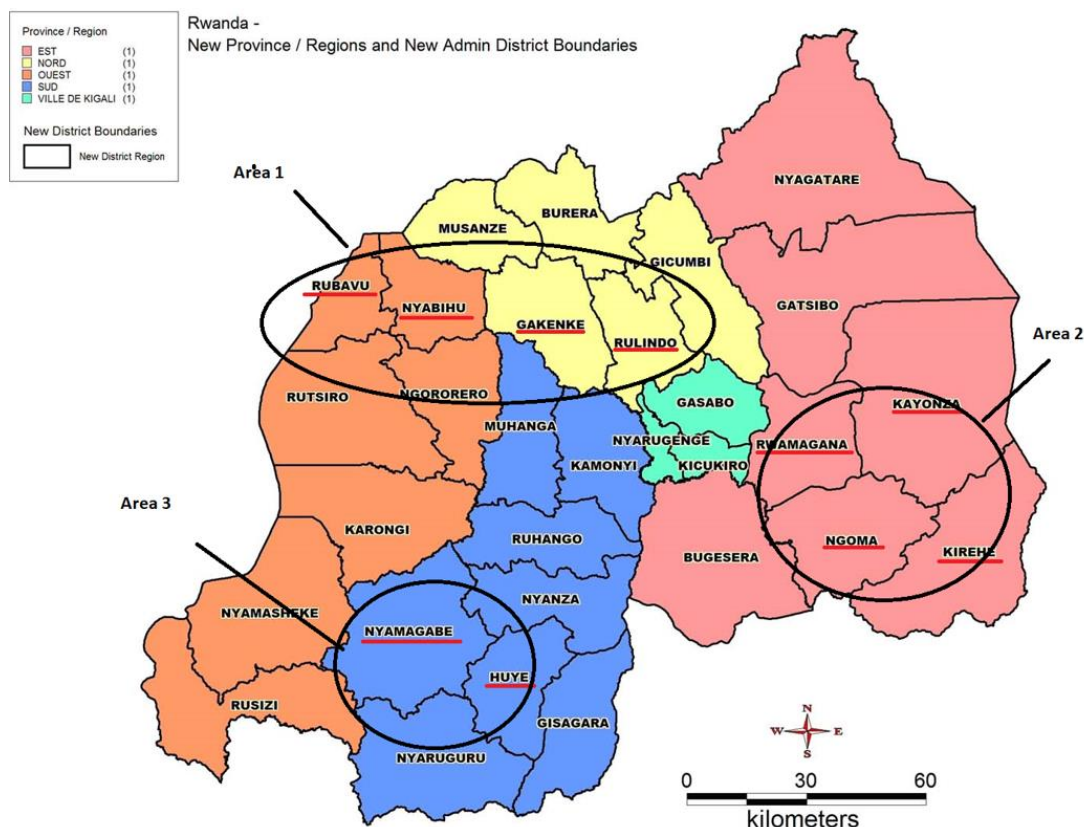
representatives and other key stakeholders. The survey instruments can be found in Annex 13.

## 1.2.2. Data collection strategy

Each value chain analysis was developed in conjunction with a team of national consultants who were trained on the methodology, as well as with representatives of the partner organizations in Rwanda. The study involved a multi-faceted approach, combining literature review, with site visits, local consultations, and field interviews,

The field mission included a one-week field mission in Kigali by an international consultant, complemented by field missions to the various districts over November and early December 2023. Field missions were facilitated through the farmer networks of DUHaranira AMA-jyambere y'ICyaro (DUHAMIC-ADRI). Remote interviews were also conducted with representatives from key organizations such as Association of Microfinance Institutions in Rwanda (AMIR), Urwego Bank, and Acre Africa and the National Union of Disability Organizations in Rwanda (NUDOR). The survey instruments utilized are detailed in the annex, as well as the full list of interviewees in Table 51.

The itinerary covered the different geographic areas, as well as all the provinces and key value chains. We have included border regions to explore the export node of the value chain in more depth, as this is highlighted by the FAO and SNV as particularly interesting for female youth workers (Van Keulen et al., 2022). Figure 1 shows the areas where field missions were conducted.



**Figure 1: Area breakdown for field missions**

The study targeted a diverse range of stakeholders. Key stakeholders included women's groups, farmer groups with a mix of male and female respondents, value chain actors, financial institutions, government officials, and existing projects that strive for similar outcomes to the SERVE project. This was designed to capture a comprehensive spectrum of perspectives and experiences. Interviews were also conducted in the Mahama Refugee Camp in Kirehe. An overview of the consultations is provided in Table 1. For a breakdown of the total number of people interviewed by gender please see Annex 13.1.

**Table 1: Overview of consultations '(total interviews held with either individuals or groups)**

Province	District	Value chains	Government officials	Farmer/ Women / Retailer /Processor	Key stakeholders	Total
National	N/A	N/A	3	N/A	15	18
Northern	Rulindo	Chili, Tomato	1	11	1	13
Northern	Gakenke	Chili, Green bean	1	9	3	13
Western	Rubavu	Alternative (cabbage or carrot)	1	6	1	8
Eastern	Rwamagana	Chili, Tomato, Green bean	1	5	-	6
Eastern	Kirehe	Tomato, Poultry	1	8	1	10
Southern	Huye	Tomato, Green bean	2	4	1	7
Western	Nyabihu	Tomato	1	2	2	5
Eastern	Kayonza	Chili, tomato	1	2	-	3
Eastern	Ngoma	Tomato	1	4	-	5
Southern	Nyamagabe	Green bean	1	4	1	6
<b>Total</b>			<b>14</b>	<b>55</b>	<b>25</b>	<b>94</b>

## 2. Context and common themes

**Rwanda has achieved impressive economic growth over the past three decades.** Rwanda is a small, landlocked country of approximately 13 million people as of 2022.<sup>3</sup> It borders the Democratic Republic of Congo, and East African neighbors, Tanzania, Uganda, and Burundi. Rwanda has averaged an impressive GDP growth rate of 7.3 percent over the past two decades to 2022 and aspires to Middle Income Country status by 2035 and High-Income Country status by 2050. The government aims to achieve this through a series of seven-year National Strategies for Transformation (NST1), underpinned by sectoral strategies focused on meeting the UN's Sustainable Development Goals (SDGs).

**Smallholders in Rwanda remain among the poorest and most vulnerable people in the world.** While Rwanda has performed very well on a number of key development indicators such as poverty reduction, (from 75.2 percent in 2000 to 52 percent in 2016)<sup>4</sup>, life expectancy (from 49 years in 2000 to 67 years in 2018) and education (average school years went from 7.2 in 2000 to 11.2 in 2017)<sup>5</sup>, it is important to recognize that Rwanda remains a relatively poor country by global standards<sup>6</sup>, and that smallholder farmers are a particularly vulnerable group for whom the risks associated with innovative production methods or newly introduced crops are amplified. Therefore, is important to nest potential interventions within the context of familiar production systems and crops that are tried and tested in the agroecological climate as well as the local, regional, and international markets available to those farmers.

**Rwanda has excellent growing conditions for many crops.** The PSTA 4 Strategy highlights in particular the role of fast growth horticultural crops, including pyrethrum, French bean, snow pea, passion fruit, chili, cut flowers, as well as stevia and essential oils. The Strategy also highlights the need to further expand traditional export crops of such as tea and coffee through specialty breeds or through organic certification. Aside from this overarching document, there are many available studies which assess the competitive potential of different crops in Rwanda. For example, a recent paper by World Vision (2018) identified several value chains with strong potential: namely avocado, mango, tree tomato, maize, beans, as well as several livestock species including goats, pigs, cattle and beekeeping (World Vision & Australian Aid, 2018). USAID 2018 also looked at the commercial potential for snow pea, passion fruit, chilli, mushroom, macadamia, farmed fish and pineapple as other alternatives (USAID, 2018a).

**This study has focused on the green beans, tomatoes, chili, and poultry value chains.** These four value chains were identified by CARE Rwanda, which were selected in turn based on

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<sup>3</sup>[https://www.worldbank.org/en/country/rwanda/overview#:~:text=Small%20and%20landlocked%2C%20Rwanda%20is,13%20million%20people%20\(2022\)](https://www.worldbank.org/en/country/rwanda/overview#:~:text=Small%20and%20landlocked%2C%20Rwanda%20is,13%20million%20people%20(2022)) .

<sup>4</sup> <https://www.worldbank.org/en/country/rwanda/overview>

<sup>5</sup> <https://hdr.undp.org/system/files/documents/nhdr2020ruwandasummarypdf.pdf>

<sup>6</sup> Ranked 165th globally in terms of Human Development Indicators: <https://hdr.undp.org/data-center/country-insights#/ranks>, and ranked 80th out of 101 nations in the World Bank Enabling the Business of Agriculture score in 2019 (the most recent date for which data are available) <https://eba.worldbank.org/en/data/exploretopics/all-topics>

an analysis of the prominence of value chains in the target districts and “as determined by the central level in cooperation with districts and district agricultural plans (MINAGRI)”<sup>7</sup>. In addition to these four value chains, the study also identified and made a preliminary assessment of passion fruit, cabbage, carrot, and pineapple.

**The value chains have been ranked according to multiple criteria to determine the areas with the greatest potential benefits.** We employed a Criteria-Based Ranking of Value Chains, assessing economic, nutrition, gender, institutional, and environmental factors, including district-specific performance ranking. Value chains have been given a score out of ten (10 highest, 0 lowest) based on the performance of each value chain as measured against the criteria. Please note that this is a subjective measure to some degree based on available evidence including literature review and field notes.

**Table 2: Value chain ranking criteria**

Criteria	Rationale	Indicators	Sources
Income potential	To incentivize Farmers, it is critical to select value chains that offer return on investment within a realistic timeframe	Profit margin, return on investment, payback period	Literature review
Market potential and competitiveness	Market potential is important for uptake, sustainability, and upscaling potential of value chains	Market size, market growth, price competitiveness	Literature review/ FAOStat, Comtrade data, NISR data, District Official data
Gender and Youth participation, potential, and impact	To ensure equitable and sustainable value chain development positive gender and youth impacts are critical	Proportion male/female in production Proportion youth/adult in production Role of women/youth in value chain	Literature review/ NISR data, District Official data/Qualitative survey evidence
Institutional support	To determine the level of government support available to value chain actors and awareness, capacity constraints particularly wrt. predominantly female youth	Number of policies and extent of financial and other support	Literature review, qualitative survey evidence
Nutrition	To ensure healthy and sustainable value chain development, also to ensure value chains provide multiple benefits, both financial and nutritional	Nutritional benefits of the various value chains, suitability for subsistence small-holder farmers	<a href="https://www.myfooddata.com/">https://www.myfooddata.com/</a>

<sup>7</sup> SERVE Proposal

Criteria	Rationale	Indicators	Sources
Climate change impact (adaptation and mitigation) Other environmental benefits	Consideration of climate impacts is important from both a resilience perspective in terms of expected changes, as well as a mitigation point of view. Other environmental impacts are difficult to measure but are very important for farmers	Extreme weather (drought and flood) tolerance. GHG emissions at the production level Soil erosion, water purification, soil quality impacts, air pollution	Literature review

Source: Own elaboration

**The profitability of agricultural production is notoriously fickle, and financial benefits of the different modalities are very difficult to predict. There is tremendous variation by district, seasonality, farmer, and pure luck with regard to the impact of pest and disease.** It was beyond the scope of this study to collect and analyze production cost and revenue data in a systematic way for each of the value chains. However, based on available literature we have compiled a set of key indicators which are presented in Table 3. Not all of the studies are from Rwanda – where not this is indicated in the table. However, the important thing is that these figures give an indication of the per hectare costs for the establishment of each of the different value chains and an indication of the expected gross margin over the initial periods of production. For poultry production, the system and costs represent broiler production for a small coop with capacity for 100 chickens. All figures have been converted to 2023 RwF, and “are”(100 m<sup>2</sup>) have been converted to hectares to allow for consistent comparison between value chains. Table 3 shows that gross margins are highest for passionfruit, chili, and tomato.

**Table 3: Production level financial benefits and farmer perspective**

Crop	Establishment cost per hectare	Margin per hectare (avg. first 1-5 years)	Farmer perspective on profitability	Rating	Source
Chili	6,086,574	5,458,933	Very good	9	(Van Keulen et al., 2022)
Passion fruit	11,189,965	6,595,975	Mixed responses (high capital costs)	7	(Van Keulen et al., 2022)
Tomato	6,522,851	5,752,216	Very good	9	(Van Keulen et al., 2022)
Green bean	3,879,062	2,593,888	Generally positive due to short turn-around	8	(Van Keulen et al., 2022)
Poultry*	2,772,556	65,828	Mixed responses	5	(Orimadegun, 2021)

Crop	Establishment cost per hectare	Margin per hectare (avg. first 1-5 years)	Farmer perspective on profitability	Rating	Source
Cabbage	493,600	306,400	Good – cheap input requirements	6	(Maniriho, 2013)
Carrot**	2,015,622	1,971,865	Very good – cheap input requirements and fast turn-around	6	(Sapkota et al., 2020)
Pineapple***	5,469,676	3,114,406	N/A	5	(Saha et al., 2023)

Source: For farmer perspective the field notes regarding profitability from field interviews were used. As listed \* For smallholder broiler production in Rwanda including construction of chicken coop, drinkers feeders etc. and an average size of 100 chickens per cycle (5 cycles per annum). \*\*Study from Chitwan province Nepal. \*\*\* Study from Bangladesh

Nutrition scores are based on the basic nutrition provided by the foods as listed in #. This basic comparison of the nutrients within comparable servings of each product provides a basic overview of the nutritional differences however nutrition is obviously much more complicated and each of these products offers minerals and vitamins that are not reflected here. Poultry is clearly superior among the metrics considered.

**Table 4: Nutrition contents of products**

Products	Serving	Calories (k per serving)	Fat (grams)	Carbohydrate (grams)	Protein (grams)	Score
Green chilli pepper	1 cup	29	0	6	1	1
Poultry	Raw leg	736	55	0	5	10
Green beans	1 cup	28	0	6	2	1
Passion fruit	1 cup	229	2	55	5	3
Tomatoes	1 cup	27	0	6	1	1
Cabbage	1 cup	22	0	5	1	1
Carrots	1 large	30	0	7	1	1
Pineapple	1 cup	83	0	21	1	2

Source: <https://www.myfooddata.com/>



### 2.1.1. Value chain ranking

Table 5 shows the ranking of the different value chains according to the selection criteria. The scores reflect a subjective judgement of the authors based on the available information from literature, data, and field surveys. The purpose of this table is to provide a ranking of the selected value chains according to the multi-criteria analysis to assess their respective strengths and weaknesses. For Institutional support there was no strong evidence from the field interviews regarding the additional value chains. Given this, they have all been scored at the same low level, reflecting the lack of extension services and policy support for these value chains. While all of the crops face similar issues regarding climate change, aside from the nitrogen-fixing benefits of beans, cabbage and carrot, there are no strong environmental benefits associated with any of these products. As such the environmental scores are mainly based on the potential production risks faced. As discussed in the text, poultry also faces significant climate risks.

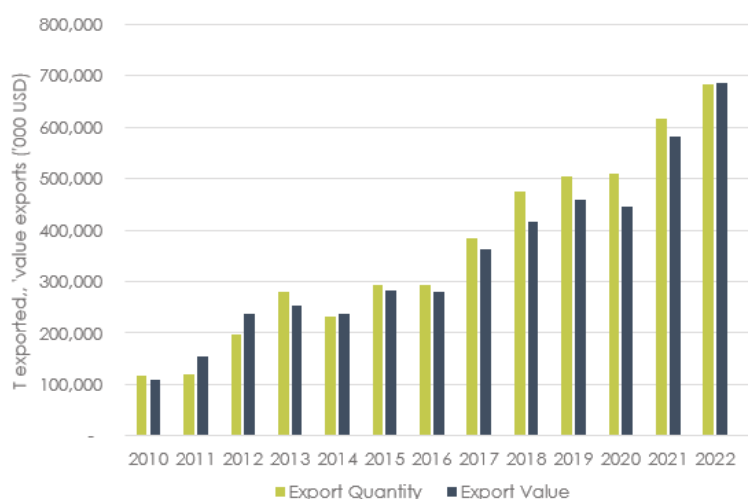
**Table 5: Strategic Selection of Value Chains (10 highest, 1 lowest)**

Value chain	Income potential	Market potential and competitiveness	Gender and Youth participation, potential, and impact	Institutional support	Nutrition	Climate change impact (adaptation and mitigation) and other environmental benefits	Overall score
Poultry	5	8	9	5	10	1	38
Chili	9	9	8	4	1	3	34
Green bean	8	9	8	4	1	4	34
Tomato	9	7	8	2	1	3	30
Passion fruit	7	8	7	1	3	2	28
Carrot	6	6	8	1	1	3	25
Cabbage	6	4	8	1	1	3	23
Pineapple	5	6	7	1	2	2	23

Source: Various – see Table 3 and Table 4 as well as each value chain for details

## 2.1.2. Export market overview

Despite the recent growth and positive economic performance of Rwanda over the past two decades, the formal sector participation of Rwanda in global value chains remains “remarkably low” with only 41 firms in the agriculture sector exporting in 2016, and of those only 22 were exporting more than 100,000 US\$ worth of goods per annum (Frazer & Van Biesebroeck, 2019).<sup>8</sup> While these figures are somewhat out of date and it can be assumed that the figure is significantly higher in 2024 (see Figure 2), the absolute number of opportunities for smallholder farmers to access export markets remains limited. This is also shown in the statistics on domestic production versus exports, which show that exports are only a small fraction of what is produced, for most of the crops in this study.



**Figure 2: Value and quantity of total agricultural exports from Rwanda over time**

Source: FAOSTat<sup>9</sup>

**The requirements for formal sector exports are stringent and there are very high associated fixed costs for smallholder.** These costs include for example transportation infrastructure, searching for potential clients, adjusting the product to foreign market requirements, familiarizing oneself with customs procedures, etc. Further, Rwanda has a highly seasonal climate meaning that exporting firms struggle to attain sufficient quantities to justify the outlays associated with meeting export market requirements.

<sup>8</sup> Note that the study limited the number exporting firms to those exporting more than 10,000 US\$ per annum.

<sup>9</sup> <https://www.fao.org/faostat/en/#data/TCL>

**Meeting standards requirements can be prohibitively costly and difficult for the vast majority of smallholder farmers and field interviews indicate very low levels of certification among producers.** Exporting companies typically have achieved certification in Global GAP, Sedex Members Ethical Trade Audit (SMETA), as well as others such as Hazard Analysis and Critical Control Point (HACCP) and others. Food safety standards are enforced when exporting to the European market, including BRC (British Retail Consortium) and IFS (International Featured Standards). Phytosanitary Certificates for fresh vegetable produce are issued by the Rwanda Inspectorate, Competition and Consumer Protection Authority (RICA) and in the case of animal exports by the Rwanda Agriculture and Livestock Inspection and Certification Services (RALIS).<sup>10</sup>.

**In the early stages of the SERVE project, it may be more prudent to target the “low hanging fruit” or simple interventions that yield high returns and involve low risk and low capital investment requirements.** Despite the difficulties associated with accessing export markets and the low level of participation in these markets among interviewed farmer groups, there is a significant opportunity for value chain development to target these markets. Accessing export markets could be seen as a medium or long term goal of the project, however there are many opportunities for gains within the existing market structure and these should be targeted first.

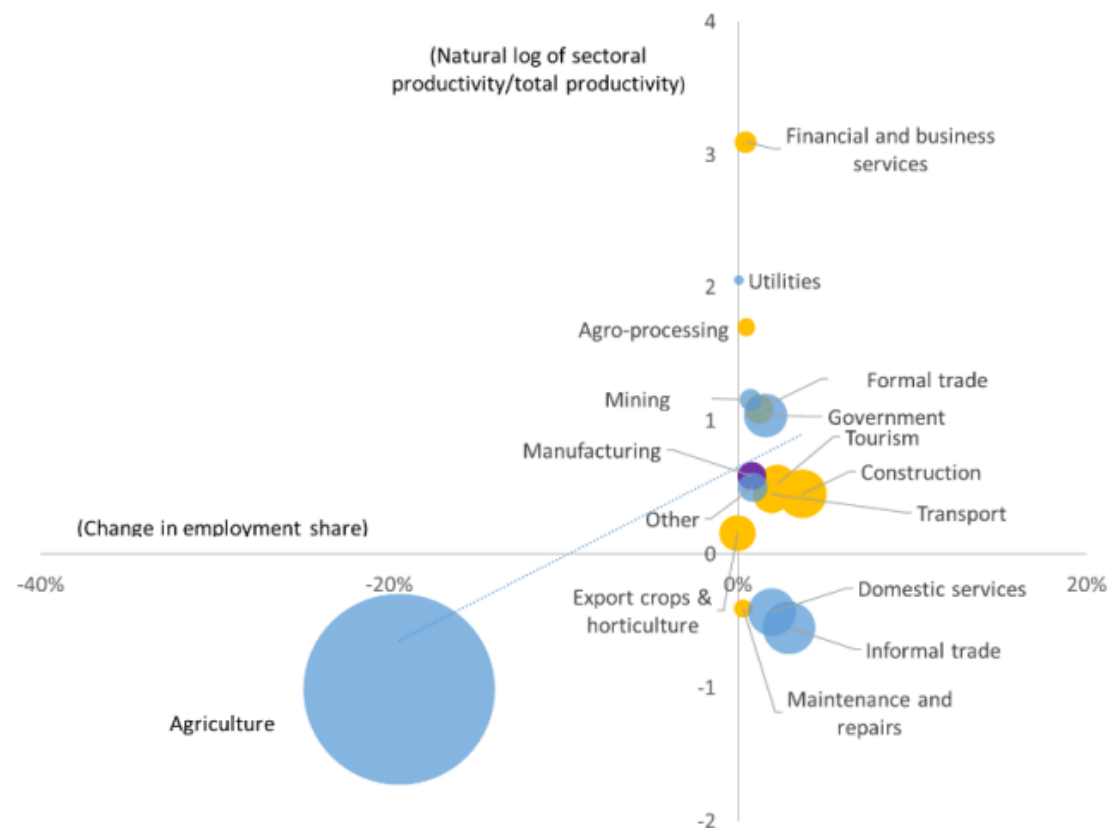
### **2.1.3. Working conditions and employment prospects for women and youth in Rwanda**

**In Rwanda, there has been a very strong downward trend in the share of the total population working in agriculture over the past two decades**, with the share dropping from 89 percent in 2000, to 55 percent in 2021<sup>11</sup>. Figure 3 shows the transition and scale of this trend and the sectors to which workers have moved. In almost all cases, workers have moved to sectors with higher productivity per worker. It is important to note the scale of the “agro-processing” industry (35,000), and the “export crops and horticulture” industry (140,000), as compared to a total of nearly 4 million workers. While the absolute numbers are small, both of these sectors grew strongly in the years from 2001-2017 by 3 percent per annum (agro processing) and 9 percent per annum (export crops and horticulture). Compared to agriculture more broadly, productivity per worker is higher in these sectors.

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<sup>10</sup> <https://naeb.gov.rw/index.php?id=265>, <https://rwandatrade.rw/procedure/37/step/44?embed=false&includeSearch=false&l=en>

<sup>11</sup> See [World Bank Website](#). Note, as of 2023 according to the latest NISR statistics this number is only 48% (NISR, 2024)



**Figure 3: Employment and productivity in Rwanda by sector**

Source: (Newfarmer & Twum, 2022)

**Within the agriculture sector, informal labour and subsistence farming remain the dominant forms of employment.** While there are no definitive up to date statistics on informal sector employment within the agriculture sector, 51 percent of workers within the agriculture sector are involved in subsistence farming (NISR, 2024) and are not considered part of the employed labour force. For agricultural workers, there remains a high degree of uncertainty with regard to employment contracts. Nearly all (99 percent) of these workers are hired without any written contract, with 76.9 percent being employed irregularly through oral agreements or on-demand. Almost all agricultural workers (98 percent) work on a daily basis, with only a small fraction (2 percent) employed seasonally (Bigler et al., 2017).<sup>12</sup> In 2017 it was also found that women earned around 20 percent less than men for the same amount of hours worked.

A job held by an employee is considered informal, if the job does not entail social security contribution by the employer, and is not entitled

<sup>12</sup> Although somewhat dated, the 2017 study on agricultural transformation by Bigler et al. remains the most comprehensive source for information on labour conditions in Rwanda.

to paid sick leave and paid annual leave. If own-account workers (without hired workers) and employers (with hired workers) operate an informal enterprise, they are classified as informal workers. All contributing family workers in formal or informal sector businesses are classified as having informal employment

(NISR, 2017)

**The minimum wage in Rwanda was established in 1974 but has not kept pace with inflation and economic growth, meaning that it does not play a role in securing incomes for Rwandan workers<sup>13</sup>.** In 2018, the law regulating Labour in Rwanda was revised and published in the Official Gazette.<sup>14</sup> As of 2020, the monthly salary in the agricultural sector in Rwanda was 22 USD, which equates to roughly 1 USD per day (DTDA, 2022). Conditions provide a standard work week of 45 hours and 19.3 days of paid annual leave, however violations of wages, overtime and occupational health and safety standards are common in both the formal and informal economy (DTDA, 2022).

**Rwanda has improved child laws, aligning them with international standards like the Convention on the Rights of the Child.** The country prohibits various forms of child labor, discrimination, forced labor, and sexual harassment. The minimum age for employment is 16, but children can start light work at 13-15 under apprenticeships, provided it does not harm their well-being. Despite poverty-driven child labor, Rwanda's rates are lower than the African average, with efforts focused on education and reducing child labor among older children. In 2017, the rate of child labor was estimated at less than 0.3 percent for children aged 5 to 12 (DTDA, 2022).

**Rwanda has advanced institutions to ensure the representation of women** in decision making within government, and within social institutions such as cooperatives or VSLAs. The Labour Law provides equal opportunities and equal pay for women and men. It prohibits gender-based violence, harassment, and discrimination on gender, marital status or family responsibilities (DTDA, 2022). There is also a strong policy framework in place to support youth employment and the transition away from agriculture into the service sector and other parts of the economy. This includes important policy documents such as:

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<sup>13</sup> As of 2020, the minimum wage rate was 2.2 USD per month (DTDA, 2022)

<sup>14</sup> <https://www.mifotra.gov.rw/news-detail/a-new-labour-law-has-been-published>

#### **The National Strategy for Transformation (NST1) (2017–2024)**

**The National Agriculture Policy (NAP) (2017)** promotes the development of the agri-food economy, emphasizing the role of the private sector, and promoting inclusiveness and better participation of women and youth in agriculture programs.

**The Strategic plan for agriculture transformation (PSTA 4) (2018–2024)**, which implements the NAP

**The Gender and Youth Mainstreaming in Agriculture Strategy (2019–2026)** aims to enhance the youth and women inclusiveness of the PSTA4 actions and investments.

#### **2.1.4. Agricultural extension services**

**A key element in improving the outcomes of smallholder farmers in Rwanda is the extent and effectiveness of extension services.** In 2014, Rwanda adopted the "Twigire Muhinzi extension model," a decentralized farming system. It combines farmer promoters who spread basic messages to all farmers and Farmer Field Schools, which offer more detailed training on specific crops at the village and cell levels, respectively (MINAGRI, 2020). Many Rwandan farmers cultivate multiple crops as a precautionary measure against potential crop failures. The FFS approach under Twigire Muhinzi focuses on priority food crops (bananas, wheat, maize, rice, Irish potato, cassava, soya beans, and beans), cash crops (coffee, horticulture) and livestock priority (dairy and meat) value (Neza et al., 2021). Enabling policies in agriculture focus on promoting agricultural intensification – crop intensification program (CIP) and livestock intensification Programme (LIP)—and production of a small number of targeted commodities, which is a central strategy to pursue the joint policy goals of economic growth, food security and livelihood development (Kim et al., 2022).

**Farmers and facilitators of Farmer Field Schools (FFS) across the four provinces have gained technical skills through their involvement in FFS groups under the Twigire Muhinzi program.** These acquired technical competencies include: (i) proficiency in Good Agricultural Practices (GAPs), such as proper plant spacing; (ii) managing soil fertility by employing suitable quantities of farmyard or compost manure and fertilizers; (iii) implementing integrated pest and disease management strategies for crops; and (iv) adhering to seasonal farming schedules and conducting regular farm observations and visits (using the agroecosystem analysis model) (Neza et al., 2021). **The number of farmers reached under Twigire Muhinzi is constrained by available financing** and is usually a small number as compared to the planned number (Neza et al., 2021). The program is not currently able to offer financial compensation to farmer promoters and FFS Facilitators, and instead offers clothing apparel and farming equipment (MINAGRI, 2020).

The **Customized Agricultural Extension system (CAES)** builds on current Twigiri Muhinzi model and is designed to addressing the problems and gaps in the public extension system. CAES is designed to include private sector actors and knowledge institutions in to build the capacity of all actors in the value chain with regard to new technologies, sustainably increasing farmer productivity and profitability and thereby improve Rwanda's food security and income (MINAGRI, 2020). CAES also provides a clear orientation toward transformation of the agricultural sector via strengthening the commercialization of crops and animal resource value chains, such as fruits, vegetables, dairy products in addition to cereals among others. In addition to building on what is existing under CIP and LIP value chains, CAES covers export crops (coffee, tea, vegetables, etc.). CAES integrate crop and animal resources extension approaches where the FFS model will be applied to enhance livestock productivity. Involving green bean production in CAES, it is expected to benefit from crop-livestock integration through animal manure in soil fertility management and the role of livestock as complementary livelihood assets to green bean farming.

**At district level, agricultural programs aiming at ensuring accessibility and affordability of agricultural inputs including Nkunganire, Twigire Muhinzi programs among others are integrated with the CAES system.** However, while the approach may be successful at production level using farmer field school (FFS) approach, it is still not clear whether the same approach is implemented properly with respect to vegetables and poultry production. Furthermore, it should be beneficial if, under CAES, the FFS approach and Twigire Muhinzi TWIGIRE MUHINZI model should cover post-harvest handling, pest and diseases control, and certification of green beans. The CAES proposes agriculture and livestock extension committees from district to the village level, where planning and implementations are done based on performance contracts and districts development strategies (DDSs). The study found that various initiatives in the area of rural finance are promoted at district level to cover the purchase of inputs (DDS\_Kayonza, 2018-2024). The national agriculture insurance scheme (NAIS) covers major crops and vegetables such as chili and green beans (MINAGRI, 2023). However, the District Development Strategies do not contain specific targets for the crops within the study (aside from poultry production. The Rwanda Development Board [RDB, 2023] shows that investment in the commercial horticulture sector has seen rapid expansion in export markets, making up over 50 percent of nontraditional exports and raising export revenue from USD 5 million in 2005 to USD 25 million in 2018.

**While there is, in principle, high demand for agricultural extension officers and agronomists among smallholder farmers, there is less capacity to self-fund such trainings and there are limited funds and places available within funded programs.** Further opportunities exist in the areas of logistics, marketing, and export consulting. However, there

are a large number of successful training organizations and youth focused agribusiness organizations in Rwanda<sup>15</sup>. One of the most prominent, the Rwanda Youth in Agribusiness Forum (RYAF), offer training programs with young agripreneurs, by placing them with established companies to experience learning with a practical skills focus. RYAF stated that they have a gender policy in place and that 55 percent of applicants to their programs are female. Currently the Rural Youth Employment Support (R-YES) Project is one of the major initiatives of RYAF.

The success of extension services for the value chains in this study are discussed briefly in each of the thematic reports, and the extent of extension service provision is explored in detail in section 10.3.2.

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<sup>15</sup> Harambee Youth Employment Accelerator, Horticulture in Reality Cooperative (HoReCo) AgriWin Ltd, Young Professionals for Agricultural Development (YPARD) Rwanda, Youth Connekt national programme, Youth Ecobrigade programme, Youth Engagement in Agriculture Network (YEAN), Knowledge Lab (K-Lab)



### 3. Risk and vulnerability assessment at the district level

Rwanda has a tropical climate characterized by a rolling landscape that stretches from east to west. The country encompasses four distinct climatic regions: the eastern plains, the central plateau, the highlands, and the areas surrounding Lake Kivu. The eastern plains receive annual rainfall ranging from 700 mm to 1,100 mm, with average temperatures ranging from 20°C to 22°C. Moving to the central plateau, this region enjoys rainfall between 1,100 mm and 1,300 mm, accompanied by an annual average temperature of 18°C to 20°C. The highlands, which include the Congo-Nile Ridge and the Birunga volcanic chains, experience annual rainfall ranging from 1,300 mm to 1,600 mm and annual mean temperatures ranging from 10°C to 18°C. In the regions around Lake Kivu and the Bugarama plains, annual rainfall averages between 1,200 mm and 1,500 mm, and annual mean temperatures range from 18°C to 22°C (World Bank Group, 2021).

The country has four distinct climatic seasons: the long rainy season from March to May, the short rainy season from September to November, the long dry season from June to August, and the short dry season from December to February. Rwanda faces the challenges of increased seasonal variability and longer-term climate change (World Bank Group, 2021).

#### 3.1.1. The impact of climate change for Rwanda

In Rwanda, fluctuations in climate from year to year and decade to decade, coupled with limited historical data, have posed challenges in accurately discerning climate patterns within the country. From available data, there has been **a 0.29°C per decade increase in regional temperatures** over the three decades from 1985 to 2015 (World Bank Group, 2021). In Rwanda, precipitation patterns have exhibited notable shifts since the 1960s, marked by **an uptick in extreme rainfall events** across different parts of the nation. From 1961 to 2016, annual rainfall in Rwanda has displayed **considerable variability**. During this timeframe, there has been a notable **decrease in mean rainfall in January, February, May, and June, contrasted with a significant increase from September to December across the country**. The eastern region of Rwanda has witnessed frequent periods of drought over this period. Conversely, the northern and western provinces have experienced shorter, more intense rainy seasons, leading to heightened erosion risks in

the mountainous terrain. Moreover, there have been instances of both severe rainfall deficits and excesses in the eastern regions throughout certain years.

The IPCC anticipates that the risk and intensity of flooding will increase through greater frequency and intensity of rainfall events. Additionally, episodes of drought are expected to increase in the central and eastern areas. **Disruptions due to natural disasters can result in famine, population displacement, conflict, and biodiversity loss** (World Bank Group, 2021). While some crops may benefit from increases in temperature and precipitation, the RCP 4.5 and 8.5 scenarios will have on average a negative impact on the yield of many staple crops in Rwanda (Austin et al., 2020)<sup>16</sup>. Precipitation may also impact power generation in Rwanda, given that **50 percent of Rwandan energy is generated from hydropower**<sup>17</sup>.

While the impacts of climate change are likely to cause difficulties for Rwandan farmers, and given the significance of the agricultural sector, these impacts will surely be felt at the national level, climate change are expected to disproportionately affect women farmers and rural women due to structural gender inequalities and discriminatory social institutions<sup>18</sup>. For a more detailed discussion on the **gendered aspects of climate change** please see section 9.2.4 **Error! Reference source not found.**.

While the impacts of climate change are difficult to predict, particularly for the economy at large given the dynamic nature of the modern Rwandan economy, the impacts that have already been seen and are most likely to continue are outlined below in sections 3.1.2 and 3.1.3. These impacts are primarily felt at the production level for the value chains considered in this study (with the exception of landslide and flood risk which can impact transport). We first present available evidence on climate risk and then discuss the tangible and available mitigation measures that can be implemented to combat these.

### 3.1.2. Environmental hazard at district level

This chapter describes the three major environmental hazards associated with climate change at the district level and presents a series of recommended mitigation and

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<sup>16</sup> This analysis examined the yield of 11 crops (Sorghum, Maize, Climbing bean, Bushbean, Soybean, Irish potato, Sweet potato, Cassava, Dessert Banana, Beer banana, and cooking banana) under the RCP4.5 and RCP 8.5 CMIP5 scenarios. For some crops the short term impacts appear to be increased yields, however in the long term the impacts are negative for all crops.

<sup>17</sup> <https://www.theigc.org/blogs/climate-priorities-developing-countries/building-resilience-rwanda-tackling-climate-change>

<sup>18</sup> <https://www.oecd-ilibrary.org/sites/0975e138-en/index.html?itemId=%2Fcontent%2Fcomponent%2F0975e138-en>

adaptation measures. For this purpose, drought, landslide and erosion, and flood risk are illustrated at the level of every district in Rwanda.

### 3.1.2.1. Water scarcity and drought risk

Rwanda has so far been spared severe water scarcity problems due to its high rainfall. However, a backdrop of declining water levels in lakes and waterways has been registered across the country. The confluence of rapid population growth, urbanization, environmental degradation, and pollution, coupled with anticipated shifts in precipitation patterns, presents the nation with a new set of challenges. To successfully meet these challenges, there is an urgent need to focus more intensively on water management strategies, explore options for increased water storage, strengthen irrigation infrastructure, and enhance water monitoring systems (World Bank Group, 2021). This proactive approach is essential to meet the increasing water demand expected in all regions of the country. Climate change poses an escalating threat. Rising temperatures and prolonged dry spells will reduce surface flows, increasing the risk of water scarcity, particularly in the eastern regions and around Kigali. In addition, these climate-related changes may impede the recharge of groundwater resources (World Bank Group, 2021).

Kayonza, Kirehe, Ngoma, and Rwamagana - together with the other districts of the eastern province - are particularly prone to water scarcity hazard and already experience moderate to very high susceptibility to severe droughts. The exposure to high drought risk is particularly high during the March – May rainy season when rains are needed for production, as well as between September and December with a total of about 157,700 and 62,000 tons respectively of major crops being vulnerable to severe droughts (World Bank Group, 2022).

Kayonza district is the most exposed to high probability of being affected by severe droughts, where 75 percent and 25 percent of its total area are respectively in high and very high drought susceptibility classes. Other districts that have high susceptibility to severe drought are Kirehe, Gatsibo, Kicukiro, Nyagatare, Nyarugenge, and Rwamagana where more than 40 percent of their total area are in high or very high drought susceptibility classes (Table 6) (MIDIMAR, 2015).

**Table 6: Water scarcity and drought risk at district level**

District	Water scarcity/ Drought risk
Rulindo	Low risk
Gakenke	Very low risk

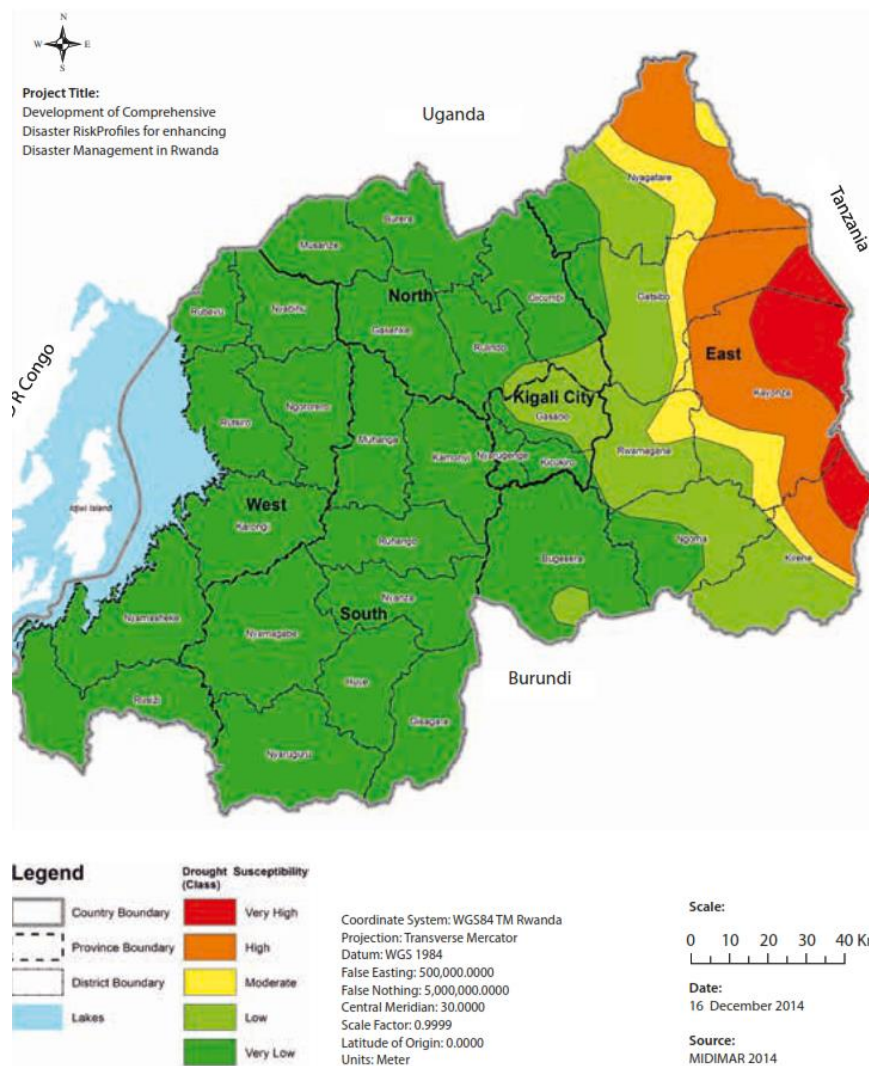
<b>District</b>	<b>Water scarcity/ Drought risk</b>
Kayanza	Very high risk
Rwamagana	High risk
Ngoma	Medium risk
Kirehe	Very high risk
Nyamagabe	Very low risk
Huye	Low risk
Nyabihu	Very low risk
Rubavu	Very low risk

Source: MIDIMAR (2015)

Rwanda has three distinct agricultural seasons: Season A (September to February), Season B (March to June), and Season C (July to September). Season C, which is the shortest, is devoted to the cultivation of vegetables and sweet potatoes, mainly in the swamps, while Irish potatoes are grown in the volcanic agroecological zones. The following considerations are limited to the two main seasons, A and B.

For both Season B (Figure 4) and Season A (Figure 5), there is a high correlation between rain distribution and crop performance.





**Figure 5: Drought hazard map of Rwanda (Season A: September to February)**

Source: MIDIMAR (2015)

Rwanda has introduced integrated management of water resources at the district and community levels, defined catchment wide responsibilities, clustered catchment partner-districts according to sub-catchment regions, and is working to improve understanding of water users within districts and catchments. Rwanda is also developing a National Water Security Plan to improve water harvesting and storage techniques and improve irrigation efficiencies (World Bank Group, 2021).

## Recommendations

Rwanda has three distinct agricultural seasons (Season A: September to February and Season B: March to July and Season C, July to September), with Season B and C having

lower crop yields, farmers should consider growing crops that require less water. Particular attention should be paid to the Eastern Province, which receives comparatively less rainfall than other regions of the country. Implementing specific mitigation measures such as irrigation and water retention can help to address this challenge (MIDIMAR, 2015).

Measures to mitigate water scarcity hazard should include the following:

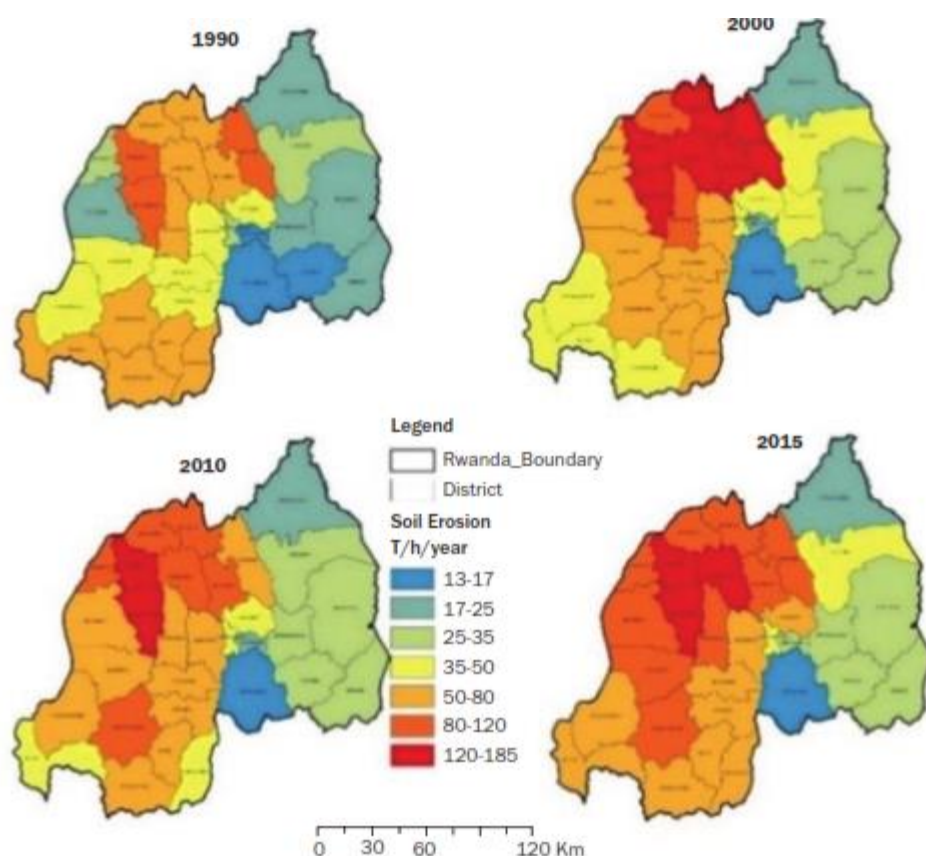
- conducting specific analysis based on local datasets to assess the risk of drought and water scarcity information.
- Establishing and enhancing policies and strategies for Integrated Water Resource Management (IWRM)
- Setting up an information system for early warning of hydrological and agro-meteorological systems and rapid intervention mechanisms
- Promotion of non-agricultural income generating activities
- Introduction of species resistant to extreme weather conditions
- Development of alternative sources of energy to firewood

### 3.1.2.2. Landslide and erosion risk

**Landslides are a frequent hazard phenomenon in Rwanda.** This is related to the rainfall patterns, terrain slope, geology, soil, land cover and (potentially) earthquakes. Landslide risk is calculated on the basis of different factors, including the lithology, soil type and depth, slope, rainfall, land cover, and distance to roads (MIDIMAR, 2015).

**Landslides are likely to increase due to climate change.** Changes in precipitation and temperature can affect the slope and bedrock stability, making the region even more prone to landslides. To ensure accurate forecasting and thorough risk assessment, it is essential to conduct a site-specific analysis. The most impacted is the western province with more than half of the total deaths recorded, followed by the northern province (38 percent) of the total cases. Districts Nyabihu, Rulindo, Burera and Karongi experienced more deaths than others (MIDIMAR, 2015).





**Figure 6: Soil erosion in Rwanda**

Source: World Bank (2022), based on National Institute of Statistics of Rwanda (2019)

Figure 6 illustrates the erosion susceptibility map of Rwanda. Rulindo, Gakenke, Karongi, Nyabihu, Nyamagabe, and Rubavu present high to very high susceptibility (see Table 7). Nyabihu has the highest percentage (58 percent) of area exposed to high and very high slope susceptibility and accounts for the highest number of people killed by landslide and the highest number of houses destroyed or damaged by landslide.

**Table 7: Soil erosion in Rwanda**

District	Soil erosion risk
Rulindo	High risk
Gakenke	Very high risk
Kayonza	Low risk
Rwamagana	Low risk
Ngoma	Low risk
Kirehe	Low risk



District	Soil erosion risk
Nyamagabe	High risk
Huye	Moderate - high risk
Nyabihu	Very high risk
Rubavu	High risk

Source: World Bank (2022), based on National Institute of Statistics of Rwanda (2019)

## Recommendations

Landslide hazard estimates depend on several factors. This makes accurate hazard estimates at small scales difficult. It is therefore recommended to perform a site-specific assessment and to rely on local data sets for accurate results.

Bench terracing has proved to be effective against landslides and general soil erosion control. A study from Bizoza and Graaff (2010) highlights its potential from a financial perspective and is further discussed in chapter 3.1.3.1.

Like flood prevention, landslide control benefits from appropriate land cover to prevent soil loss and erosion. This can also be achieved by integrating trees into the landscape in locally adapted agroforestry systems.

### 3.1.2.3. Flood risk

**Of the three main risks outlined in section 3.1.2, the agricultural sector is the most vulnerable to flooding.** A monitoring system of flood hazard events and their consequences was implemented in Rwanda between 2011 and 2013. During this period, 746 hectares of land were affected by floods (MIDIMAR, 2015)

**Table 8. Climate risks and existing production in ten districts in Rwanda**

District	Flood
Rulindo	Very high
Gakenke	Very high
Kayanza	No data
Rwamagana	Very high
Ngoma	High
Kirehe	No data
Nyamagabe	No data

District	Flood
Huye	No data
Nyabihu	High
Rubavu	Very high

Source: MIDIMAR (2015)

According to the National Risk Atlas of Rwanda (2015), some districts including Rulindo, Gakenke, Rwamagana, Ngoma, Nyabihu, and Rubavu are more vulnerable to flooding than others.

## Recommendations

- Flood risk depends on several factors. This makes accurate hazard estimates at small scales difficult. It is therefore recommended to perform a site-specific assessment and to rely on local data sets for accurate results.
- Crop planning in districts that are exposed to high risk should be supported by a site-specific analysis of flood risks.
- Flood loss can be contained by adopting several best practices at the watershed level. Introducing crop rotation, grassed waterways, and detention ponds can significantly reduce the frequency and the damage from flooding events (Antolini et al., 2020).
- Like landslide prevention, flood control benefits from terracing and appropriate land cover to prevent soil loss and erosion. This can also be achieved by integrating trees into the landscape in locally adapted agroforestry systems (Antolini et al., 2020).
- Buffer zone construction can mitigate flood damage. Interviews conducted with tomato producers in the Kirehe district revealed that 50 m buffer zones from the river beds have not been sufficient to avoid crop destruction during a major flood event<sup>19</sup>.

### 3.1.3. Mitigation measures and associated costs

To effectively manage and mitigate the environmental and climate risks highlighted in the previous chapter, it is critical for Rwanda to adopt a number of mitigation measures.

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<sup>19</sup> Kir\_4

This chapter outlines the key strategies, some of which are already being actively applied and are ready to be scaled up, while others are still in the early stages of implementation.

**Farmers implement a range of mitigation measures in agricultural fields, particularly on steep terrains, to manage soil and water loss.** These measures typically include a combination of terracing and irrigation to build resilience during dry periods. Terracing, a key practice, can be implemented at different levels of sophistication and cost, including progressive, bench terracing, and agroforestry systems. Other soil conservation and fertilization practices include mulching and composting, with methods such as bokashi serving as effective approaches. Further measures to mitigate climate risks, as detailed here, extend to reducing post-harvest losses, which account for a significant proportion of heat-related losses in the value chain. In addition, there is a focus on pest and disease management, which includes a variety of approaches to control insect, fungal, bacterial and virus-borne diseases that are both observed and expected to increase with climate change.

### **3.1.3.1. Erosion control with terracing**

Terraces and filter ditches are critical soil and water conservation strategies for watershed restoration and protection. In agriculture, a terrace is a leveled segment on a cultivated slope that is strategically used as a soil conservation tool to reduce or stop rapid surface runoff of stormwater.

Different types of terraces are suitable for different areas and slopes, including radical and progressive terraces. Progressive terraces are formed by creating contour bunds using a combination of soil or stone, along with ditches and vegetation. These are a more passive and gradual option and are often preferred for their effectiveness (Rwanda Water Portal, 2023).

Bench or radical terraces are built on terrains with steeper slopes, a construction process that requires significant labor and financial investment. The design of these terraces carefully considers the composition of the soil and subsoil. In cases where a thin arable layer rests on a rocky surface, terrace construction becomes infeasible. Radical terracing, while effective, may experience an initial reduction in production due to the removal of the top layer containing organic material and soil microorganisms. The underlying layers are typically hard and less fertile. To mitigate this drop in production, the top layer is temporarily stored and later reintegrated, although full recovery may take three seasons. To speed up the process, it is advisable to supplement additional manure and organic matter. Effective protection of the steep end of the terrace or riser requires the

strategic use of groundcover vegetation. The choice of vegetation should be based on its role in the overall production system. For example, it could be a crop with inherent pest control qualities, such as a push and pull system, or it could serve additional purposes, such as providing fodder or mulch, while avoiding competition with the main crop. Grasses such as vetiver and napier grass are commonly used for erosion control. Napier grass, when cut, serves as nutritious fodder for cows. The subsequent cow manure is then returned to the land, replenishing nutrients that were depleted during the harvest (Rwanda Water Portal, 2023).

A study from Bizoza and Graaff (2010) highlights the potential of radical terracing from a financial perspective. When using “plot-level Cost Benefit Analysis”, which used both farmers' estimates and official standard figures, showed that bench terracing is a financially sound choice in this scenario. This implies that bench terracing can be a viable and profitable option for soil and water conservation if labor and manure costs can be reduced, or if the terraces are used more intensively, leading to higher yields.

The costs of bench terracing vary between 366,508 to 800,000 Rwf per hectare, using respectively farmers and standard estimates (Bizoza & De Graaff, 2010). This was confirmed by the field data collected from the various interviews, as illustrated in Table 9.

**Table 9: Cost estimates of erosion management measures from field surveys**

Measure	Estimate	Region	Source
Contour lines	The cost to build depends on the nature and type of control measure: For example, the cost of making lines is Rwf 300,000 per hectare	Gakenke	Producer Group Gakenke field survey 07.11.23 (Gak_8)
Terracing	To build terraces cost 500,000RwF per hectare	Gakenke	Green bean producer, 26.11.23 (Gak_9), (Gak_10)
Terracing	Terracing including manure and seedlings for 2 seasons – 2,500 EUR – (3,365,000 RWF)	Rutsiro (relevant for Rubavu and Nyabihu)	Albertine Rift Conservation Society in Rwanda (ARCOS)
Terraces planted with agroforestry	The cost varies between 1,500,000-2,500,000Rwf/ha	Huye	Chili producer (Huy_3)
Bench terraces	These terraces are more expensive and technical than the “progressive”	Huye	Green bean producer (Huy_4)

Measure	Estimate	Region	Source
	ones and cost at least 1,000,000Rwf/ha		
Progressive terraces	Establishment is estimated at 100,000 Rwf/ha	Kayanza	Tomato producers (Focus group discussion) (Kay_1), (Kay_3)
Progressive and bench terraces	The cost for radical terraces is estimated to 1,500,000 Rwf /ha whereas that of progressive ones is estimated at 500,000Rwf/ha	Kirehe	Passion fruit producers (Focus group discussion) 17.11.2023 (Kir_3)
Terracing	7 Fosse cost 1,500 Rwf, the cost may vary depending on the size of land	Rulindo	Chili farmers FGD 10.11.2023 (Rul_12)

Source: As indicated

### 3.1.3.2. Soil stabilization and fertilization

Soil stabilization and fertilization through legumes (e.g., French beans) intercropping and agroforestry systems have proven to be effective methods to increase soil quality while preventing erosion and soil loss (USAID, 2018a). Mulching is a common practice among farmers in Rwanda and is done for soil and water conservation as well as for mitigating greenhouse gases' emission<sup>20</sup>.

#### Bokashi as an alternative to synthetic fertilizer

Bokashi is a type of composting that involves fermenting organic matter, including kitchen scraps, into a nutrient-dense plant food. It is a cost-effective and efficient way to eliminate environmental waste (Green, 2019). Bokashi can offer several benefits for smallholder farmers:

- Bokashi adds nutrients and microorganisms to the soil, which improves soil structure and fertility<sup>21</sup> and it is also cost-effective : Farmers can make bokashi fertilizer themselves using farmyard manure, charcoal dust, and maize bran
- Bokashi has been shown to reduce pest pressure, allowing farmers to reduce their dependence on pesticides and fungicides

<sup>20</sup> Huy\_3

<sup>21</sup> <https://news.mongabay.com/2021/11/bokashi-fast-decomposing-bio-fertilizer-proves-effective-for-organic-farmers-in-kenya/>

- Bokashi allows smallholder farmers to recycle food waste, which would otherwise end up in landfills<sup>22</sup>
- Farmers can produce their own bokashi, which reduces costs and provides them with a continual source of fertilizer, and it is relatively easy to produce
- Overall, bokashi is an effective way for smallholder farmers to improve soil health, reduce waste, and reduce their dependence on chemical fertilizers and pesticides.

A basic breakdown of the costs to produce bokashi is provided in Table 10. At the time of writing there were no businesses in Rwanda specializing in supplying bokashi locally, however there is a similar initiative underway using insect farming to produce biofertilizer<sup>23</sup>, and some companies such as IKIREZI that aim to produce organic products have developed their own biofertilizer and biopesticide solutions<sup>24</sup>. Pride Farms is another larger business that produces according to regenerative agriculture principles<sup>25</sup>.

**Table 10: Costs to produce 2 tons Bokashi.**

Item	Quantity	Price Rwf
Brown sugar	2 kg	2,233
Yeast	1 kg	3,526
maize bran	1 bag	5,876
Sunflower cake	50 kg	7,345
Material crushing (Char-coal and Sunflower cake)	Labour cost	2,938
Packaging bags	Bags	11,752
Material collection and transportation	Labour cost	8,814
Other labour	Labour cost	14,690
Total		57,173
Yield:	2 tons	
Price per bag to produce	50 kg bag	1,429

Source: Zambia Promotion of Agroforestry project for BMEL and Ministry of Agriculture Zambia

<sup>22</sup> <https://www.echocommunity.org/en/resources/ad346124-3f22-4ae0-8c61-9bc757cc5bb7>

<sup>23</sup> <https://sucafina.com/na/news/making-biofertilizer-in-rwanda>

<sup>24</sup> <https://www.ikirezi.com/productsoverview>

<sup>25</sup> <https://www.pridefarms.rw/about-us>

### 3.1.3.3. Irrigation

Irrigation is emerging as a viable strategy to reduce the vulnerability of horticultural production to the increasing unpredictability of rainfall. There are many different levels of irrigation infrastructure with varying costs and effectiveness associated with them. The adoption of drip irrigation, powered by solar pumps, is emerging as an economically viable solution that represents a significant step forward in adapting to the challenges of climate change (unique land use, 2021). A comprehensive analysis of irrigation potential and methods in Rwanda was carried out by the World Bank/IFC in 2021 (Nzeyimana, 2021).

In the field, the most commonly observed irrigation infrastructure is uncovered dam-sheet irrigation. Irrigation projects have historically faced some difficulties as outlined in Box 1.

#### **Box 1: Irrigation in Rwanda**

In Rwanda, many surface or flood irrigation systems are typically not very effective due to several factors such as damage, insufficient upkeep, and poor management of the infrastructure. Additionally, problems arise from taking too much water, inadequate water supply, failure to follow the irrigation schedule, water theft (farmers taking water from a catchment illegally), and water pollution. As a result, conflicts have emerged between households in catchment areas and irrigation schemes. In 2015, around 7 percent of areas using FLID (Farmers-Led Irrigation Development) experienced conflicts related to water between those upstream who use the water and either irrigation water users' associations (IWUAs) or producer cooperatives.

Farmer-led irrigation development (FLID) marshlands are areas of land owned by the government, which are leased to smallholder farmers or cooperatives for periods of either 49 or 99 years. In hillside FLID schemes, the irrigation infrastructure is developed on private land with partial support from the government, and established IWUAs collect fees from smallholder users of irrigation water. These fees ensure that there are funds available for maintenance, management, and operation of the irrigation infrastructure. The IWUAs deduct water fees from crop sales made to cooperatives after every harvest, and the money is deposited into nearby microfinance institution bank accounts that the established IWUAs manage.

Source: Nzeyimana (2021)

Costs for a water distribution system are highly variable as shown in Table 11 and the costs for the different elements of a water harvesting system are shown in Table 12.

**Table 11: Investment Costs for an SSI Drag Hose System**

	Estimated coverage (hectares)	Equipment	Price (RF)	Total Price (RF)
Drag hose system	1 hectare	Water pump and fittings Hose	250,000 100,000	<b>300,000</b>
Rain gun system connected to flexible pipes	5 hectares	Water pump and fittings Flexible pipe fittings with rain guns Rain guns Rain gun stands with accessories	1,600,000 600,000 240,000 320,000	<b>2,760,000</b>

Source: Nzeyimana (2021)

As can be seen from the tables there is a great variety in cost depending on the desired equipment and capital set up.

**Table 12: Investment Costs for FLID Water Harvesting Facilities with a Covered Dam Sheet Reservoir**

Item	Total Price (RF)
Dam sheet (250 cubic meters)	800,000
Excavation (250 cubic meters)	300,000
Construction of waterways and sedimentation chamber (10 cubic meters)	150,000
Roofing with iron sheets, supported by metallic tubes	4,500,000
Fencing and grass protection	200,000
Total	5,950,000

Source: Nzeyimana (2021), RAB (2018)

Estimates of the operating and capital costs of irrigation from field surveys are presented in Table 13.



**Table 13: Cost estimates of irrigation from the field surveys**

Measure	Estimate	Region	Source
Irrigation with watering cane and generator	Irrigating 1 hectare can cost 72,000RWF per season	Gakenke	Green bean producer, 26.11.23 (Gak_9)
Irrigation	The farmer needs 5 million for acquiring irrigation equipment for one ha of land	Kirehe	Chili producer group in Kirehe 17.11.23 (Kir_2)
Irrigation material	The estimate of establishing irrigation material is 500,000 Rwf	Rulindo	Farmer groups (Cabbage and Green beans) 16.11.2023 (Rul_4) Farmer group Chilli 8.11.23, (Rul_10)
Water tank	One water tank costs 600 000 Rwf	Rulindo	Youth group FGD, tomato VCs 16.11.2023 (Rul_6)
General irrigation costs	Watering/irrigation cost 8000Frw/Acre from plantation up to harvesting.	Rubavu	Cabbage producer 22.11.2023 (Rub_3)
Ditches	The cost of ditches range between 400,000 and 500,000F.	Ngoma	Tomato producer 04.11.2023 (Ngo_4)
Holes (ibidumburi) dug near farms for irrigation purposes	4,000 Rwf per hole	Rubavu	Tomato farmer group 28.11.2023 (Rub_9)

Source: As indicated

**It appears from survey responses, that the SSIT subsidy is being under utilized by farmers in the target districts.** The Small-Scale Irrigation Technology (SSIT) subsidy is part of the Rwanda Irrigation Master Plan, dating from 2010 and recently updated in 2020. The subsidy provides a 50 percent discount on irrigation equipment to smallholder farmers through designated service providers. The extent of irrigation facilities, and the utilization of the SSIT subsidy is not precisely known. In 2018, a study by the Rwanda Agriculture and Animal Resources Board (RAB) found that only 5,000 of 84,704 hectares of potential irrigable land had been developed<sup>26</sup>. Similarly, Nzeyimana (2021) estimated that there

<sup>26</sup> RWANDA AGRICULTURE AND ANIMAL RESOURCES BOARD, “Feasibility Study for the Identification of Potential Small Scale Irrigation Areas In Rwanda (Final Report)” , Sept 2018

were 6,874 hectares of land irrigated in 2018, mainly in the Eastern and Southern provinces (Nzeyimana, 2021). Evidence from the field survey suggests that irrigation technology is seen mainly as an opportunity for future production, and that the current level of irrigation facilities is very low.<sup>27</sup> Irrigation is reported by many farmers as being a male dominated activity because it requires heavy lifting (referring to traditional irrigation).<sup>28</sup> A very small number of farmers reported that they had received a subsidy for irrigation, however this was done through the SAIP program<sup>29</sup>. **Given the very low levels of experience with mechanized irrigation, it is not possible to make general statements regarding the preferred irrigation technologies for farmers.** The cost of irrigation facilities outlined in Table 11 and Table 12 are well beyond the financial means of typical smallholder farmers. Farmers prefer to rent or borrow SSIT equipment from other farmers or cooperatives (Nzeyimana, 2021). The subsidy is also designed to encourage land consolidation, and as such plots of 7-10 hectares received a higher subsidy than smaller areas, thus requiring cooperative structures for most farming groups (Nzeyimana, 2021). Farmers must also farm a high value crop such as banana, or vegetables such as onions and tomatoes. Most Rwandan smallholder farmers prefer the following: (a) a drag hose system, (b) rain guns with flexible pipes, (c) rain guns with high-density polyethylene (HDPE) pipes, (d) a semi-permanent sprinkler system, or € a solar-powered irrigation system. Detailed financial analysis of these systems can be found in Nzeyimana 2021.

**It should be noted that development projects where grant financing is provided for irrigation are often unclear about who has the responsibility for maintenance in the long term.** This leaves farmers in a difficult position due to the lack of maintenance services and the lifespan of donor funded equipment. Often farmers are unwilling and unable to cover these costs beyond the scope of the project lifespan (Nzeyimana, 2021).

#### 3.1.3.4. Reduced post-harvest loss with cold chain infrastructure

Rising temperatures expected in the future pose a threat to horticultural value chains, including at the post-harvest stage. If the industry is ever to truly commercialize, horticulture requires a cold chain such system to ensure freshness particularly for export and local high end markets. To meet this challenge, production losses must be minimized by improving harvesting practices and implementing improved post-harvest handling and storage techniques. This includes the integration of advanced cooling and refrigeration systems, which are particularly important for the preservation of perishable horticultural crops such as tomatoes and French beans (USAID, 2018a).

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<sup>27</sup> Kir\_20, Kay\_3, Kir\_4, Huy\_4, Ngo\_7

<sup>28</sup> Ib id.

<sup>29</sup> Ngo\_8

There are climate smart investment opportunities in cold chain infrastructure to leverage investments in high-value horticultural products. Rwanda has witnessed significant growth in horticultural exports over the past five years, and growth is projected to remain high for the coming years. NAEB packhouse facilities and cold trucks which helped kick-start horticultural exports are operating at maximum capacity. There is potential for several cold chain logistics companies (encompassing packhouses and cold trucks) to leverage economies of scale and provide a more cost-effective and efficient solution for Rwandan horticultural producers. Some large horticultural producers have considered building their own facilities; however, these require high upfront capital investment, with limited scalability and such investments are not feasible for project participants. . An expansion of cold chain infrastructure is a prerequisite to the climate-smart investments in high-value horticultural commodities described above. The investment reduces food loss and waste (FLW), resulting in a more efficient use of natural resources and less GHG emissions per unit of produce. The investment profile of cold chain logistics companies is summarized in Table 14 (unique land use, 2021; USAID, 2018a). At present, access to cold storages limited to commercial operations for export purposes.

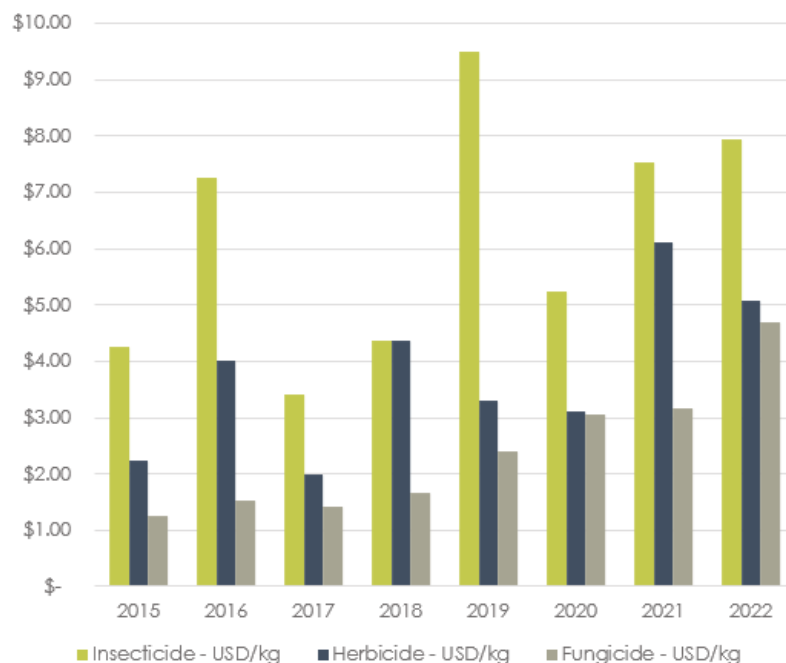
**Table 14: Investment profile Cold chain logistics company**

<b>Investment required</b>	Approximately RWF 1.45 billion Initial investment includes packhouse installation and purchase of cold trucks <b>Operating costs include fuel, packhouse operating costs and asset maintenance</b>
<b>Average volume</b>	31,000 MT/year (The cold chain company would capture 20 percent of export volume of horticultural produce by year 10)
<b>Average sales</b>	Approximately RWF 3.5 billion per year (based on 50 percent increase over current NAEB prices to account for transport from farm to packhouse)
<b>Expected return</b>	15-20 percent over 10 years
<b>Assumptions</b>	(1) Horticultural exports continue to grow at the rate projected by NAEB; (2) storage prices fully cover transport from farm to packhouse; (3) over the course of 10 years, the company scales out its asset base of packhouses and trucks to keep up with increasing export volumes
<b>Delivery mechanism</b>	Partner with established horticulture exporters, such as Proxi-fresh Ltd, Nature Fresh Foods (Global G.A.P. certified), Golden Cat Ltd, and Gashora farm Ltd
<b>Conditionality/ safeguards</b>	None

Source: unique land use (2021), based on USAID (2018a)

### 3.1.3.5. Integrated Pest Management (IPM)

**Overall, pesticides are expensive for farmers and sometimes it is difficult to access pesticides in a timely fashion in some parts of Rwanda.** Aside from the pesticides supplied to coffee farmers by NAEB, pesticides are not subsidized in Rwanda. Figure 7 shows the development of pesticide prices since 2015. The prices represent an average price over the year. Insecticide prices are more volatile than fungicide and herbicide prices. Stakeholder interviews indicate that the high price of pesticides is the main factor in limiting pesticide use. Because of the high prices farmers only purchase the amount of pesticides that they can afford, rather than the amount that they require (Unique land use, 2022).



**Figure 7: Pesticide prices over time**

Source: RRA (2022), Unique Land Use (2022)

**Furthermore, pesticides are often improperly used with the result that crops do not benefit, and the chemicals are potentially hazardous.** Pesticides are applied in improper proportions and at the wrong times, using inappropriate health and safety protocols (Unique land use, 2022).

**Rising temperatures and unpredictable rainfall patterns pose an elevated risk of pest and disease outbreaks in the agricultural sector.** The predominant pest management practices used by the majority of farmers in Rwanda involve a multifaceted strategy that combines cultural practices, the cultivation of resistant varieties, and the selective use of pesticides. In particular, the use of pesticides is mainly limited to crops of high economic value, such as tomatoes, potatoes, rice, and coffee. In contrast, pest management for staple crops such as maize relies mainly on the implementation of cultural practices and the cultivation of resistant varieties.

**The use of pesticides on horticultural crops, including those considered in this study, shows variability according to disease risk as well as cost factors.** The current scenario of pesticide use in tomato production is primarily focused on meeting the challenges posed by late blight (*Phytophthora infestans*), which is a major problem, especially during the rainy season. Pesticides, especially fungicides such as Mancozeb/Dithane M45 or Ridomil/Metalaxyl, are used to control the spread of this disease. Late blight is proving to be a major constraint and its effective management is critical to ensuring a successful

tomato crop (Republic of Rwanda, 2018). One estimate from the field put the cost of pest and disease control for tomato at 250,000 RwF per hectare. In contrast, the use of pesticides in the cultivation of French/green beans and climbing beans is significantly low under field conditions. Despite the potential efficacy of systemic fungicides such as benomyl, their use is limited by the high cost of control and the relatively low market value of beans (Republic of Rwanda, 2018).

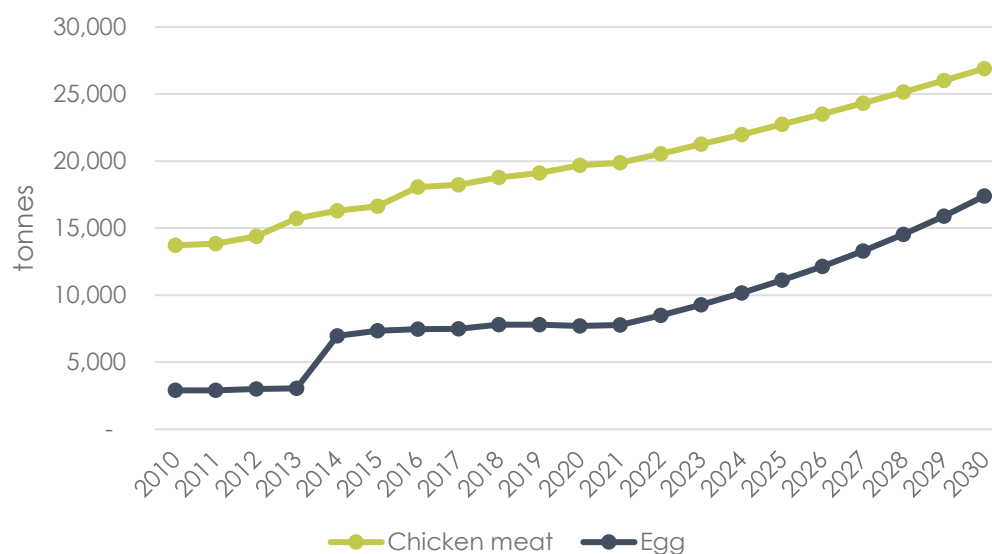
# Thematic Report 1: Market systems

## 4. Market systems analysis: Poultry

### 4.1. Market Mapping

**The poultry sector in Rwanda has significantly expanded in the past decade to meet the national and export demands.** From 2010 to 2021, chicken meat production increased by 45 percent, and egg production increased by 168 percent.<sup>30</sup> The trend of increase in production of chicken meat and egg is projected till 2030 to meet the demand (Figure 8).

**Household consumption is likely to be the main driver of growth in poultry demand in line with increase in production projected till 2030 (Figure 8).** Chicken meat consumption increased from 0.3 kg per capita in 2017 to 0.4 kg per capita in 2022, while eggs consumption did not change (NISR, 2023). The national demand for chicken meat and eggs is concentrated in Musanze, Kigali, and Rubavu (Muhammad et al., 2023)



**Figure 8 Chicken meat and egg production in Rwanda based on FAOSTAT (2010 - 2021) and projection (2022 - 2030)**

**Poultry production is found across all five provinces in Rwanda** and 36 percent of the poultry population was recorded in the Eastern Province (NISR, 2021). However, there is still lack of data that show poultry production at district level. Local chicken account for 58 percent of the total poultry population (Table 15). Approximately 40 percent of chicken reared by farmers are layers for egg production.

<sup>30</sup> FAOSTAT <https://www.fao.org/faostat/en/>

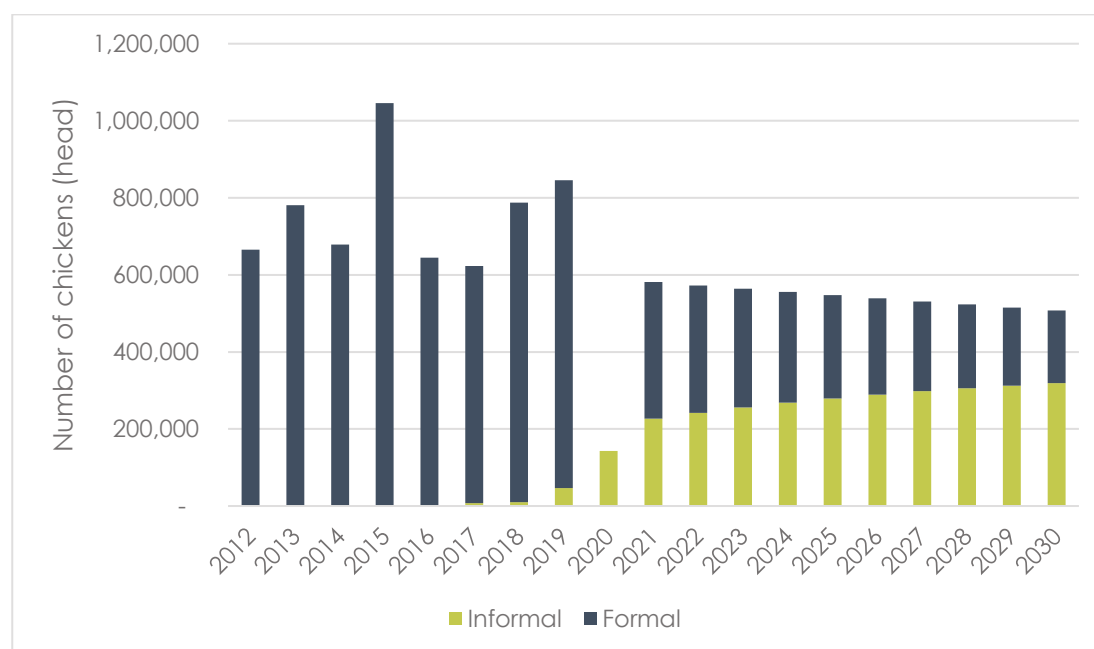


**Table 15: Number of chickens raised by province in Rwanda**

Type of chicken	Provinces					Total
	Kigali	Southern	Western	Northern	Eastern	
Broiler	25,344	35,113	33,586	48,407	97,577	240,028
Layers	150,265	173,731	130,013	187,986	279,143	921,138
Dual-purpose	43,269	148,321	89,633	49,302	178,334	508,858
Local	104,672	584,922	392,058	336,613	866,547	2,284,812

Source: NISR (2021)

**In 2022, the poultry sector contributed 9 percent of total revenue from live animal exports.** However, the revenue from live chicken exports declined by 28 percent between 2017 and 2022 (Figure 9) (NISR, 2022). Within the live poultry exports, 61 percent of total revenue was generated by informal channel (NISR, 2022). Eggs exports also declined from 4.7 million USD in 2018 to 2.8 million USD in 2022 (NAEB, 2022). The neighboring countries such as Burundi and Democratic Republic of Congo are the main export markets (Gill et al., 2021).

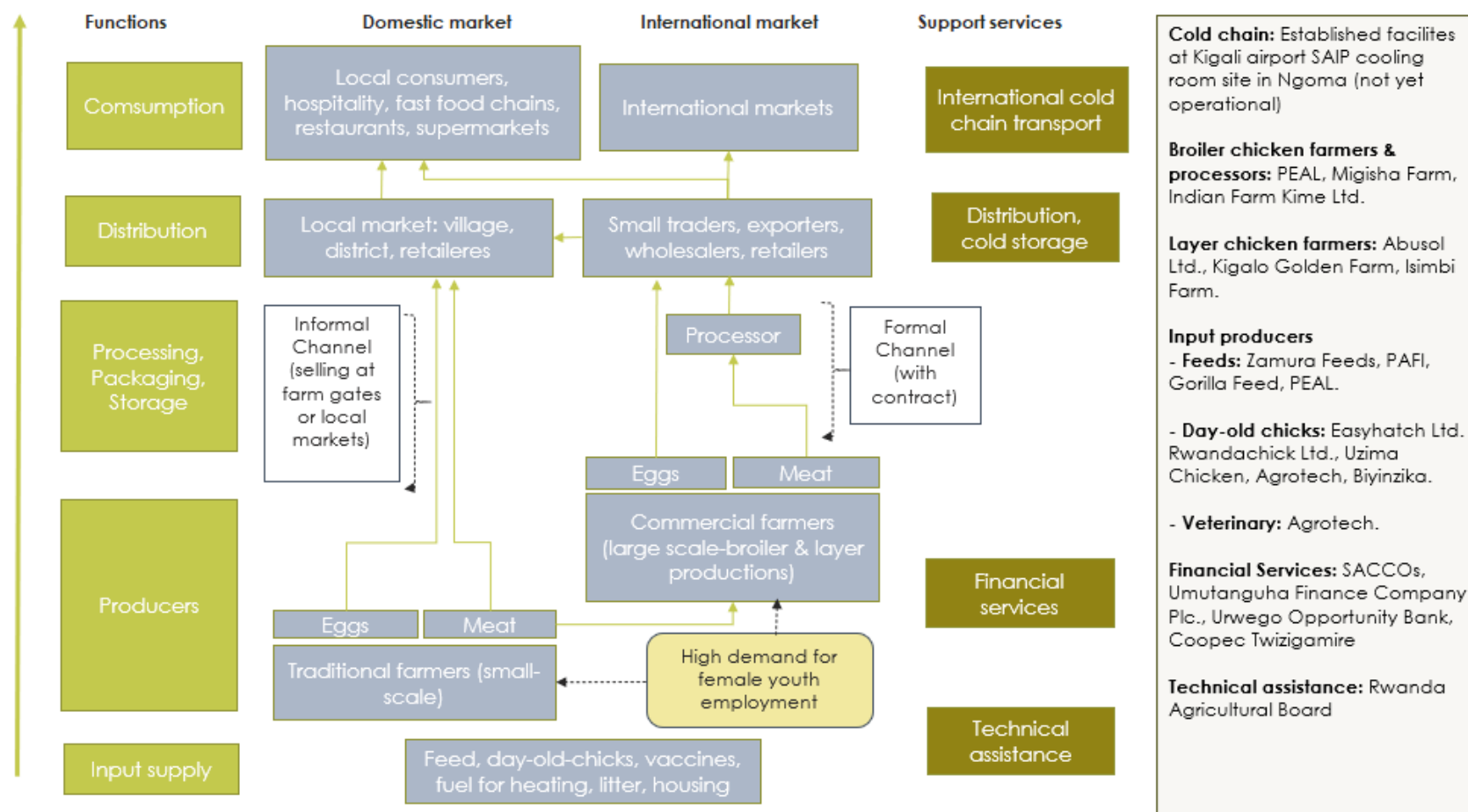


**Figure 9 Poultry export through formal and informal channels in Rwanda based on NISR (2012-2021) and projection (2022-2030)**

**Based on the above analysis, the market potential score for poultry is an 8.**

#### **4.1.1. Poultry Value Chain**

Poultry value chain consists of several nodes based on interview and literature review: input productions, poultry production on farms, processing including packaging and storage, and distribution and consumption. There are two main poultry production systems in Rwanda: the traditional and commercial systems that produce chicken meat and eggs (Cocchini & ter Steeg, 2019). Both systems have distinct approaches to process and distribute chicken meat and eggs (Figure 10). Actors in different value chain nodes are included in Figure 10. In poultry production, a company can play a role in different nodes, for example input production, farming, and processing.



**Figure 10 Poultry value chain schematic**

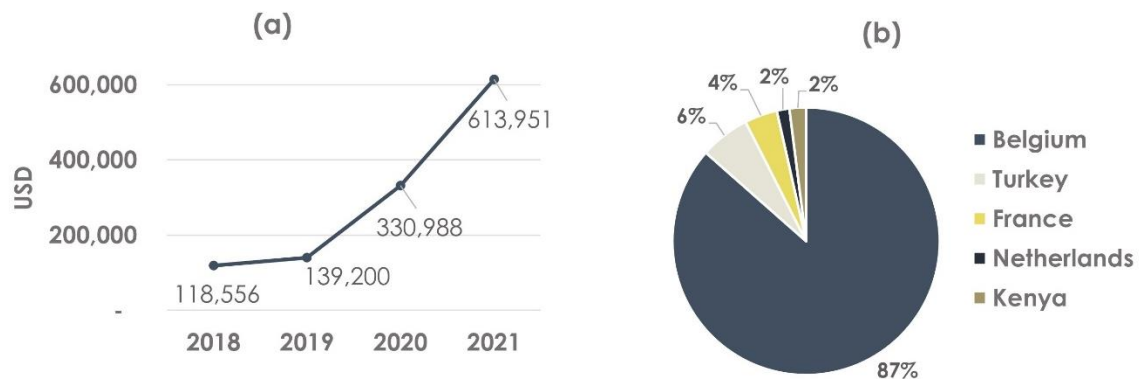
Source: Field interviews and (Gill et al., 2021)

## 4.1.2. Value Chain Nodes

### 4.1.2.1. Input Supply

#### Explanation

Inputs for poultry production are day-old chicks (DOCs), feeds, vaccine and medicines, fuel for heating, materials or litter and housing. DOCs were mainly imported from Belgium until the Government of Rwanda encouraged the private sector to invest in hatcheries (Cocchini & ter Steeg, 2019); (Gill et al., 2021). However, import of DOCs still increased by five folds between 2018 and 2021 (Figure 11.a) (OEC, 2023). DOCs are also imported from the Turkey, France, the Netherlands, and Kenya (Figure 11.b) (OEC, 2023). The main importers of DOCs were Agrotech Ltd and Biyinzika that imported 240,000 layers and 192,000 broilers (Cocchini & ter Steeg, 2019). These companies also sell medicines and feeds. Regarding feed, the ingredients for poultry feeds such as cereal grains, vegetable and animal proteins, and mineral supplement, are usually imported by the feed mills.



**Figure 11 Import value of day-old chicks (a) and exporters of day-old chicks to Rwanda in 2021 (b)**

#### Fit for youth/female employment

Based on the interview and literature study, we observed **a low employment opportunity for women and female youth because of a small number of industries producing inputs for poultry farm** (feeds and medicines). Nevertheless, employment opportunity is potential on farms producing DOCs. The focus group discussion revealed that women and youth are mostly involved in on-farm activities such as rearing and feeding (see production node in the following section).

### Skill gaps

Production of DOCs, feeds, vaccines and medicines require high-skill labor. These Input productions must comply with regulations and standards to ensure quality, safety, and animal welfare. Hence, only female and female youth with high-education degree or appropriate certification can access employment opportunity in this node.

## 4.1.2.2. Production

### Explanation

The category of poultry production in Rwanda falls into traditional and commercial systems. The traditional system is characterized as small-scale that rears 8 birds per household (Mbuza, Habimana, et al., 2016; Mazimpaka et al., 2017). This production system rears local chickens that produce egg and meat using minimal inputs because the birds can scavenge feed. In poultry traditional systems, the mature age of birds is 7 months for hens and 6 months for cockerels (Mbuza, Habimana, et al., 2016). Farmers keep birds for years to replace their stock. Most of the poultry production in Rwanda falls into the traditional category (Shapiro et al., 2017); (Cocchini & ter Steeg, 2019). The commercial poultry system has large-scale broiler and layer productions, rearing 500 birds on average per farm (Mbuza et al., 2017). Few companies in Rwanda run a very large-scale of broiler and layer production, rearing between 5,000 and 50,000 birds (Cocchini & ter Steeg, 2019). This production system is input intensive, relying on imported feeds and day-old-chicks (DOCs).

Broiler production in Rwanda is categorized as a commercial system. Layer production in Rwanda mostly used deep-litter system (91 percent) and only a few used battery cage (Mbuza, Majyambere, et al., 2016). Similar to broiler production, layer production needs to import DOCs, feeds, and medicines. Most farmers raised ISA Brown layer and Rhode Island Red laying hens (focus group discussion, (Mbuza, Majyambere, et al., 2016).

To understand opportunities and challenges in poultry production, interviews and focus group discussions were conducted in the Gakenke, Kirehe, Rubavu, Rulindo, and Rwamagana districts. The poultry farmers in five districts mentioned that poultry rearing is a profitable business to meet a high demand for chicken meat, eggs, and manure in Rwanda (Table 15). The respondents were poultry farmers, the chairman of Rwanda Poultry Association, the district staff in Rubavu and Rulindo. The poultry farmers in Gakenke, Kirehe, Rubavu, Rulindo, and Rwamagana districts identified opportunities and challenges for poultry production **Error! Reference source not found.**

**Table 16: Opportunities and challenges identified by the poultry farmers in five districts in Rwanda**

District	Opportunities	Challenges
Gakenke	<ul style="list-style-type: none"> <li>▸ Profitable business</li> <li>▸ Selling manure for additional revenue</li> <li>▸ Require of small land size.</li> </ul>	<ul style="list-style-type: none"> <li>▸ Lack of investment</li> <li>▸ Uncertain prices and availability of inputs (i.e. chicks, feed, and vaccines).</li> <li>▸ Technical knowledge barrier regarding feeding and animal health.</li> <li>▸ Limited information about the market.</li> <li>▸ High transportation cost.</li> </ul>
Kirehe	<ul style="list-style-type: none"> <li>▸ Selling manure for additional revenue.</li> <li>▸ Direct selling to refugee camp, hotel, restaurant, and catering.</li> <li>▸ Poultry breed diversification to access new market.</li> </ul>	<ul style="list-style-type: none"> <li>▸ Low profit due to chicken mortality.</li> <li>▸ Limited access to loan.</li> <li>▸ Low number of input suppliers.</li> </ul>
Rubavu	<ul style="list-style-type: none"> <li>▸ Daily cash income from selling eggs.</li> <li>▸ Organic certification to access premium market.</li> </ul>	<ul style="list-style-type: none"> <li>▸ Poor feed quality.</li> <li>▸ Technical knowledge barrier regarding animal husbandry, access to finance and land.</li> <li>▸ Competition with imported chicken meat and eggs.</li> </ul>
Rulindo	<ul style="list-style-type: none"> <li>▸ Meeting demands for chicken eggs, meat, and manure.</li> </ul>	<ul style="list-style-type: none"> <li>▸ Uncertain prices and availability of inputs (i.e. chicks, feed, and vaccines).</li> <li>▸ Lack of investment.</li> <li>▸ Technical knowledge barrier regarding animal husbandry and product quality assessment.</li> </ul>
Rwamagana	<ul style="list-style-type: none"> <li>▸ Profitable business, even on a small scale.</li> <li>▸ Poultry breed diversification to access new market.</li> </ul>	<ul style="list-style-type: none"> <li>▸ Uncertain prices and availability of inputs (i.e. chicks, feed, and vaccines).</li> <li>▸ Lack of technology.</li> <li>▸ Limited information about the market.</li> </ul>

Source: focus group discussion and interview

The common challenge faced by the poultry farmers in the five districts was related to inputs. Prices and availability of DOCs, feeds, and vaccines often fluctuate (**Error! Reference source not found.**). Besides, the poultry farmers also pointed out limited technical knowledge regarding animal husbandry, animal health, and the market. These two main challenges for the poultry farmers were confirmed by the Rwanda Poultry Association and official staff in Rubavu and Rulindo. Lack of investment was faced by the farmers in Gakenke, Kirehe, and Rulindo districts. Although most farmers identified poultry rearing as a profitable business, the farmer in Kirehe and Rubavu highlighted mortality and competition with imported products as critical challenges leading to profit loss. Because of high production cost in Rwanda, imported chicken meat and egg potentially have lower prices and preferable than local products.

### Fit for youth/female employment

The interview and focus group discussion highlighted **poultry production as the node with the highest employment opportunity for women and female youth**. Table 16 presents different roles performed by women and female youth in poultry production. On the farm, women and female youth are active in poultry rearing including feeding, cleaning sheds, treating sick chicken as well as selling chicken meat, eggs, and manure. Because of their involvement in on-farm activities, women and female youth are the main decision makers for input procurement and direct selling at the farm gate.

**Table 17: Roles and skill gaps of women and female youth in Rwanda's poultry production**

District	Roles	Skill Gaps
Gakenke	<ul style="list-style-type: none"> <li>Activities on the farm (i.e. feed and water provision for chicken, cleaning animal house, treating sick chicken)</li> </ul>	<ul style="list-style-type: none"> <li>Animal husbandry management</li> <li>Entrepreneurship</li> </ul>
Kirehe	<ul style="list-style-type: none"> <li>Activities on the farm</li> <li>Inputs procurement</li> </ul>	<ul style="list-style-type: none"> <li>Animal disease management</li> <li>Poultry housing management</li> <li>Capacity to access loan</li> </ul>
Rubavu	<ul style="list-style-type: none"> <li>Activities on the farm</li> <li>Bookkeeping</li> <li>Sell products in the markets</li> </ul>	<ul style="list-style-type: none"> <li>Technology adoption to improve productivity</li> <li>Networking to access the markets and investments</li> <li>Capacity to access loan</li> <li>Knowledge in product quality, standardization, and regulation</li> </ul>

District	Roles	Skill Gaps
Rulindo	<ul style="list-style-type: none"> <li>▸ Activities on the farm</li> <li>▸ Manure marketing</li> </ul>	<ul style="list-style-type: none"> <li>▸ Assessment of product quality</li> </ul>
Rwamagana	<ul style="list-style-type: none"> <li>▸ Activities on the farm</li> <li>▸ Inputs procurement</li> <li>▸ Sell products in the markets</li> </ul>	<ul style="list-style-type: none"> <li>▸ Input use efficiency</li> <li>▸ Marketing strategies</li> <li>▸ Product certification</li> </ul>

Source: Focus group discussions and interviews

### Skill gaps

Despite the active roles of women and female youth in poultry production, the respondents shared the need to improve their skills in poultry production. Table 16 presents the skill gaps faced by women and female youth in poultry production such as good animal husbandry practices, animal disease management, animal housing improvement, technology adoption, input use efficiency, and assessment of product quality.

#### 4.1.2.3. Processing, Packaging, and Storage

##### Explanation

Some poultry processing companies may have their own farms to source the raw material. Another business model for poultry processing companies is called buyback model which a company sells inputs to the poultry farmers and buys chickens produced by the farmers. A company based in Mauritius, Avi Pro, has been planning an expansion in Rwanda and focus on broiler production. Avi Pro will apply a buyback business model. Such a partnership is considered convenient by the farmer because of secure feed supply and market. However, the contract may limit the farmers to use alternative feeds and marketing channels. The company aims to achieve competitiveness in the local market through large-scale production.



## **Box 2: Avipro – newcomer to the Poultry Industry in Rwanda**

Avipro, part of the Eclosia Group based in Mauritius, plans an expansion in Rwanda to meet the country's broiler demand. Eclosia Group annually produces 10,000–18,000 tons of chicken meat in Mauritius, Madagascar, and Kenya. The business model is a buyback scheme in which the company sells feed to the farmers and buys broilers produced by them. Feed is purchased from a company in Uganda and there remains a risk of inconsistent supply of feed. The company has a good track-record in finding alternative sources of feed and chicks in Africa. The company ensures biosecurity on the farm, product quality, and market availability. The expansion in Rwanda is expected to create job opportunities as well. The company commits to involve women in the operation because women are recognized for their good performance in different tasks for poultry production. In Kenya, 56 percent of employees in the breeding facility are women.

Source: Avipro interview

### **Fit for youth/female employment**

Beside on-farm activities, women and female youth also have employment opportunities in poultry processing, for example cutter, cleaner, packer, technician, and quality control supervisor. An interview with a representative from the poultry industry revealed that 56 percent of employees in poultry processing companies are female (see Box 2 **Error! Reference source not found.**).<sup>31</sup> For processing node, employment opportunities are eligible for skilled and unskilled female youth but lack of processing industries.

### **Skill gaps**

To access employment opportunities in poultry processing, skill gaps of women and female youth is minimal because there will be on the job training. In addition, the supervision roles in this node are eligible for high skilled women and female youth. The interview and focus group discussion identified the lack of knowledge about product quality assessment, regulations, and standards.

## **4.1.2.4. Distribution**

### **Explanation**

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<sup>31</sup> Rwanda Poultry Association interview, 15.11.23

Different distribution channels exist in the poultry value chain. Traditional poultry farmers usually sell chicken meat and eggs at the farm gate and/or in local markets that can be categorized as informal channel. Commercial farmers usually distribute through a formal channel with establishment of a contract with processing industries to supply retail, hospitality sector, and export markets (Figure 10). Informal export channel has been emerging since 2019 that potentially occur in the border with neighboring countries (i.e. Democratic Republic of Congo and Burundi (Figure 9)).

#### **Fit for youth/female employment**

Distribution shows a high employment opportunity for skilled and unskilled women and female youth. Because of the increase in national demand for chicken meat and eggs, direct selling and local markets can create employment opportunities. However, limited mobility because of social norms can be a barrier for women and female youth to take a role in distribution of poultry products.

#### **Skill gaps**

During the focus group discussion and interview, the respondents shared the need to improve their marketing skills. In addition, knowledge about export standards and regulations is still limited to skilled labor.

**Based on the above analysis the score for gender and youth participation, potential, and impact for poultry is 9.**

## **4.2. Risk and Vulnerability Analysis**

### **4.2.1. Ecological Suitability and Environmental Hazards at District Level**

Climate change has direct and indirect impacts on poultry production. Extreme weather events such as rising temperatures, flood, and drought, can affect poultry growth, reproduction, and health. Meanwhile, indirect climate change impacts result in disruption of feed availability and quality, water availability and quality, as well as pests and disease outbreaks (Abioja & Abiona, 2020). Based on the Rwanda's Climate Risk Profile, climate change trends in Rwanda are expected to increase the risk and intensity of flooding because of increased frequency and intensity of heavy rainfall (World Bank Group, 2021). In addition, drought is projected on the eastern and central areas.

Because the majority of the poultry population is concentrated in the Eastern Province, drought poses risks to poultry production (see Table 14). According to the interview with poultry farmer in Rwamagana district (Eastern Province), drought is the main cause of feed insecurity, whereas flood destroyed sheds and led to disease outbreak (Table 18). In addition, an extreme change in temperature was reported by a layer farmer in Rulindo district, Northern Province, and in Rubavu district, Western Province. Sudden change in temperature can cause heat- and cold-stress in hens, and eventually result in decreased egg production. Overall, the poultry farmers in Gakenke, Kirehe, Rubavu, Rulindo, and Rwamagana highlighted disease outbreaks as the main risk caused by environmental conditions.

To minimize the impact of environmental risks, mitigation measures for poultry production are required. Vaccination and feed supplementation (e.g. balanced amino acids, vitamins A, C, and E) are required to prevent severe health issues in chickens (Table 18). Water management is essential for implement mitigation measures for flood and drought (World Bank Group, 2022). Simultaneously, the poultry farmer in Rwamagana mentioned the urgency to develop rainwater harvest facilities for sustainable water management. To mitigate heat and cold stresses in poultry, ventilation (Table 18) and stocking density management are potential measures (Abioja & Abiona, 2020).

**Table 18: Environmental risks and mitigation measures identified by the poultry farmers in five districts in Rwanda**

District	Environmental Risks	Mitigation Measures
Gakenke	<ul style="list-style-type: none"> <li>▸ Landslide</li> <li>▸ Pests and diseases</li> </ul>	<ul style="list-style-type: none"> <li>▸ Land terracing, soil conservation</li> <li>▸ Pest warning</li> </ul>
Kirehe	<ul style="list-style-type: none"> <li>▸ Changes in temperature</li> <li>▸ Diseases</li> </ul>	<ul style="list-style-type: none"> <li>▸ Heating system in poultry sheds</li> <li>▸ Vaccination</li> </ul>
Rubavu	<ul style="list-style-type: none"> <li>▸ Heavy rainfall</li> <li>▸ Heat and cold stresses</li> <li>▸ Diseases</li> </ul>	<ul style="list-style-type: none"> <li>▸ Vaccination</li> <li>▸ Feed supplementation to boost immune system in chicken</li> </ul>
Rulindo	<ul style="list-style-type: none"> <li>▸ Heat and cold stresses</li> <li>▸ Diseases</li> </ul>	<ul style="list-style-type: none"> <li>▸ Improved ventilation</li> <li>▸ Vaccination</li> </ul>
Rwamagana	<ul style="list-style-type: none"> <li>▸ Drought</li> <li>▸ Flood</li> <li>▸ Diseases</li> </ul>	<ul style="list-style-type: none"> <li>▸ Rainwater harvesting</li> <li>▸ Vaccination</li> </ul>

Source: focus group discussion and interview

#### 4.2.2. Mitigation Measures

Besides mitigation, climate adaptation is needed to sustain poultry production. Cultivating climate-resilient feed crops and feed conservations strategies have the potential to maintain feed availability and quality under climate risks (Abioja & Abiona, 2020; World Bank Group, 2022). Specifically for heat stress in chicken, feeding manipulations can be done such as feeding fat that contains lower heat increment than starch, balancing amino acids in the diets, and organizing feeding time to avoid coincidence of the peak metabolic heat production with the highest point in the environmental temperature (Abioja & Abiona, 2020). Furthermore, breeding drought-resistant chickens is a potential adaptation measure in addition to vaccination prior to disease outbreak due to flood. To deploy measures and technology for climate mitigation and adaptation, the Rwanda Poultry Association can play a strategic role in knowledge transfer and capacity building.

The risks of rising temperatures, drought, and floods can be catastrophic for large-scale poultry production. Rearing chicken with appropriate stocking density in improved housing can minimize the damages caused by heat stress, decreased feed supply during drought, and disease outbreak due to flood. Small-scale broiler production in the

Northern Province was examined by Gil et al. (2021). The study shows potential resilience of small-scale broiler production system and strategic location to supply the export market in Democratic Republic of the Congo. Shifting poultry production system and areas will require further study to assess the feasibility in terms of social and economic aspects.

**Based on this analysis, the climate change impact (adaptation and mitigation) and other environmental benefits for poultry is scored a 1.**

### 4.3. Policy Analysis and Recommendations

A stand-alone policy specifically for poultry sector is still lacking in Rwanda. The policy for the poultry sector is included within the broader agriculture and livestock policies. The National Agriculture Policy (NAP), the Strategic Plan for Agricultural Transformation (PTSA), and the Livestock Master Plan (LMP) provide a framework for the poultry sector in Rwanda. These frameworks have been translated into laws and regulations (Table 18). The NAP focuses on sustaining natural resources and overcoming hunger, malnutrition and food insecurity (MINAGRI, 2018). It seeks to increase crop and livestock quality, productivity and production by modernizing agriculture and increasing resilience to climate change. The PTSA was initially developed in response to the need to transform agriculture. The latest PTSA included a strong focus on private investment in agriculture growth. The LMP presents the need to invest in genetic improvement and address animal feed and animal health challenges (Shapiro et al., 2017).

**Table 19: Policy instruments for poultry sector in Rwanda**

Category	Policy instrument
Strategies	<ul style="list-style-type: none"> <li>• Animal Nutrition Strategy Final Report, 14 April 2009. HTSPE Job No: 1007032 (MINAGRI, 2009)</li> <li>• Livestock Master Plan (MINAGRI, 2017)</li> <li>• National Agriculture Policy (MINAGRI, 2018)</li> <li>• Strategic Plan for Agricultural Transformation, Phase 4 (MINAGRI, 2018)</li> </ul>
Laws	<ul style="list-style-type: none"> <li>• Law No. 33/2002 of 06/11/2002 relating to the identification of domestic animals</li> <li>• Organic Law No. 53/2008 of 02/09/2008, establishing Rwanda Standards Board (RSB) and determining its responsibilities, organization and functioning</li> <li>• Law No. 54/2008 of 10/09/2008, determining the prevention of and fight against contagious diseases of domestic animals</li> <li>• Law No. 56/2013 of 09/08/2013, establishing Rwanda Council of Veterinary Doctors (RCVD) and determining its mission, organization and functioning</li> </ul>

Category	Policy instrument
	<ul style="list-style-type: none"> <li>• Law No. 31/2017 of 25/07/2017, establishing Rwanda Inspectorate, Competition and Consumer Protection Authority (RICA) and determining its mission, organization and functioning</li> <li>• Law No. 003/2018 of 09/02/2018, establishing Rwanda Food and Drug Authority (FDA) and determining its mission, organization and functioning</li> </ul>
Standards and codes of practice	<ul style="list-style-type: none"> <li>• Kenya Standards (KS) 1647: 2001, Code of Practice for Animal Feed Production, Processing, Storage and Distribution (this document is related to Kenya Standards, which inspired Rwanda Standards)</li> <li>• Rwanda Standards East African Standards 231: 2001: Bone Meal for Compounding Animal Feed Specifications</li> <li>• Rwanda Standards East African Standards 230: 2001: Maize Bran as Livestock Feed Specifications</li> <li>• Association of Official Analytical Chemists (AOAC) 942.05: Ash of Animal Feed</li> <li>• Rwanda Standards CAC/RCP 54: 2009: Code of Practice on Good Animal Feeding</li> <li>• Rwanda Standards 98: 2015: Animal Feed Production, Processing, Storage and Distribution Code of Practice</li> <li>• Rwanda Standards 99: 2017: Compounded Poultry Feeds Specification</li> <li>• Rwanda Standards 190:2019: Water Quality Livestock Feeding Tolerance Limits</li> <li>• Rwanda Standards East African Standards 90:2019: Compounded Poultry Feeds</li> <li>• RSB, 2020: Animal Feed Production, Processing, Storage and Distribution, Code Of Practice (RSB, 2020)</li> </ul>
Ministerial orders	<ul style="list-style-type: none"> <li>• Ministerial Order No. 013/11.30 of 18/11/2010 on transport and trade of meat</li> <li>• Ministerial Order No. 012/11.30 of 18/11/2010 on animal slaughtering and meat inspection</li> <li>• Ministerial Order No. 009/11.30 of 18/11/2010 on stray cattle and other domestic animals</li> <li>• Ministerial Order No. 008/11.30 of 18/11/2010 determining the organization of veterinary pharmacy practices</li> </ul>

Source: Saphiro et al., 2017

The policy analysis indicated gaps between the policy framework and implementation of strategies and regulations for poultry value chain (FAO, 2023). The gaps exist in the following components of the poultry value chains:

- Standard for slaughtering and meat handling enforcement mechanisms to make Rwandan poultry products competitive in export markets.
- Certification and inspection for cold-chain systems, slaughterhouse, and meat products.
- Feed law for feed processors and acceptable standards for feed ingredients.

- Poultry housing standards for local climatic conditions.

In 2018, Ministry of Finance and Economic Planning released District Development Strategy 2018-2024 (DDS) that includes specific targets for various sectors in every district in Rwanda. The summary of targets for the poultry sector in the DDS for 7 out of 10 districts targeted by this project is presented in Table 20. This contains targets regarding the number of chickens, production, markets, infrastructure, and trainings (MINECOFIN, 2018). Targets for the poultry sector are missing in the DDS for the Kirehe district in Eastern Province, as well as Nyabihu and Rubavu districts in Western Province.

**Table 20: Target of district development strategy (2018-2024) for poultry sector in Rwanda**

District	Province	Targets for poultry development
Rulindo	Northern	<ul style="list-style-type: none"> <li>▸ Increase in training from 5 to 24 sessions in 2024</li> </ul>
Gakenke	Northern	<ul style="list-style-type: none"> <li>▸ Increase in egg production from 3 tons in 2016 to 6 tons in 2024</li> <li>▸ Increase in chicken meat production from 1,700 tons in 2016 to 2,200 tons in 2024</li> <li>▸ Improved markets, value addition, and infrastructure</li> </ul>
Kayanza	Eastern	<ul style="list-style-type: none"> <li>▸ Increase in chicken meat production from 120,480 kg/month in 2016 to 232,480 kg/month in 2024</li> <li>▸ Increase in egg production from 262,844 kg/month in 2016 to 268,844/month in 2024</li> <li>▸ 2 new marketplaces</li> </ul>
Rwamagana	Eastern	<ul style="list-style-type: none"> <li>▸ Increase in number of chickens from 127,000 in 2016 to 7,327,006 in 2024</li> </ul>
Ngoma	Eastern	<ul style="list-style-type: none"> <li>▸ Double number of households raising poultry</li> <li>▸ Increase in number of marketplaces from 10 in 2016 to 14 in 2024</li> </ul>
Nyamagabe	Southern	<ul style="list-style-type: none"> <li>▸ To distribute chickens for households</li> <li>▸ To construct post-harvest facilities (slaughtering and packaging) and markets</li> </ul>
Huye	Southern	<ul style="list-style-type: none"> <li>▸ Increase in number of breed providers from 1 in 2016 to 14 in 2024</li> </ul>

Source: MINECOFIN (2018)

Closing the gaps between policy framework and implementation requires an instrument such as standards and regulations to achieve the targets of poultry production. Developing standards and regulations in poultry production including animal housing and management, certification, and feed is recommended to take place in the short

or medium term. Simultaneously, capacity building must be done to ensure all actors within the poultry value chain meet the standards and regulations. Specific policies, targets for poultry production, and capacity building initiatives should be tailored to each poultry production system. Commercial broilers and layers accounted for 68 percent of chicken meat and 66 percent of eggs production in Rwanda, although 75 percent of the total chicken population consists of local breeds raised in traditional system (Shapiro et al., 2017). Therefore, improved production in the traditional system requires more attention in policy-making, which can contribute to the vision of the Government of Rwanda in eradicating food insecurity, malnutrition, and poverty. Additionally, institutional arrangements must be strengthened for policy implementation. The DDS requires the elaboration of targets outlined in the NAP, along with support in resource mobilization, capacity building, and in monitoring and evaluation from the Ministry of Agriculture, National Agricultural Export Development Board, and the Rwanda Agriculture and Animal Resources Development Board.

**Based on the above analysis the score for institutional support for poultry is 5**

#### **4.4. Interventions for implementation**

The challenges in Rwanda's poultry value chain need to be addressed to enhance employment opportunity for youth and female youth. According to the assessment of poultry value chain, poultry farming activities are observed to have the highest employment opportunities for youth and female youth. However, major challenges exist that hamper the employment in poultry farming activities, such as lack of access to finance, limited technical skill, availability and accessibility of inputs. The following interventions are proposed to address the challenges in the short and/or medium term:

- Provide training to improve technical skills and knowledge in poultry farming management for farmers and people who are interested to start poultry farming.
- Strengthen capacity and institutional arrangements to provide veterinary and extension services for poultry farmers.
- Accelerate a financial mechanism that is accessible for different farmer groups, including young and female farmers, and farming size (small-, medium-, and large-scale farms).
- Enable environment for investment in production of feeds, medicines, and DOCs



Simultaneously, mitigation of risks is also required for a long-term intervention. We found that climate risks and diseases are the two main risks. These following strategies have potential for the risk mitigations:

- Enable technologies for climate mitigation and adaptation such as improved animal housing, soil and water conservation, as well as breeding resilient chicken varieties
- Implement animal health measures (e.g. vaccination and feed supplementation to improve chicken immunity/disease resistance) for disease prevention and treatment
- Enable environment for investment in climate mitigation and adaptation

The government of Rwanda has developed District Development Strategies (2018-2024) that can be suitable framework to implement the interventions in short and medium term. Some DDSs have included specific programs and training to develop the poultry sector. Nevertheless, the DDSs need to incorporate the acceleration of a financial mechanism and enabling the environment for investment. Furthermore, a framework for the long-term implementation of climate mitigation and adaptation in the poultry sector still needs to be developed. Such long-term interventions can be included in Rwanda's master plan to realize Vision 2050 that is developed by Ministry of Finance and Economic Planning.

## 5. Market systems analysis: Chilli

### 5.1. Market mapping

**Several studies have identified Chili as a crop holding significant economic potential in Rwanda.**<sup>32</sup> Chili has strong export potential and is a focus of government attention for increasing foreign exchange earnings. Chili is listed among several horticultural crops as a “High impact commodity” in the PSTA 4.<sup>33</sup> The National Agricultural Export Development Board (NAEB) in Rwanda has been actively supporting chili production and export. Rwanda's focus for the export market includes high-value, low-volume niche products, such as chilies. While chili is a high-potential export crop, most of the produce is currently consumed within Rwanda. Chili is cultivated by both small-scale and commercial farmers and is aggregated by various stakeholders, including wholesalers, cooperatives, exporters, and sometimes brokers.

**While there are several varieties of chili, the market dynamics, production potential and employment possibilities appear to be similar for all chili types.** The chili industry encompasses four main products: *pili pili (teja)*, *habanero*, *Scotch Bonnet chili* and *African birds eye chili pepper* (USAID, 2018b), (Van Keulen et al., 2022). While the different varieties allow for some price differentiation based on the different characteristics, there is significant overlap among chili varieties in terms of uses and processing potential.

**There appear to be significant differences in chili production at the district level.** There is no district-specific data available on chili production from official government sources, however a recent paper by Van Keulen et al (2022) contains district level production estimates based on FAOSTAT data.<sup>34</sup> These statistics show that there is significant variability between district and that chili production is concentrated in the Northern and Eastern provinces. It was not possible to interview farmer groups and producers in the chili value chain in each of the ten districts, but where interviews were conducted, field notes on the quality and suitability of the land are provided in Table 21.

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<sup>32</sup> (USAID, 2018a, 2018b; Van Keulen et al., 2022) among others

<sup>33</sup> This selection was made by MINAGRI based on a multitude of selection criteria such as agronomic and climatic factors, as well as economic factors such as the potential to reach export markets and for value adding activities (MINAGRI, 2018).

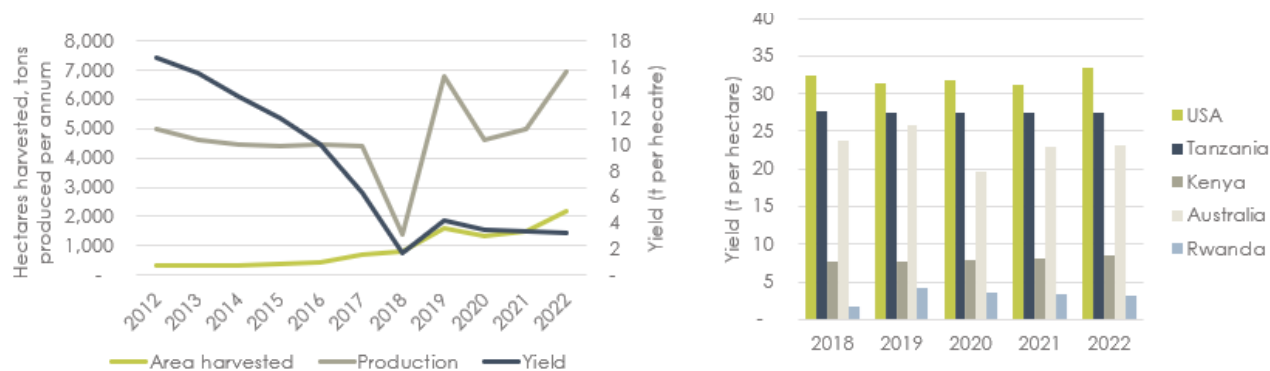
<sup>34</sup> Note that the method used for this is not clearly outlined in the Van Keulen paper and the team could not recreate these figures independently

**Table 21: Average annual production (2017, 2018 and 2019) by District, selected field notes on productivity**

Province	District	Chili (average tons per annum)
Northern	Rulindo	14
Northern	Gakenke	12
Western	Nyabihu	-
Western	Rubavu	-
Eastern	Kayanza	83
Eastern	Rwamagana	20
Eastern	Ngoma	1
Eastern	Kirehe	3
Southern	Nyamagabe	-
Southern	Huye	2

Source: (Van Keulen et al., 2022)

**Chili yields in Rwanda have declined significantly over the past decade and are currently well below regional and international competitors.** While chili production is not publicly available at the district or national level, the FAO provides statistics on chili production, area harvested and yield over time for the whole of Rwanda, based on a mix of official data and estimated or imputed values. Figure 12 shows a sharp decline in yield, from over 16 tons per hectare in 2012, to around 3 tons per hectare over the 5 years to 2022, the most recent year for which data is available. This would indicate that chili production has become significantly less efficient in the past decade. FAO data also shows that Rwanda is well below the yield of neighboring Kenya and Tanzania and also below the industrialized nations such as Australia and the USA.



**Figure 12: Chili production, area harvested and yield over time**

Source: FAOSTat, 2024<sup>35</sup>

**There is evidence of positive signs in recent years for the chili market both domestically and internationally.** While Figure 12 reveals some weaknesses in the Rwandan chili sector, the most recent five years have seen a surge in production and global market forecasts range from 5 percent to close to 10 percent annual growth through to 2030 for the global chili market <sup>36</sup>, reiterating that chili globally has a bright future and that there is potential for Rwanda to benefit from this growth.

**While anecdotal evidence suggests strong export potential, precise data on chili export performance is lacking and available data shows a mixed picture.** While international export markets have been growing, regional exports or cross-border trade are both limited, and international exports have been inconsistent over the past 5 years. On the domestic front, Chili is sold in district and larger markets in Kigali, with relatively small quantities being processed (Van Keulen et al., 2022). Fresh exports are still a small industry; and industry development currently focuses on building a strong fresh export industry and developing a secondary processing market and/or local fresh market (USAID, 2018b).

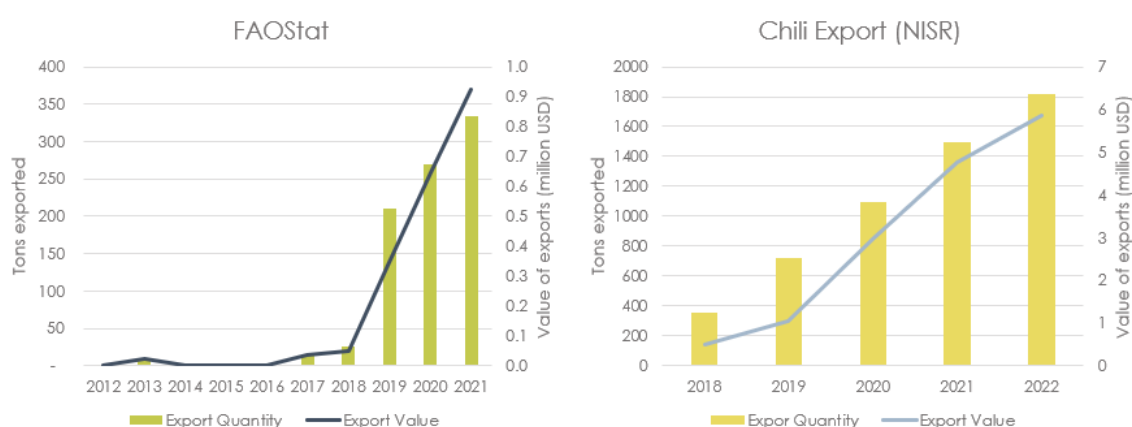
**Export data appear to show a large difference between formal and informal exports.**<sup>37</sup> National statistics from the NISR statistical yearbook show that exports of green and red pepper have grown significantly over the past five years, while FAOSTAT data which includes only formal sector trade show a similar trend, but much lower levels of exports. It is likely that NISR data show combined formal and informal sector exports, given that

<sup>35</sup> <https://www.fao.org/faostat/en/#data/QCL>

<sup>36</sup> <https://www.businessresearchinsights.com/market-reports/chili-oil-market-109795#:~:text=The%20global%20chili%20oil%20market,heat%20and%20flavour%20to%20food.https://www.digitaljournal.com/pr/news/prime-pr-wire/red-chilli-powder-market-size-is-expected-to-expand-at-a-9-7-cagr-forecasted-from-2023-2030>

<sup>37</sup> Chili are classified under HS Subheading 0709.60, *Fruits of the genus Capsicum (peppers) or of the genus Pimenta (e.g., allspice)*. Harmonized system (HS) is a standardized numerical method of classifying traded products, developed by the World Customs Organization (WCO).

this is the case for many commodities listed in the Statistical yearbook (NISR, 2022).<sup>38</sup> Further, UNComtrade data on exports show that there is significant annual fluctuation in export of Chili from Rwanda, and that the United Kingdom has historically been the dominant export destination, however for several of the last five years there have been no recorded exports to the UK in this database <sup>39</sup>.



**Figure 13: Chili exports from Rwanda 2018-2022, comparison of NISR and Comtrade data**

Source: FAOStat 2023<sup>40</sup> and NISR (2022), Statistical yearbook 2022

**Beyond the domestic markets there are now several companies with the capacity to export chili to international markets.** The major companies are listed below:

- Gashora farm Ltd: a leading Rwandan supplier of fresh and dried chili and chili oil to Europe, the U.S., and India markets. In 2019, Gashora farms signed a deal worth \$500 million USD to supply chili products to China<sup>41</sup>. The owner of Gashora, Dieu-donne Twahirwa is a success story of youth agripreneurship.
- Nature Fresh Foods: a horticulture exporting company that sources premium green chili, hot pepper, French beans, and passion fruits from 50 smallholder farmers from across 4 districts in Rwanda for exports to the EU.

<sup>38</sup> For many commodities, NISR report formal and informal exports separately, however for peppers the figures are combined.

<sup>39</sup> <https://comtradeplus.un.org/> and <https://oec.world/en/resources/bulk-download/international>

<sup>40</sup> <https://www.fao.org/faostat/en/#data/TCL>

<sup>41</sup> [http://www.chinafrica.cn/Homepage/202106/t20210611\\_800249217.html](http://www.chinafrica.cn/Homepage/202106/t20210611_800249217.html)

- Golden Cat Ltd: a mission-driven horticulture company that produces and sources high quality French beans, snow peas, sugar snaps, Bird- eye chilies, and passion fruits from 250 smallholder farmers, and exports to the EU.
- Freshpack International Ltd: a UK-based company that imports vegetables and fruits from various African countries to the UK and Europe.
- Floris Ltd: a supplier of organic horticulture products since 2001. Produces and exports fresh fruits including chilies, bananas and avocados to local and European market.
- Promagri Rwanda: specializing in production of dried birds eye chilies and export to Europe.
- Other companies include: Garden fresh, SOUK, IG Ltd, LOTEK Rwanda, Exodus Farm Ltd, Veggie fresh Ltd, S&I Fresh Ltd, Royal Group Company Ltd, High and Lum multi supply import & export Ltd.

Additionally, there are successful stories of entrepreneurs, such as the founder of Afri Foods, who have built businesses exporting crops like chilli to various countries, including Germany, the Netherlands, France, the UK, Belgium, and Dubai. Proxi fresh have also expressed recent interest in expanding their successful French bean export business to include chili production. There is also evidence of other players in the market (such as Fisher Global, based in Rwamagana), from field interviews.<sup>42</sup>

In Rulindo district, the Sina Gerard, or Urwibutso Enterprise, is a particularly impressive business employing 1400 staff, including 600 permanent workers and 800 casual workers. Around 70 percent of the staff are youth, and 60 percent are women. Chilli is being traded at national level and is being exported to USA, China, and other countries and the company stated that demand is higher than supply. While there has been strong development in the export market, some producers related difficulties in complying to the required standards, as well as the unstable nature of the export market: *"investors partnering with NAEB... disappear unexpectedly"*<sup>43</sup>. See section 2.1.2 for more detail on the types of standards required.

**Based on the above analysis, the score for market potential is 9.**

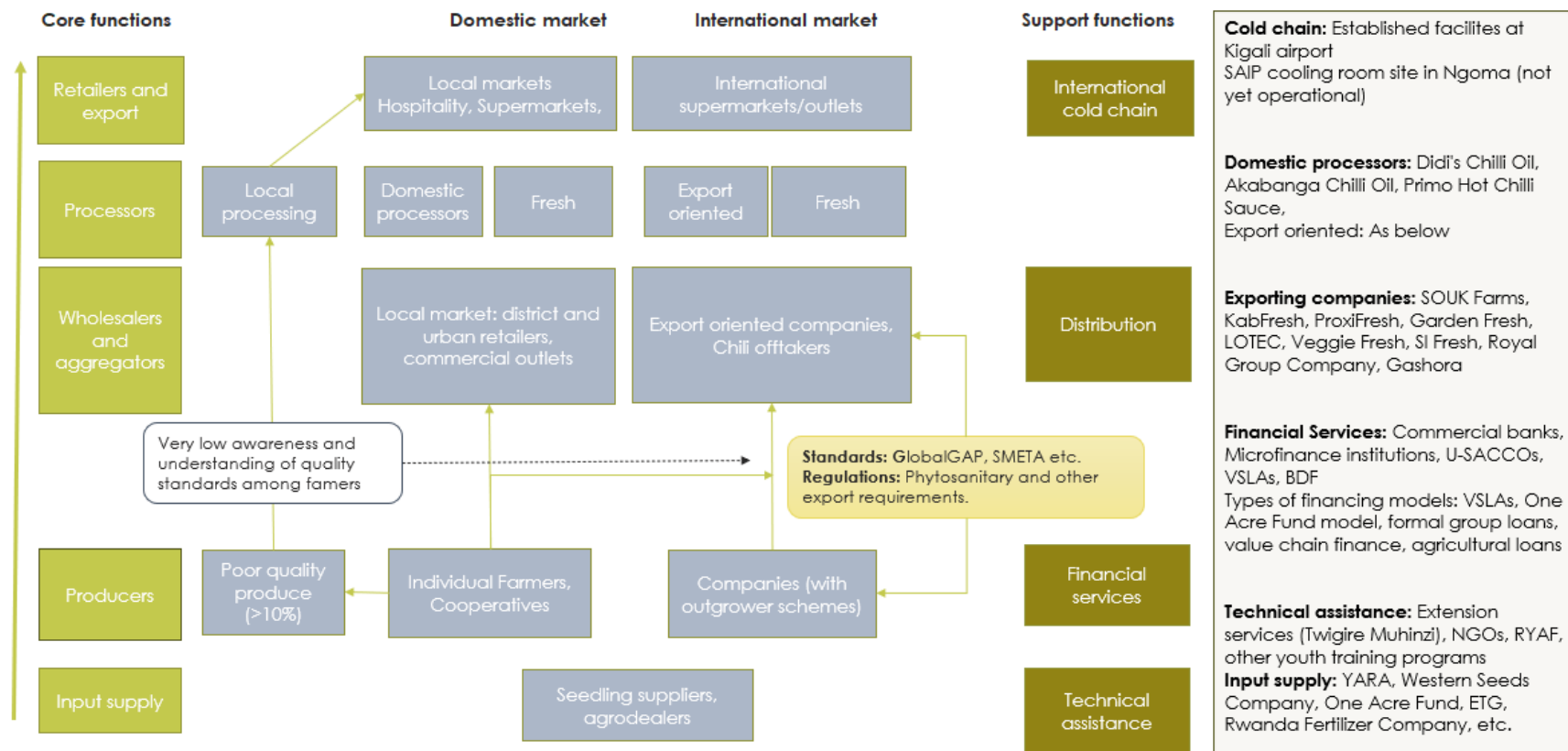
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<sup>42</sup> In Kayonza, the SERVE intervention helped chili farmers to sign a contract with Fisher Global Ltd. (Kay\_2 Women's groups in Kayonza, 14.11.23)

<sup>43</sup> Ngo\_5

### **5.1.1. Chili Value chain**

The chili value chain can be simplified into several key stages including: input supply, production, wholesale, and aggregation (including processing) and retail. An outline of the chili value chain based on field notes and existing literature can be seen in Figure 14. The value chain particulars and opportunities will differ by district depending on the presence of exporting companies such as SOUK in Rwamagana for example, that purchase from farmers, or the presence of major processing hubs such as Sina Gerard in Rulindo. Transport is also a key underlying difficulty in chili production and distance to potential markets is also variable by district.



**Figure 14: Chili value chain**

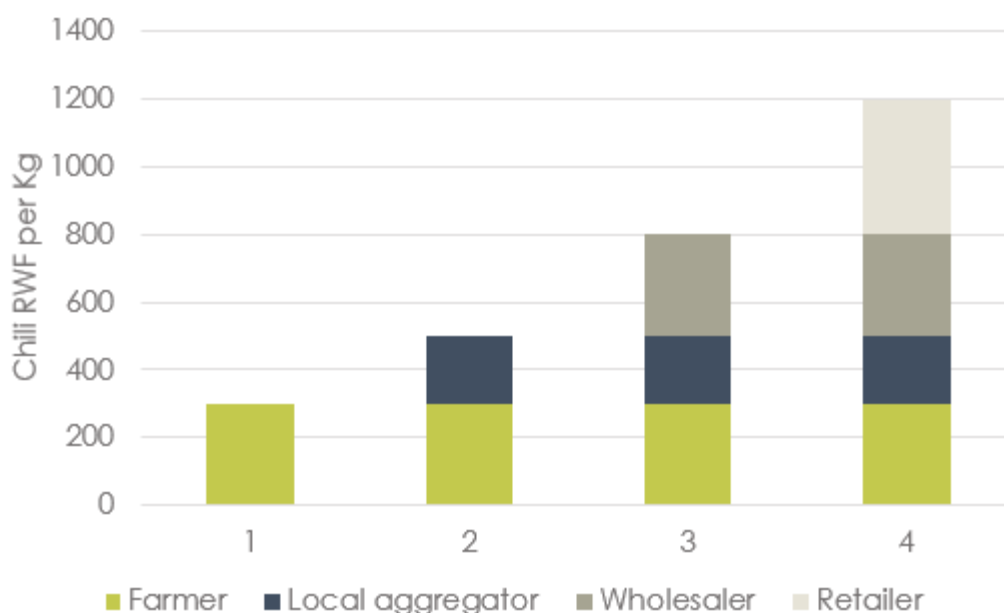
Source: Field interviews, \*Districts not covered specifically for Chili production: Nyabihu, Nyamagabe, Rubavu, USAID (2018b), Van Keulen et al. (2022)

Field interviews in Rwamagana showed a limited local processing capacity (processing poor quality chili into oil for local markets), while in other districts there was no evidence of this.<sup>44</sup>

<sup>44</sup> Rwa\_7, Gak\_8, Huy\_3, Kir\_11,



**From a domestic perspective, a relatively low proportion of value added is captured at the producer level**, however this points to the importance of value adding activities for actors along the value chain. Figure 15<sup>Error! Reference source not found.</sup> shows the price build up at various stages of the value chain when supplying the domestic markets.



**Figure 15: Value added for domestic consumption**

Source: Van Keulen et al. (2022)

#### 5.1.1.1. Pricing

**Chili producers complain of a lack of price negotiating power in the market.**<sup>45</sup> The monopsony issue is also raised by a 2018 USAID paper, however the situation in terms of the number of major chili-exporting companies has changed dramatically in the last 5 years as outlined above, and smaller players are also entering the market. Domestic markets allow more negotiating room, however there are also lower prices generally associated with local markets as opposed to export oriented production. Chili prices are **seasonal**, reflecting the growing season of Rwanda. Prices peak at the start of the growing Season A in August, and at the start of Season B in March, and are at their lowest at the end of these growing seasons in December and May, when production is at its highest (Van

<sup>45</sup> Kir\_2, Rwa\_7 among other interviews

Keulen et al., 2022), (Hunter. R., et al., n.d.).<sup>46</sup> Field interviews support the assertion that prices fluctuate significantly with seasons.

### 5.1.1.2. Supporting services

**Field interviews indicate that extension services for smallholder chili farmers are limited.**

While there is not much evidence available, it would appear from field interviews that extension services do not cover chili, because available staff focus on maize or have not been trained in chili cultivation. Twigiri Muhinzi is focused on crops under **land use consolidation**, meaning that for many chili farmers at the smallholder level, Twigire Muhinzi does not reach them <sup>47</sup>. This response was also echoed among women's groups **within the chili value chain, who indicated that they do not receive extension services under Twigiri Muhinzi or SSIT** for similar reasons <sup>48</sup>.

**Chilis are covered by the National Agriculture Insurance Scheme (NAIS).**<sup>49</sup> Often agricultural insurance is required to qualify for agricultural finance and the support of NAIS is important in improving access to finance. There is a strong will from the government to support the chili value chain, but there is a need for land consolidation among chili producers to improve access to finance and access to extension services. This could take the form of cooperatives or associations of dedicated chili producers. Chili is seen as a crop for progressive farmers, by people who invest in the production systems. **Unfortunately, chili producers are not eligible for agriculture input subsidies.**<sup>50</sup>

**The government supports women through various means, such as offering training programs focused on gender equality, leadership, and involvement in commercial agriculture.** Women are encouraged to pursue business projects, which may be eligible for grants from the Business Development Fund (BDF, as described in chapter 10.1.4.1. On these loans, women contribute 70 percent, while the remaining 30 percent is covered by the government.

### 5.1.2. Value Chain Nodes

Each node of the value chain is discussed in turn in the following subsections.

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<sup>46</sup> Historical price data provided by E-soko over the 2017-2020 period. [E-soko](#) is an online agricultural trading hub in Rwanda.

<sup>47</sup> Huy\_3, Kir\_11, Ngo\_5

<sup>48</sup> Kay\_4, Nyam\_5

<sup>49</sup> Acre Africa interview 7.11.23 Kig\_15

<sup>50</sup> Only crops under the Crop Intensification Program (CIP) fall under the input subsidy scheme: maize, wheat, rice, Irish potato, beans, and cassava

### 5.1.2.1. Input supply

#### Explanation

Chili farming commences with **nursery preparation**, typically initiated 45 days before the planned plantation date. Farmers set up nursery beds and optimize conditions for seedling growth through mulching, fertilizer application, and irrigation. The cost of preparing the nursery, including mulching materials and irrigation, averages around 200,000 RWF. **Quality seeds** are a fundamental requirement for successful chili cultivation. Farmers often procure seeds from reputable suppliers like TUBURA or One Acre Fund. The preferred varieties, such as "Habanero" and "Teja," are selected based on their yield potential and market demand. The cost of a 200g package of quality chili seeds ranges from 1,000,000 RWF to 1,200,000 RWF.<sup>51</sup>

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<sup>51</sup> Gak\_8, Huy\_3, Kir\_11, Ngo\_5, Rul\_10

## Box 2: One Acre Fund

The One Acre Fund (OAF) business model is to supply farmers with everything they need to grow more food and earn more money. This includes training on planting, crop health and soil health, as well as agricultural inputs such as seed and fertilizer. The Fund also provides farmers with credit, crop insurance and a market for cash crops. One Acre Fund is expanding its operations dramatically, to the point where it has become the main/only supplier of subsidized fertilizer in several districts in Rwanda. OAF is considered the main supplier of fertilizer in the SERVE project districts of Rubavu and Nyabihu.

OAF in Rwanda can sell direct to farmers or act as an agrodealer supplying fertilizers through the Agro Processing Trust Corporation (APTC)<sup>52</sup>. One Acre Fund provides quality farm inputs on credit, which farmers repay over the full growing season. Farmers in the One Acre Fund program pay 75 percent of the price directly for fertilizer and repay the remaining 25 percent in installments after harvesting. The products are delivered within walking distance of farmers' homes, in time for planting. Farmers are also trained in the latest agricultural practices as well as in marketing.

See section 10.1.5.2 for more information on OAFs financial structure

Source: <https://oneacrefund.org/> Field interviews (Unique land use, 2022)

## Skills gaps and barriers

No specific skill gaps were identified from the field interviews with respect to input supply. Financial literacy and input use efficiency were both raised as issues among stakeholders which could potentially apply at the level of input supply, however there were no specific gaps related to running agro dealerships or working on the input supply market. The wide breadth of knowledge required to run an agrodealership or to work for one of the major input suppliers such as Agrotech, Balton, Holland Greentech, Sodiaco was not covered by the study.

## Fit for youth/female employment

**Given that input supply was highlighted by any chili producers as a limitation to production, it would seem that there is insufficient supply of inputs at an affordable price point.** The issues with regard to the import of agricultural inputs could represent a

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<sup>52</sup> The Agro-Processing Trust Corporation (APTC) is a parastatal organization involved in multiple agricultural activities

commercial market opportunity, however it is not realistic to expect much employment within this sector, given the high degree of regulation governing inputs and the very large capital outlays required to be part of this market. Further, Van Keulen et al., 2022 estimated that only around 100 employed positions would be available within this node at the import stage. The study further estimates that the cost to start an agrodealership is around 790,000 RwF, far beyond the financial means of average smallholder farmers (Van Keulen et al., 2022).

At the input level there are opportunities through nurseries and agrodealers, however there are established businesses offering these services and paid positions working at the store are relatively few – each agrodealer employs are 2-3 people per shop. In many districts, One Acre Fund is main input supplier (Tubura).<sup>53</sup> Van Keulen et al (2022) also found that there are opportunities for educated youth in agripreneurship to start small agro shops and work in existing agro-wholesalers and agro shops. However, there are a limited number of such positions available (Van Keulen et al., 2022).

Women make up a significant part of all activities in the chili value chain including input supply and nursery activities. Field interviews from both men and women noted that women are highly suited to nursery activities because of their patience and skill in managing delicate seedlings. It was also suggested in the field interviews that seed multiplication is a potential business opportunity, however no further detail was given. There was a strong indication from field notes that women and men can participate in all activities along the value chain.

### 5.1.2.2. Production

#### Explanation

Once the seedlings are ready for transplantation, farmers prepare the land through deep plowing and leveling of the land. Where soil acidity poses a challenge, lime application is necessary, costing approximately 50,000 RWF per hectare. Fertilizers play a crucial role in ensuring robust chili plant growth. Organic inputs, primarily sourced from on-farm livestock, are combined with inorganic fertilizers like DAP (diammonium phosphate) and NPK (nitrogen-phosphorus-potassium). The reported cost of fertilizers and land preparation is between 400,000 to 600,000 RWF per hectare.

**Proactive pest and disease management** are critical for ensuring healthy chili plants. Farmers commence pesticide application immediately after transplantation and the

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<sup>53</sup>Huy\_3

cost of pesticides for disease and pest control, per hectare, averages around 150,000 RWF. As part of **early care practices**, farmers prioritize irrigation, especially during dry seasons or drought periods. Irrigation equipment, including machines and watering cans, is procured to ensure adequate moisture levels for optimal plant growth. The cost of irrigation equipment varies but typically ranges from 100,000 RWF to 200,000 RWF.<sup>54</sup>

**Production level:** Women are involved in all aspects of production (aside from pregnant women working with agrochemicals), including land preparation, fertilizer application, irrigation, maintenance, and harvesting. Field interviews reported that traditional irrigation involves carrying very heavy loads of water long distances and as such men tend to work in this kind of irrigation due to the physical requirements. Pesticides application is also generally undertaken by men, given that pregnant women may suffer harmful impacts from pesticides. This risk is present whether a women knows that she is pregnant or not and has therefore developed into a convention of agricultural practice in Rwanda. Aside from these two areas, all aspects of production are suitable for female youth.

**Harvest and post-harvest management:** In terms of harvesting, many farmers pointed to the prolonged harvest period of chili as an advantage to balance out the impact of seasonality on smallholder incomes<sup>55</sup>. Further, chili production requires significant seasonal labor, meaning that it can also generate a lot of employment.

The technique of chili harvesting can be improved to maximize profits and generate opportunities for female employment (see Table 22 **Error! Reference source not found.** for details). There is also strong anecdotal evidence from field interviews and literature that female workers are particularly well suited to the patient and delicate work of selecting and picking ripe chilis of high quality.

**Post harvest loss is also a major issue in the chili sector.** A comprehensive 2018 study of post-harvest loss in the chili sector in Rwanda found that overall, rough handling, transport and lack of temperature management resulted in high losses (17 to 24 percent damage, 13 percent weight loss and related loss in market value upon arrival at the packinghouse) (USAID, 2018b). For details on this see **Error! Reference source not found.** below.

### Box 3: Factors and solutions regarding post-harvest loss in Chili production

#### Factors contributing to post-harvest loss:

<sup>54</sup> Gak\_8, Huy\_3, Kir\_11, Ngo\_5, RuI\_10

<sup>55</sup> Kir\_2

**Inputs:** Insufficient attention to seed quality is evident, as growers frequently resort to using poor-quality, saved seeds.

**Knowledge:** Key deficiencies include inefficient harvesting practices that contribute to mixed-grade outputs and increased product deterioration. The practice of harvesting only once per week results in a supply of mixed maturities, leading to an overall lower grade of produce. The issue is exacerbated by rough handling during harvesting, causing damage and accelerating the rate of deterioration.

**Cold Storage:** The absence of cold chains or cool storage facilities poses a significant challenge in the green chili value chain. Leaving green chilies at ambient temperature for 24 hours after harvest resulted in a substantial 13 percent weight loss. The deficiency in proper cool storage at the farm post-harvest stands as a major limitation, emphasizing the need for measures to minimize weight losses early in the value chain.

**Farmer Organization:** Growers find themselves in a disadvantaged position due to a lack of bargaining power when selling their produce to exporters. Additionally, transparency issues are prevalent, with a noticeable absence of clear standards for grading and sorting, further hindering the fair representation of the produce in the market.

**Processing:** The value chain faces a significant setback in terms of processing options, presenting minimal opportunities for growers to add value to their produce. The absence of robust processing avenues restricts the overall potential for value addition within the chili production sector.

**Recommendations:**

**Training for Better Practices:** Train leaders and trainers in cooperatives on using high-quality seeds, smart harvesting practices, and gentle handling. Focus on multiple harvests per week, wearable harvest picking bag use, and improved postharvest methods, including sorting standards and installation of shade structures.

**Hands-On Demonstrations:** Set up training centers for cost-effective practices in reducing postharvest losses. Demonstrate maturity indices, wearable harvesting bags, and the use of shade structures. Provide guidance on managing cool storage and support small-scale processing for value addition methods like solar drying and sauce making.

**Promoting Business Opportunities:** Encourage partnerships between exporters and growers for increased profits. Explore local manufacturing of dried chili products tailored to local preferences. Emphasize adding value to Grade 2 or rejected produce through processing.

Source: USAID (2018b)

Given that post-harvest losses are such a major issue for chili production, a shortlist of potential mechanisms for reducing post-harvest loss and the associated costs are provided below in **Error! Reference source not found.**Table 22 and Table 23.

**Table 22: Use of maturity indices for green chili harvesting twice per week**

<b>Start with 1000 kg</b>	<b>Current practice</b>	<b>New practice</b>
Harvest practice	Harvest once per week, mixed maturities	Harvest two times per week, all fruits at dark green stage, proper size and maturity for Grade 1
Labor for extra harvest		5,000 Rwf (\$US5) for 5 persons
Cool storage in charcoal cool room until pickup		1,000 per day for 3 days = 3000 Rwf
Relative cost		+ 8000 Rwf (\$US10)
percent Loss	75 percent grade 1 25 percent grade 2	90 percent grade 1 10 percent grade 2
Value per kg (excellent quality)	750 kg at 600 Rwf (\$0.92) 250 kg at 200 Rwf (\$0.31)	900 kg at 600 Rwf (\$0.92) 100 kg at 200 Rwf (\$0.31)
Market value - costs	\$768	\$847
Relative profit		\$79 per 1,000 kg

Source: USAID (2018b) - note that prices have been adjusted for inflation

The second cost/benefit example involves using shade to protect green chili fruits during delays or marketing. This simple and affordable technology reduces pulp temperature by 10 to 15°C. The initial cost pays off after 10 uses, and each subsequent use adds \$7.51 per 100kg load – similar savings per 1,000 kg as listed above.



**Table 23: Use of shade for harvested green chilies in Rwanda during delays and transport**

Start with 1000 kg	Current practice	New practice
	Leaving chili in direct sun	Use of shade to provide lower temperature for produce during delays, transport or marketing
Simple portable shade structure		\$USD61.41
percent Loss	13 percent	5 percent
Total revenue for 100 kg (\$0.75 p kg))	\$80	\$87.51
Relative profit		\$7.51 per 100 kg

Source: USAID (2018b) – note that prices have been adjusted for inflation

**Market Exploration:** Evidence from interviews indicates that marketing and sales are traditionally done by men in general in Rwanda.<sup>56</sup> Many interviewees stressed the lack of price negotiating power on behalf of the sellers and this is seen as a structural issue (too few purchasers on the market).

## Skills gaps

**Field notes stressed that farmers lack technical knowledge specific to chili production, in particular with respect to pest and disease management,** however also regarding input use efficiency and quality, post harvest management. Women's groups and general farmer groups mentioned the same issues, and both lamented the lack of extension services as discussed in section 5.1.1.2.

## Fit for youth/female employment

**Women are involved in all aspects of the chili value chain, but tend to take a major role in the production stage in particular.** Some districts reported that the ratio of women to men in agricultural production is 80:20, or as high as 90 percent in some areas, however in later stages of the value chain like processing, this falls to below 10 percent.<sup>57</sup> Field interviews indicate that men typically engage in tasks requiring physical strength, such

<sup>56</sup> The study did not determine any breakdown of male and female employment for chili specifically, at this node of the value chain.

<sup>57</sup> Womens' group Kay\_2, Rwa\_6, Ngo\_5

as pest and disease management, due to their ability to handle heavy pumps during pesticide application.

Field interviews reported that men dominate decision-making processes and ownership of Chili farms, despite the significant involvement of women in labor.

### 5.1.2.3. Processing

#### Explanation of node

**Processing:** Sun drying is a standard practice for chili, which is effective during summer weather. Dried chilies are stored in warehouses with hot air to prevent moisture and post-harvest loss. There are established chili processors across the districts, and field interviews were conducted with larger scale operators in Rulindo, Rwamagana, and Kayanza. These processors reported that women are employed in high numbers in the processing of chili and are valued workers. Estimates varied, but permanent labor was estimated at around 40 percent women, and temporary or seasonal labor is made up of 90 percent women.<sup>58</sup> According to key informant interviews, women are well suited to activities in the processing and packaging stage, as women are reportedly seen to have more patience. According to a recent study by USAID, chili packing is dominated by women, who often receive training through NAEB or a packinghouse manager to sort and grade produce (USAID, 2018b).

Processing chilis into dry powder is also recommended by the 2018 paper. This investment would require \$12 of extra labour effort, as well as \$100 capital investment for jars for packaging, but would result in a relative profit of \$3,478 per ton of chili compared to standard sales processes USAID (2018b).

#### Fit for youth/female employment

**Woman can and do have substantial roles in the processing industry, as shown in the case of Sina Gerard in Rulindo.** The firm boasts a substantial female workforce, with women constituting over 60 percent of its employees. Within the company, women take on diverse roles, from cleaning bottles and maintaining sanitation standards to branding products with appropriate etiquettes. Additionally, they contribute significantly to administrative functions, demonstrating their multifaceted capabilities. Women play integral roles in the firm's administration, showcasing their involvement in

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<sup>58</sup> Fisher Global Ltd (Rwa\_6)

both operational and managerial capacities, thereby highlighting their crucial contributions across various aspects of the organization.<sup>59</sup>

## **Skills gaps and barriers**

For women in the processing industry, finding balance between work and life can be tough. With long, uncertain hours and limited flexible options, managing career and family responsibilities becomes a real challenge. Simplifying and improving work arrangements can help women better navigate these demands, promoting their overall well-being and success in both professional and personal spheres<sup>60</sup>.

## **Employment opportunities**

Commercial sector processing employment opportunities are severely constrained. The presence of a commercial processing enterprise is a prerequisite (companies such as Fisher Global in Rwamagana or Sina Gerard in Rulindo), and within this node the absolute number of jobs is very small. Very few farmers reported doing their own low level processing besides sun drying and packing chili (activities which could also be considered part of the production phase).

### **5.1.2.4. Wholesale/Retail**

#### **Conformance to Market Requirements and Standards**

**Standards function as guidelines for the sustainable production, sale, and acquisition of products, but the level of standardization is low among smallholder farmers.** Interviews with business owners related that there is generally a low level of awareness of standards among smallholder farmers, but that there is guidance available from supporting institutions such as NAEB. Compliance with chili standards is instrumental in assisting farmers to enhance the quality of chili products, however smallholder farmers including youth and women farmers often find it challenging to comply with European fresh market standards and certifications.

**Standards tend to play a greater role in export export-oriented businesses and do not influence local demand or production.** Adherence to standards significantly contributes to health protection and appeals to a wide customer base, as customers place trust in products that meet established criteria. Large scale producers and processors are well

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<sup>59</sup> Rul\_2 (Interview with Sina Gerard)

<sup>60</sup> Rul\_2 (Interview with Sina Gerard)

aware of GAP, SMETA and other standards. Export products must meet accepted standards, while Rwandans generally show less concern in this regard. For producers, the requirements begin in the field, assessing cultivation techniques, pesticide, and fertilizer application, harvesting methods, transportation, and processing. Within the processing step, this involves an evaluation of ingredients, including the proper quantities of sugar, salt, and other components at appropriate measures.<sup>61</sup> Achieving certification is significantly easier for large scale enterprises relative to smallholder farmers.

**Cold storage:** Facilities exist for chili cold storage, which is useful during the summer in particular to maintain a controlled temperature between 2 and 8 degrees Celsius. At the time of writing there is one cold storage facility at Kigali Airport, available for commercial use, and "Get It", a commercial logistics firm has also recently built a cold storage facility. These facilities help to preserve the quality of perishable goods, showcasing the investment potential in cold storage facilities. Despite challenges like high energy costs, labor expenses, and equipment maintenance, advancements in technology and innovative storage solutions contribute to improved efficiency and reduced operational costs in cold storage operations. Some exporters complained that cold storage facilities are not well managed at Kigali Airport<sup>62</sup>. At this stage of the value chain, there is very little information on employment breakdown between females and males.

## Skills gaps and barriers

Addressing the multifaceted challenges faced by chili farmers requires a holistic approach encompassing knowledge enhancement, financial support, market access, and farming strategies. One critical issue is the pervasive lack of knowledge surrounding chili farming, particularly among young women who often do not view farming as a viable career option. This knowledge gap extends to understanding the chili market dynamics, including standards and value chains, exacerbating difficulties in planning and decision-making. Moreover, financial constraints further impede progress, with insufficient capital for both startup costs and ongoing expenses like supplies and equipment. The absence of collateral complicates access to loans, exacerbating the financial burden on farmers.<sup>63</sup>

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<sup>61</sup> RuI\_2 13.11.23 interview with regional processor

<sup>62</sup> Exporters complained of workers leaving the refrigerated doors open which leads to increased higher rejection rates at the importer stage.

<sup>63</sup> Rwa\_7 interview with wholesaler and processor Chili

### 5.1.2.5. Challenges and constraints

To summarize the main issues highlighted from the field interviews, the main issues revolve around working conditions, youth engagement, access to capital and skills, gender-related challenges, market and production constraints, climate change risks, pest and disease management, market fluctuations, and women's ownership barriers.<sup>64</sup>

**In the processing industry in general, there are extended and unpredictable working hours:** The working hours in agriculture often extend beyond the standard 6:00 AM to 5:00 PM timeframe, causing challenges in maintaining work-life balance. Task-based time determination and lack of structured hours contribute to unpredictability, posing difficulties for personal and family commitments, particularly for young women.

**Youth Reluctance and Negative Perception:** Youth reluctance to engage in agriculture stems from a preference for leisure and a negative perception that views agriculture as suitable only for orphans or vulnerable individuals. Formal education tends to emphasize job-seeking over entrepreneurial pursuits in farming, contributing to a mindset shift challenge in adulthood.

**Limited Access to Capital and Skills:** The challenge of starting capital is downplayed by respondents, emphasizing a savings culture. However, insufficient savings and inadequate collateral pose barriers to securing loans for agricultural ventures. Additionally, there's a lack of skills and techniques related to commercial agricultural production. Farmers also noted that financial products do not account for seasonality in terms of when farmers are able to repay loans.

**Gender-related Challenges:** Social norms impede women from actively participating in agricultural production. Women face limitations in decision-making regarding land use, restricted access to household income for investments, and barriers to accessing finance due to collateral requirements. The burden of household activities further limits their involvement in agribusiness. Women's ownership of chili farms faces obstacles such as a lack of investment, limited capacity building, and societal norms restricting their participation in farm ownership. Addressing these challenges is vital for promoting gender equality and empowering women in agriculture. Only one producer group in Kirehe stated that the number of women owning chili farms is the same as men (Kir\_11).

**Market and Production Constraints:** Limited access to equipment meeting regulatory standards, low investment in production, post-harvest handling, and processing, as well as high transportation costs, contribute to challenges in the agricultural market. The

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<sup>64</sup> Huy\_3, Kir\_11, Ngo\_5, Rwa\_6, Kay\_2, Gak\_13, Rul\_2

concentration of the customer base, small and scattered land, and low productivity in traditional farming systems add to these constraints.

**Climate Change and Variability:** Climate change and variability pose significant risks to agricultural practices. The challenges include the inadequacy of irrigation facilities, poor market orientation among farmers, and limited access to post-harvest technologies, leading to erosion control issues.

**Pest and Disease Management:** Chilies are susceptible to various pests and diseases, including aphids, mites, whiteflies, and fungal infections. Effective pest management strategies are crucial to minimize crop losses and maintain quality.

**Market Fluctuations:** While chili production is seen as a profitable crop by most farmers, as with many agricultural commodities, the demand and prices for chili peppers can fluctuate, making it challenging for farmers to predict income and plan production effectively. Market fluctuations contribute to financial instability and lower profits for farmers.

**Based on the above analysis the score for gender and youth participation, potential, and impact participation for chili is 8.**

## 5.2. Risk and Vulnerability Analysis

Peppers are warm season crops and grow best in many types of soil with a pH between 6 and 7. Peppers do not tolerate waterlogged soil and should be planted in a well-drained soil or raised bed. Peppers should be planted in an area that receives full sun for most of the day (e-Hingirisoko, 2023).

**Soil:** Chili peppers prefer areas that are warmer, not prone to frost, and have access to water. The optimum soil moisture content is 60 percent, but it does not do well in waterlogged areas as it has shallow roots. The optimum pH range is 6.0-7.0

**Rainfall:** Chilies require about 600 mm of water during the growing season in the form of rain or irrigation. During flowering and fruit set, water should be sufficient, and waterlogging should be avoided as the crop is sensitive

**Temperature:** Chilli requires optimum temperatures ranging from 18°C - 30°C and temperatures below 10°C it stops growing. Temperatures above 38°C make the crop susceptible to fruit and flower abortion

**Altitude:** Chili grows well at altitudes up to 2,000 meters above sea level

Table 24 details the perceived environmental risks for chili at the district level as reported from key informant interviews.

#### Box 4: Pepper

Peppers grow well in warm conditions and have a long growing season. The plants require a warmer climate than tomatoes and are more sensitive to frost. Temperatures between 5°C and 15°C result in poor growth. Temperatures around 24°C are optimal for most green pepper varieties. Despite the need for warm conditions, the plant is sensitive to higher temperatures. Above 32°C, flowers tend to drop and few, if any, fruits will set at temperatures above 35°C, especially if these temperatures are coupled with dry winds. Fruits that do set at such high temperatures are usually misshapen. The fruit is also very susceptible to sunburn. All chili peppers are varieties of several plant species in the genus *Capsicum*, including *Capsicum annuum* (e.g., jalapeños and cayennes), *C. frutescens* (e.g., tabasco and piri piri), *C. chinense* (e.g. habaneros and scotch bonnet), *C. pubescens* (e.g. rocoto and locoto), and *C. baccatum* (e.g. aji), and their hybrids, which include some of the hottest peppers known.

Source: e-Hingirisoko(2023)

### 5.2.1. Ecological suitability and environmental hazards at district level

Despite the differences in production volumes, farmers across the districts related fairly consistent views on the suitability of their land, and also similar risks. There is generally a very positive view of the profitability of chili, and key risks are for the most part consistent with those outlined in section 3. Table 24 summarizes the main responses from the field, with links to the interviewed groups.

**Table 24: Farmer perspectives on ecological suitability and production risks by District, selected field notes on productivity\*\***

District	Field notes on productivity/suitability	Risks	Source
Rulindo	Highly profitable with strong market linkages The land in Rulindo district is suitable for chili farming	The major environmental risks are drought and frost**. Drought risk can be managed through irrigation, but materials are expensive	Rul_10 Rul_2

District	Field notes on productivity/suitability	Risks	Source
Gakenke	<p>Farmers suggest highly suitable land and very profitable value chain</p> <p>The district's land is well-suited for chili cultivation, yielding superior results compared to other crops.</p> <p>The district benefits from suitable soils and climatic conditions that create an advantageous environment for the cultivation of horticultural crops.</p> <p>Farmers in the district express a willingness to grow horticultural crops, indicating a positive attitude towards engaging in the cultivation of these valuable crops.</p>	<p>The environmental risks and their management include the following;</p> <p>Landslides: (contour lines and dig holes to avoid water runoff)</p> <p>Floods: bamboo on the ridges to avoid more flooding ;</p>	Gak_8, Gak_13
Nyabihu	N/A	N/A	
Rubavu	N/A	N/A	
Rwamagana		<p>Climate change: Climate change can affect the growth and yield of chili crops, as changes in temperature and rainfall patterns can alter plant growth, flowering, and fruiting. Extreme weather events such as droughts, floods, and heat waves can also damage crops.</p> <p>Soil quality: Chili plants require well-drained, fertile soils with a pH between 6.0 and 7.5. Soil erosion, nutrient depletion, and soil-borne diseases can reduce soil quality and productivity, which can be a major challenge for farmers.</p>	Rwa_6
Ngoma	Easy access to water for irrigation due to the marshlands and lowlands makes the district suitable for chili	The main environmental risks are drought, snowy rains, pest, and diseases.	(Ngo_5)
Kirehe	The land is suitable for chili, but requires land preparation: Fertilizer treatment includes manure, DAP as basal and NPK as top dressing application.	The main environment risks are drought and unexpected weather with too much or less rain than expected which can raise unknown pest and diseases resistant to many available pesticides	(Kir_2)
Nyamagabe	N/A	N/A	
Huye	The land is suitable for chili production; chili is resistant to climate	The Huye landscape confronts challenges from climate change, with floods, soil erosion, and land	Huy_3



District	Field notes on productivity/suitability	Risks	Source
	change and offers more stable harvest periods and income	degradation affecting 90 percent of its abrupt, sloping lands.	

Source: Field interviews as indicated, \*Districts not covered specifically for Chili production: Nyabihu, Nyamagabe, Rubavu \*\*Interviewees reported "snow" but this was assumed to be frost as there is no snow in Rulindo

### 5.2.2. Mitigation measures

General measures to mitigate environmental risk for horticulture value chains have been illustrated in Chapter 3.1.3. Here we present a series of chili-specific measures based on the e-HInGiriSoko database (2023) and farmer interviews:

- Small scale irrigation can be useful but the effectiveness depends on the quality of irrigation facilities and availability of water
- Terraces and contour lines are an effective means to combat erosion and landslides. These can be combined with strategic holes dug to prevent water runoff, reducing the likelihood of landslides.
- Early maturing varieties (reduced production risk)
- Agroforestry (The farmer may benefit this kind of intercropping and be able to find firewood and forage for animals as well as soil protection hence more yield of fruits and vegetable)
- Soil fertility management is particularly relevant for chili cultivation and represents the most important factor determining the success of the crop. Good management practices include accurate application of soil fertilizers and amendments. Soil erosion and soil loss can be mitigated with the following measures:
- Mulching: stimulates microbial activity in soil through improvement of soil agro-physical properties. It also minimizes the use of Nitrogen fertilizer improves the soil physical condition, and suppresses weed growth contributing to increased yield. Use mulching (green leaf manure), compost, vermicomposting, and neem cake to enrich the soil with nutrients.
- Crop rotation: Within an intercropping system use crop rotations in order to boost soil microbial biodiversity and productivity. Follow a crop rotation plan of at least four years on the same plot. The main crop shall change every year. In case of multi-annual chili cultivation, keep three different main crops after Chili on the same plot before you cultivate chili next time.

- **Intercropping:** Intercropping is the cultivation of two or more crops simultaneously on the same field. It also means the growing of two or more crops on the same field with the planting of the second crop after the first one has completed its development. Intercropping with chili is possible with garlic, onions, or legumes (in particular, French beans).
- **Flood management** involves the strategic planting of bamboo along ridges. This practice is designed to mitigate the impact of flooding, contributing to a more resilient and sustainable approach to environmental risk management.
- **Pest and Diseases:** The community adopts Integrated Pest Management (IPM) strategies. Additionally, biopesticides are applied through targeted spraying, promoting a balanced and environmentally friendly method of pest and disease control.

**Based on this analysis, the climate change impact (adaptation and mitigation) and other environmental benefits for chili is scored a 3.**

### 5.3. Policy Analysis and Recommendations

As mentioned in 2.1.4, the following overarching policies guide the development of the chili sector in Rwanda:

#### **The National Strategy for Transformation (NST1) (2017–2024)**

**The National Agriculture Policy (NAP) (2017)** promotes the development of the agri-food economy, emphasizing the role of the private sector, and promoting inclusiveness and better participation of women and youth in agriculture programs.

**The Strategic plan for agriculture transformation (PSTA 4) (2018–2024)**, which implements the NAP

**The Gender and Youth Mainstreaming in Agriculture Strategy (2019–2026)** aims to enhance the youth and women inclusiveness of the PSTA4 actions and investments.

**The NAEB Strategic plan 2019-2024** focusses on increasing agri-export revenues.

Within the PSTA 4, the Government emphasized the role of the private sector in transitioning Rwandan agriculture from subsistence to competitive and market led. PSTA4 set targets for private sector contribution towards irrigation, market linkages (including infrastructure, post-harvest handling, and inputs), soil protection, and skills development,

as well as towards poverty reduction initiatives among the rural poor, notably through the *Girinka* program.

Within each District in the study area there are District level plans that include infrastructure improvements, training and capacity building, and other initiatives, however these plans are not specific to the chili sector and do not set specific targets related to chili production. An overview of the relevant targets is provided in Table 25.

**Table 25: District development strategy targets relevant for horticulture**

<b>District</b>	<b>Targets</b>	<b>Source</b>
Gakenke	Construction and rehabilitation of postharvest facilities (19) included 2 storages Construction of irrigation and drainage infrastructures Gaseke Marshland(182ha) Small scale irrigation on 688 ha	Gakenke District Development Strategy 2018/2024
Huye	Develop 300 ha of land installed with small and largescale hillside irrigation Develop 668 hectares of marshlands with modern irrigation Develop 200 hectares of radical terraces, and rehabilitate 175 as well as 4,922 hectares of progressive terraces	Huye District Development Strategy 2018/2024
Kayanza	Construction of 12 storage and drying facilities Construction of Large Scale Irrigation on 7000 Ha Marshland development on 3000 Ha	Kayanza District Development Strategy 2017/2024
Kirehe	300 Ha rehabilitated and extended for irrigation project funded by GFI. 92 ha of marshland developed 9 drying and storage facilities	Kirehe District Development Strategy 2017/2024
Nyabihu	600 ha of small-scale irrigation and water infrastructures (water harvesting) developed 1,068 ha of radical terraces 6,000 ha of progressive terraces	Nyabihu District Development Strategy 2017/2024
Nyamagabe	1,000 hectares of medium-large scale irrigation 350 ha of small-scale irrigation 760 ha of marshland developed	Nyamagabe District Development Strategy 2017/2024
Rubavu	Construction of modern markets in Gisenyi and Mahoko sectors	Rubavu District Development Strategy 2018/2024

District	Targets	Source
Rulindo	1,320 ha irrigated schemes developed 24 training sessions on irrigation management and systems	Rulindo District Development Strategy 2018/2024
Rwamagana	17 post-harvest facilities for drying and storage 350 hectares of marshlands rehabilitated 1,500 ha small scale irrigation developed 20 ha radical terraces 11,000 ha progressive terraces	Rwamagana District Development Strategy 2018/2024

Source: As listed

These policies, the chili sector is indirectly influenced by input policies governing the import of agrochemicals, and the Rwandan policy on fertilizer subsidization or pesticides.<sup>65</sup> Initiatives to harmonize regulations across the East African Community can influence the availability of fertilizer and pesticides.

While there is not a distinct policy for chili sector development, there is a strong regulatory environment supporting the development of agriculture in general, with extension services, financial support through subsidies as well as district plans to improve infrastructure. NAEB also provides support for companies looking to enter the export market. The analysis did not uncover any major gaps in the policy environment, the gaps mainly arise in the form of the implementation of the policies (for example extension services – discussed in 2.1.4 and 5.1.1.2).

**Based on the above analysis the score for institutional support for chili is 4.**

## 5.4. Framework to implement the intervention

**Efforts are imperative to enhance employment opportunities for women within Rwanda's chili value chain.** Notably, female participation in roles related to storage, market exploration, and service provision within the chili value chain remains inadequate. A contributing factor to this issue is the limited availability of storage and distribution facilities in Rwanda. Therefore, it is essential for the government to establish standards and regulations aimed at expanding storage and distribution capacities within the country.

<sup>65</sup> E.g. Ministerial order 3 of 2021 Determining the List of Chemicals and other polluting Substances that are not permitted: <https://commons.laws.africa/akn/rw/act/mo/minister-of-environment/2021/3/eng@2021-02-10.pdf>

Such an expansion would significantly contribute to mitigating post-harvest losses. Additionally, targeted capacity-building initiatives must be implemented to ensure the meaningful inclusion of women in employment within these facilities.

In order to address environmental concerns associated with the chili value chain, interventions must be implemented to deploy climate mitigation and adaptation strategies. These strategies encompass:

**Incorporating Post-Harvest Management as a Core Activity:** Recognizing the significance of post-harvest management, it is imperative to integrate it as a central activity within the chili value chain. This involves implementing practices and technologies that effectively reduce post-harvest losses and enhance the overall efficiency of the chili production process.

**Enhancing Climate Mitigation and Adaptation Technologies:** Implementing climate mitigation and adaptation strategies is crucial for the sustainability of the chili value chain. This involves investing in technologies such as **irrigation, soil health conservation, and integrated pest management to minimize environmental risks. Other important interventions include post-harvest techniques such as training on the use of maturity indices.**

**Capacity Building and Training for Technology Implementation:** To ensure the effective implementation of climate mitigation and adaptation technologies, comprehensive capacity-building programs and training initiatives should be provided to all stakeholders involved in the chili value chain. This would empower them to adeptly utilize technological advancements for environmental resilience.

**Establishing Financial Schemes for Climate Risks:** To safeguard against climate risks, particularly within varying scales of chili production, it is essential to establish robust financial mechanisms. This may involve the provision of insurance tailored to address climate-related challenges, thereby fostering resilience and sustainability in chili production. See section 10.1.6 for more details on the agricultural insurance landscape in Rwanda.

In conclusion, a multifaceted approach encompassing post-harvest management, small-scale infrastructure improvements, and strategic interventions for climate mitigation and adaptation is crucial to augmenting the role of women in Rwanda's chili value chain and ensuring its overall sustainability.

In the long term chili development must target increased professionalization in the domestic processing industry and expansion of the export markets.

## 6. Market systems analysis: Tomato

### 6.1. Market mapping

**Tomato production in Rwanda primarily involves smallholders, with some commercial farms using greenhouses.** The tomato value chain encompasses various forms of aggregation, allowing tomatoes to reach whole-sale and retail markets. However, the volume of tomato processing and exports remains relatively low. Up until very recently, imports of both fresh tomatoes and tomato paste exceed exports (see Figure 16). Fresh tomato imports primarily come from Uganda, with smaller amounts from the United Republic of Tanzania, Burundi, and Kenya. In contrast, fresh tomato exports are primarily destined for the Democratic Republic of Congo (DRC). Processed tomato products like ketchup and sauces are consumed domestically and exported to neighboring countries. While import-export volumes represent a small fraction of the national production, fresh tomato imports seem to be more substantial. Tomato paste mainly originates from Italy and China and is used by some local processors (Van Keulen et al., 2022).

**There appear to be significant differences in tomato production at the district level.**

There is no district-specific data available on tomato production from official government sources, however a recent paper by Van Keulen et al (2022) contains district level production estimates based on FAOSTAT data. These statistics show that there is strong variability by district and that tomato production is concentrated in the Eastern province which accounts for over 70 percent of production. Rwamagana is particularly important for tomato production as shown in Table 26.

**Table 26: Average production by District of 2017, 2018 and 2019**

Province	District	Tomato (average tons per annum)
Northern	Rulindo	2,561
Northern	Gakenke	1,005
Western	Nyabihu	1,379
Western	Rubavu	-
Eastern	Kayanza	4,103
Eastern	Rwamagana	12,756
Eastern	Ngoma	1,930
Eastern	Kirehe	735
Southern	Nyamagabe	104
Southern	Huye	3,016

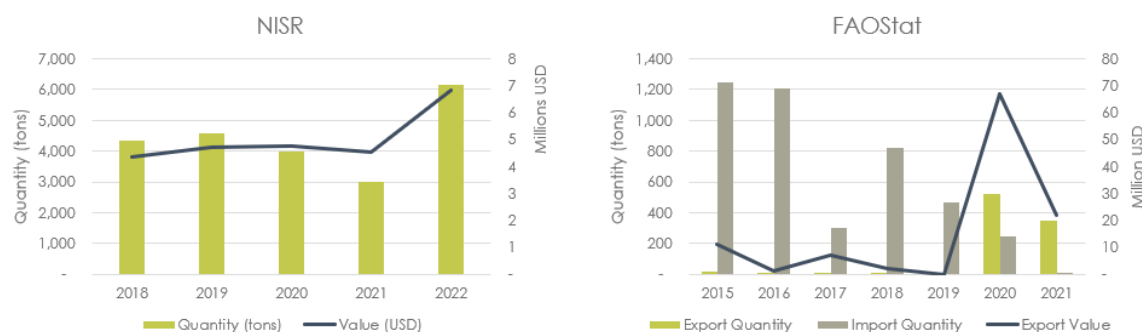
Source: Van Keulen et al. (2022)

**Farmers consistently reported that tomato is an attractive crop due to its dual food security and income benefits, the short growth cycle, and generally good prices.** However, access to irrigation facilities or low lying water is an important requirement. Post harvest losses are highlighted by many farmers as a major issue. However, tomato is seen as a stable income generating crop that can provide for basic financial needs, with a short growth cycle<sup>66</sup>.

**Tomato exports appear to have increased in recent years, although there is a mixed picture from available data.** FAOStat data show very low exports until recent years, while NISR data tell a different story of gradually increasing exports over time. Interestingly, as of 2018, Rwanda was a net importer of tomatoes, and in 2020, this shifted to Rwanda becoming a net exporter. The NISR data show much higher levels of exports, which is likely due to the inclusion of informal trade (NISR, 2022).<sup>67</sup> The FAOStat data show that, as of 2021, formal sector exports of tomatoes are not a well-established market sector, but rather that the market for formal exports is dynamic.

<sup>66</sup> Kay\_3 interview with tomato producer group 4.12.23

<sup>67</sup> For many commodities, NISR report formal and informal exports separately, however for peppers the figures are combined



**Figure 16: Tomato exports over time, comparison of NISR and FAOStat data**

Source: FAOStat<sup>68</sup>, NISR (2022)

**The majority of the tomatoes traded in Rubavu's cross-border market, originate from Rwanda's Eastern Province, including Rwamagana.** A group of approximately twelve tomato merchants transport the produce across the country using Daihatsu trucks with a capacity of five tonnes each. Prices vary on a daily basis according to the market needs. Cross-border traders show little interest in tomatoes sold in 15 to 20 kg basins due to their inconsistency in producing sauce, preferring instead those grown in the Eastern Province, which receive more sunlight exposure. **Rwanda has secured a dominant position, capturing about ninety percent of the tomato market in North and South Kivu, competing with supplies from South Kivu, particularly from Minova.** Similar to Rubavu's tomatoes, those from Minova are less favored by the mass market in Goma but are sold to affluent consumers who perceive them as organic, commanding a price approximately ten percent higher. Minova's tomatoes are transported to Goma twice a week via small boats (Ujenza 2019 in (Van Keulen et al., 2022)).

**Different tomato varieties are sown in Rwanda, however, variety does not seem to impact demand substantially in most regions.** While many tomato varieties are sold in Rwanda, superficial features such as size, firmness, and color are more important in determining demand (USAID, 2018c)<sup>69</sup>. In Rwamagana, field interviews suggest that varieties do play a role in the market. There, the dominant varieties are Roman, Sorwatom and Inyamutara, which are appreciated by buyers. There is also a difference in the growth cycle, with Roman and Sorwatom taking 3 months from plantation to harvest whereas Inyamutara takes 4 months.<sup>70</sup>

**Greenhouse production is limited in Rwanda,** with the majority of tomato cultivation occurring in open fields. The seasonality of open-field production, coupled with low

<sup>68</sup> <https://www.fao.org/faostat/en/#data/TCL>

<sup>69</sup> Of course, size, firmness and color contribute to shelf life and durability during transport

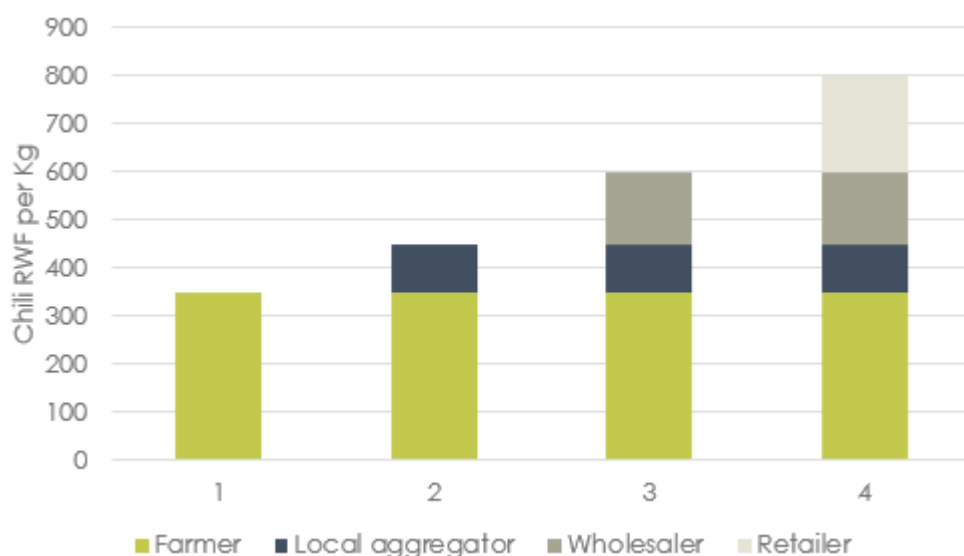
<sup>70</sup> Producer group interview Rwamagana, 7.12.23 Rwa\_4



intensification levels, results in supply and demand imbalances. Despite a history of relatively high failure rates for cooperative greenhouses in Rwanda, they could potentially offer a long-term solution to address industry challenges (USAID, 2018c). None of the interviewed farmers produce tomatoes in a greenhouse, as tomatoes are not seen as a premium crop that can command a high price on the market. It is estimated that there are between 100 to 150 greenhouses in Rwanda at present (Van Keulen et al., 2022), but there is strong skepticism among farmers. For example, even when provided by organizations like the Imbutu Foundation, the KUBINYA farmer cooperative, comprised of 40/45 women members, received greenhouse support three years ago, yet the greenhouse has not been fully utilized.<sup>71</sup>

## Pricing

**Unlike in the case of chili, a large proportion of the final retail price is captured at the producer level.** Figure 17 shows the price build up at various stages of the value chain when supplying the domestic markets. Given that such a high proportion of the value added is captured at the smallholder level, this indicates that for tomato, the focus of the SERVE project should potentially be on initiatives focusing on production.



**Figure 17: Value added for domestic consumption**

Source: Van Keulen et al. (2022)

Given the low export potential of tomatoes, and the very high seasonality of tomato production, it is difficult to see a way for tomato processing on an industrial scale to become successful in Rwanda. For example, the Sorwatom tomato company failed

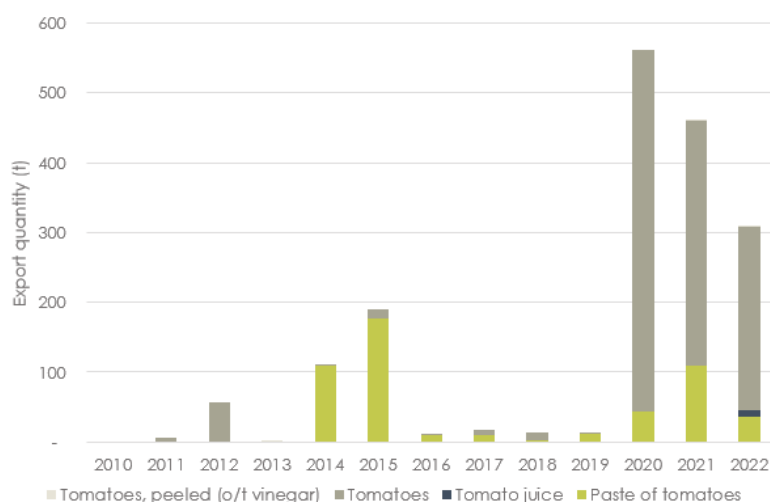
<sup>71</sup> Kir\_13 4.12.23

financially in 2011 and switched to sourcing tomato paste from imports, after trying to source its supply of tomatoes locally (Van Keulen et al., 2022).

There are successful ongoing operations though. In Rulindo district, the Sina Gerard, or Urwibutso Enterprise, is a particularly impressive business employing 1400 staff, including 600 permanent workers and 800 casual workers. Around 70 percent of the staff are youth, and 60 percent are women. Urwibutso Enterprise produce ketchup for domestic consumption and there is healthy demand at the national level. The major issue for Urwibutso is to source supply of quality tomatoes, which they often source from Nyagatare district and other regions.

There is a healthy informal sector cross border trade with the Democratic Republic of Congo and local demand is high all year round, with prices being relatively stable (Van Keulen et al., 2022).

There is no publicly available information on domestic sales of processed tomato products, but the export figures give some indication. Figure 18 shows that there is low level, sporadic demand for tomato paste and tomato juice, but exports of whole tomatoes dominate the market.



**Figure 18: Export of processed tomato products over time**

Source: FAOStat<sup>72</sup>

**Based on the above analysis, the score for market potential is 7.**

<sup>72</sup> <https://www.fao.org/faostat/en/#data/TCL>

### 6.1.1. Tomato Value chain

The tomato value chain can be simplified into four main stages: input supply, production, wholesale, and aggregation (including processing) and retail. The basic outline can be seen in Figure 19. As discussed above, formal sector exports of tomatoes are limited.

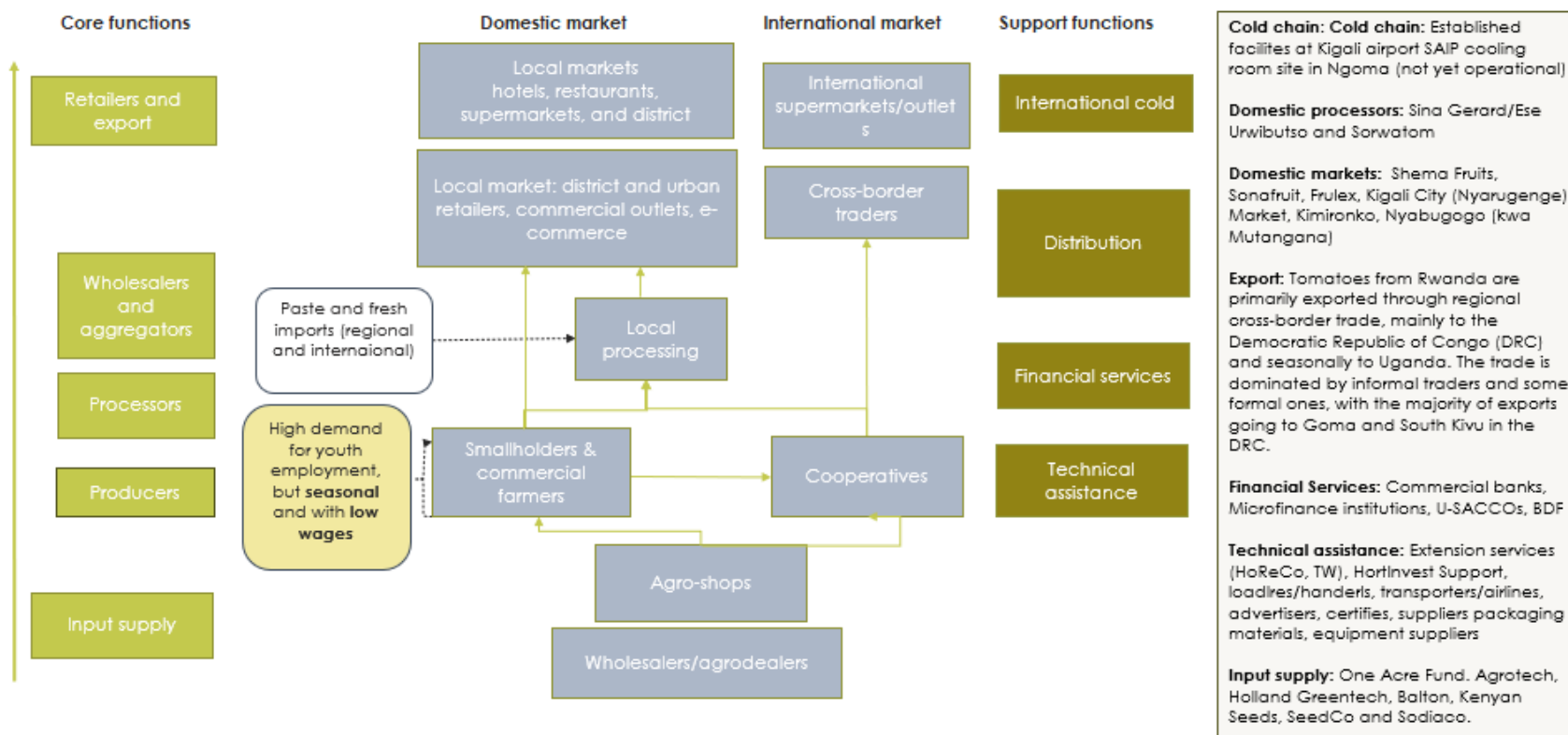


Figure 19: Simplified tomato value chain schematic

Source: Field interviews, USAID (2018c), Van Keulen et al. (2022)

**As a widespread crop with multiple food security and economic benefits, tomato offers employment possibilities for women and youth across all nodes of the value chain.** The following sections describe the headline findings across each node of the value chain for tomato.

## Supporting Services

Farmers require capacity building across the entire tomato value chain to enhance skills related to increasing production through improved input efficiency, effective pest and diseases control, and management of post-harvest handling. Additionally, training is needed in accessing market information, implementing marketing strategies, and obtaining certifications to elevate the overall quality of the tomato value chain.

**Service providers:** While there is, in principle, high demand for agricultural extension officers and agronomists among smallholder farmers, there is less capacity to self-fund such trainings and there are limited funds and places available within funded programs. Further opportunities exist in the areas of logistics, marketing, and export consulting. However, there are a large number of successful training organizations and youth focused agribusiness organizations in Rwanda<sup>73</sup>. One of the most prominent, the Rwanda Youth in Agribusiness Forum (RYAF), offer training programs with young agri-preneurs, by placing them with established companies to experience learning with a practical skills focus. RYAF stated that they have a gender policy in place and that 55 percent of applicants to their programs are female. Currently the Rural Youth Employment Support (R-YES) Project is one of the major initiatives of RYAF.

**Agriculture Extension Services Enhancement:** Despite government efforts through TWIGIRE Muhinzi, there remains a gap in agriculture extension services. The model, featuring farmer promoters and farmer field schools, exemplifies the potential to improve farmer skills, knowledge, and empowerment. To bridge this gap further, there is a need to expand and optimize the Customized Agriculture Extension Services (CAES), particularly to incorporate the private sector. This expansion would create opportunities for youth and women to actively participate and contribute to agriculture extension services.

**Incorporating Private Sector in Agriculture Extension:** Operationalizing CAES to include the private sector in agriculture extension services is essential. This expansion opens

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<sup>73</sup> Harambee Youth Employment Accelerator, Horticulture in Reality Cooperative (HoReCo) AgriWin Ltd, Young Professionals for Agricultural Development (YPARD) Rwanda, Youth Connekt national programme, Youth Ecobrigade programme, Youth Engagement in Agriculture Network (YEAN), Knowledge Lab (K-Lab)

avenues for collaboration with youth and women, allowing them to actively participate and contribute to the dissemination of agricultural knowledge, skills, and technologies.

### **6.1.2. Value Chain Nodes**

The following sections outline the main issues raised and opportunities identified at each stage of the tomato value chain.

#### **6.1.2.1. Input supply**

##### **Explanation of node**

**Input supply level:** Opportunities at this level are similar across the horticultural value chains, because the supply of inputs through agrodealers and agroshops caters to multiple products. At the input level there are opportunities through nurseries and agrodealers, however there are established businesses offering these services and paid positions are relatively few. In many districts, input supply is mainly provided by One Acre Fund (Tubura).<sup>74</sup> Van Keulen et al (2022) also found that there are opportunities for educated youth in agripreneurship to start small agro shops and work in existing agro-wholesalers and agro shops. However, there are a limited number of such positions available. Field interviews noted that women are highly suited to nursery activities.

#### **6.1.2.2. Production**

##### **Explanation of node**

**Production level:** Women actively engage in various aspects of tomato production, including land preparation, hole digging, weeding, and mulch collection. The decision-making process regarding tomato production and the associated income is influenced by the female and youth empowerment linked to project ownership. Female youth find activities like land preparation, planting, weeding, and harvesting more suitable compared to tasks such as pesticide application, which are typically handled by men. When a female youth assumes ownership of the tomato farming project, all production activities are aptly and efficiently performed. However, when project ownership is shared

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<sup>74</sup>Huy\_3

between a wife and husband, the scope of activities undertaken by women is restricted to tasks like weeding, limiting their skill development opportunities.

**Harvest and post-harvest management:** The absence of collection centers in the market structure poses a constraint for smallholder farmers.<sup>75</sup> Harvest techniques often lead to increased post harvest loss and these can be improved significantly through training in correct measures (see Box 5).

**Transport:** Smallholder farmers use very rudimentary means to transport tomatoes to market – usually bicycles and baskets (transportation is typically done by male youth). Farmers sell tomatoes to the local markets and restaurants and bars.

### **Skills barriers and gaps**

**Input Use Efficiency Expertise:** Capacitating farmers with knowledge and skills related to input use efficiency is crucial for optimizing production. Training programs should focus on efficient utilization of agricultural inputs to improve yields and overall farm productivity.

**Pest and Disease Control:** Comprehensive training is required to enhance farmers' abilities in controlling and managing pests and diseases effectively. Skill development programs should cover sustainable and integrated pest management practices, reducing reliance on harmful pesticides and ensuring environmental sustainability.

**Advanced Post-Harvest Handling Techniques:** Building expertise in advanced post-harvest handling techniques is essential to minimize losses and maintain the quality of harvested tomatoes. Training programs should emphasize modern methods and technologies to enhance post-harvest handling efficiency.

### **6.1.2.3. Processing**

**Processing:** The only processor that was identified in the study was Sina Gerard in Rulindo, who produces ketchup for national demand. Industrial quantity demands are high, and quality requirements are usually high as well. Sina Gerard employs a limited number of workers within the processing node, including 600 full time staff and 800 casual staff. The breakdown of workers by activity was not provided, however it is clear that the company provides on the job training.

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<sup>75</sup> Kir\_13 tomato producer group interview 4.12.23

**Cold storage:** No field interviews reported the use of cold storage for tomatoes.

#### 6.1.2.4. Wholesale/Retail

##### Explanation of node

Wholesale within the tomato value chain includes large trades who hire trucks to facilitate the collection and transport of tomatoes for major markets as well as large scale commercial farmers who collect their own production and that of other farmers to bring to markets. The total number of wholesalers varies with the season but can reach up to 30 farmers per day (Van Keulen et al., 2022). Wholesalers report very high rates of lost production (up to 40%). The major wholesale market is in Kigali at the Nyabugogo wholesale market.

**Market Access Strategies Training:** Farmers need to be equipped with strategies for accessing markets efficiently. Training programs should focus on market dynamics, information dissemination, and the development of effective marketing strategies to connect farmers with broader markets including wholesalers and regional markets where appropriate.

**Market Exploration:** Evidence from interviews indicates that marketing and sales are traditionally done by men in general in Rwanda.<sup>76</sup> Many interviewees stressed the lack of price negotiating power on behalf of the sellers and this is seen as a structural issue (too few purchasers on the market).

##### Conformance to Market Requirements and Standards

**From the interviewed farmers, it would appear that quality standards in the tomato value chain are not a relevant consideration for the bulk of farmers.** Given the low levels of formal sector exports, there is also no incentive for farmers to pursue this. Further, given the very large scale of tomato production, there is less potential for farmers to extract a price premium for tomatoes that are produced using quality standards of certification.

Only Urwibutso Enterprise provided feedback regarding standards, stating that they adhere to rigorous standards particularly regarding health protection, and they see that customers have a high degree of trust for their products, however on the demand side,

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<sup>76</sup> The study did not determine any breakdown of male and female employment for chili specifically, at this node of the value chain.

foreigner consumers are aware and check if the product are standardized but these are less important generally for Rwandan consumers. For this high-level processor and retailing operation, the requirements start from field, evaluating cultivation and pesticide and fertilizers application, through to harvesting techniques, transportation, and processing. There is also product testing at the facilities in Rulindo, evaluating the quantity of sugar, quantity of salt and other ingredients at appropriate measure. While Urwibutso is an incredible achievement, it remains a strong outlier in terms of the professionalism of production and processing in the Rwanda agricultural landscape. Sina Gerard is a clear lead firm in terms of food safety, professionalism and also diversification of activities.

#### 6.1.2.5. Challenges and constraints at production

An overview of the challenges and constraints within the tomato value chain is presented in Table 27.

**Table 27: Overview of challenges in tomato production for youth and women**

Challenge	Description
Land Availability Challenges	Insufficient access to land for cultivation, especially for youth who face difficulty in obtaining land. Preference for producing on household land creates competition between youth and parents. High cost of renting land, for instance, 5 acres priced at 50,000Rwf per season
Climate Information Accessibility:	Limited access to climate information poses a constraint for farmers in making informed production choices.
Disease and Pesticide Challenges:	Disease outbreaks during the rainy season result in increased pesticide usage. High costs associated with purchasing pesticides to address tomato-related diseases.
Fertilizer Accessibility Issues:	Lack of access to fertilizers poses a challenge for youth in agriculture.
Financial Services Barriers:	Challenges in accessing financial services due to the requirement for collateral, particularly impacting youth and young females.
Post Harvest Losses:	Absence of cold rooms contributes to post-harvest losses, given the short shelf life of tomatoes. Limited techniques for adding value to tomatoes, affecting long-term conservation.
Irrigation Equipment Constraints:	Limited access to irrigation equipment, particularly for youth and young females not on marshland.



Challenge	Description
	Inability to produce during drought seasons due to the lack of irrigation resources.
Awareness and Collaboration Challenges:	Lack of awareness and collaboration among youth for effective teamwork and increased production.
Technical Skills Deficiency	Insufficient technical skills in farming among youth and women, hindering optimal production.

Source: Producer group interview 16.11.23 RuL\_5

Similar to other horticulture crops, tomato is a highly perishable crop, particularly vulnerable to heat. High temperatures (in absence of cooling systems) can lead to a shelf life of 1-3 days instead of 1-3 weeks under ideal temperature conditions. With increasing number of hot days, this represents a risk for this value chain (The World Bank, 2020). Rising temperatures increase the risk of pest and diseases outbreaks, requiring active pest management intervention. Other general mitigation measures applying to the tomato value chain are illustrated in Chapter 3.1.3.

**Based on the above analysis the score for gender and youth participation, potential, and impact participation for tomato is 8.**

## 6.2. Risk and Vulnerability Analysis

The current climate suitability of tomato is highest in the western parts of Rwanda (Figure 20). These are the areas with the highest altitude in Rwanda and includes districts that are outside the project areas. Projected climate changes arguably show more of Rwanda becoming suitable to tomato production (Mwongera et al., 2019). While the areas best suited for tomato lie outside the project areas, there is still strong evidence of tomato production in the project districts as shown in Table 26 in Rwamagana, Rulindo and Kayanza in particular.

In general, tomatoes grow best in well-drained soils, as they are very susceptible to waterlogging. The optimum soil pH for their growth is between 6 and 7. Maintaining a temperature range of 20-27 °C is ideal for optimal development. However, fruit production tends to decrease when temperatures exceed 30 °C or drop below 10 °C (e-Hinga, 2023).

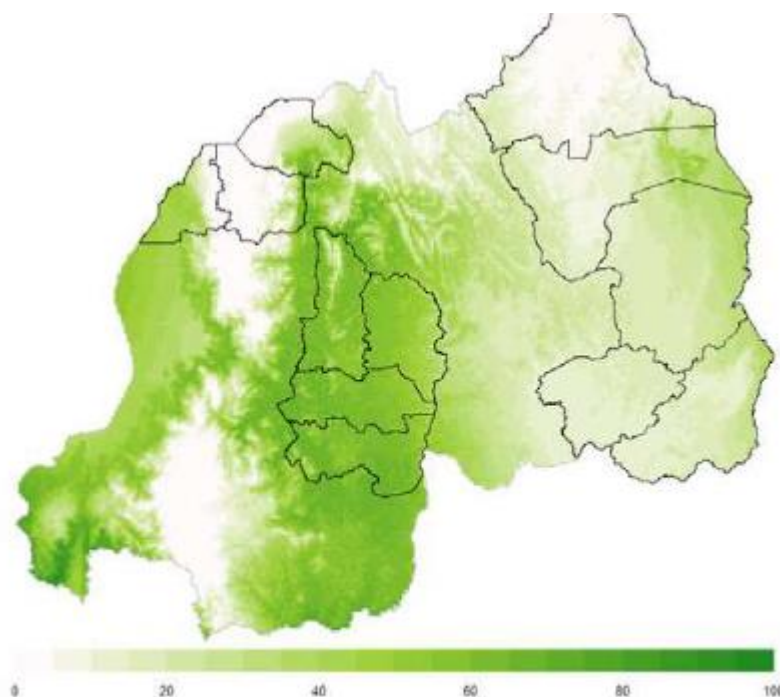


Figure 24: Current climate suitability for tomato in Rwanda

Figure 20: Current climate suitability for tomato in Rwanda (1981 – 2015) on a 1-100 percent scale

Source: Mwongera et al. (2019)

### 6.2.1. Ecological suitability and environmental risks

Table 28 details the perceived suitability and environmental risks for tomato at the district level as reported from key informant interviews.

Table 28: Major risks for tomato production at district level\*

District	Suitability	Major risks and current management	Source
Ngoma	Ngoma district land is suitable for tomatoes given the prevalence of low lands.	<p>The primary environmental risks are drought and diseases. Management primarily involves the application of pesticides and irrigation in case of drought.</p> <p>Farmers currently lack irrigation facilities, with the exception of one non-operational cold room located at the irrigation site, Ngoma 22.</p> <p>Production significantly decreases when encountering unknown diseases or pests. Farmers need advanced access to on-farm agro dealership services like farm services centers and self-assessments related to pest and disease control.</p>	Ngo_7

District	Suitability	Major risks and current management	Source
		<p>Regarding irrigation facilities, farmers need support, whether in terms of cost sharing or subsidized programs.</p> <p>Tomato farmers in the Ngoma district require improved irrigation facilities, such as motor pumps, dam sheets, and constructed irrigation channels.</p> <p>Agricultural activities including terracing, irrigation, ditches, and mulching are essential. While the cost for irrigation is unknown, the cost for ditches ranges between 400,000 RwF and 500,000 RwF.</p> <p>Due to unfamiliarity with pests and diseases related to climate change, farmers require advanced and continuous training in pest and disease control. Some existing pesticides may not be effective due to resistance or the emergence of new pests brought on by climate change.</p> <p>Farmers practice mulching for water conservation, although this may have unintended mitigation measures against climate change, reducing greenhouse gas emissions from soil organic matter degradation.</p>	
Kirehe	<p>Suitable land for tomatoes is close to a water source for irrigation and with well drained fertile soil.</p> <p>All sectors of Kirehe have suitable land for tomatoes.</p>	<p>The primary environmental risk faced by farmers in the area is flooding from the Akagera River. Even though a 50m buffer zone around the river is observed by farmers, floods often surpass this zone, causing extensive damage to crops. Additionally, periods of unexpected rainfall or sunshine can lead to drought conditions, further exacerbating the situation.</p> <p>In instances where the amount of rain or sunlight deviates from expectations, new pests and diseases emerge that are not controlled by the currently available pesticides. These environmental risks are managed through a variety of strategies. These include maintaining a 50m buffer zone from the Akagera River during irrigation, diversifying the types of pesticides used, implementing erosion control measures through the use of radical and progressive terraces, and ensuring proper drainage.</p> <p>Despite these measures, floods that exceed the buffer zone remain a challenge. Farmers have expressed a need for further exploration and</p>	Kir_13

District	Suitability	Major risks and current management	Source
		management strategies to handle such situations	
Rwamagana	Marshland and lowlands are best suited, (with access to water for irrigation).	<p>Production decreases significantly when unknown diseases or pests occur, emphasizing the need for advanced access to on-farm agro dealership services like farm services centers. Farmers also need to conduct self-assessments regarding pest and disease control.</p> <p>Current irrigation facilities are lacking, and farmers solely rely on traditional manual irrigation systems.</p> <p>The main environmental risks are drought and diseases. Irrigation practices are used to mitigate drought, while bio pesticides are used to manage diseases.</p>	Rwa_4
Rulindo	Tomato profitability is subject to climate issues; during a rain period, the tomatoes commodity has many risks of diseases which require many pesticides and during dry season, tomatoes get dry.	<p>Profitable venture under favorable climatic conditions.</p> <p>Climatic challenges, such as excessive rainfall, pose risks of diseases, necessitating increased pesticide use.</p> <p>Dry seasons can lead to dehydration of tomatoes, affecting yield and profitability.</p>	Rul_5
Kayanza	<p>Tomato plants thrive in well-drained areas with ample sunlight.</p> <p>Soil pH ranges from 6.2 to 6.8, and the soil is generally fertile, but may result in vigorous foliage with limited fruit production.</p> <p>Suitable lands for tomatoes include marshland and lowlands with access to water for irrigation if required.</p>	<p>The primary environmental risks faced by farmers include drought, heavy rainfall leading to soil erosion, and pests and diseases.</p> <p>Management of these risks primarily revolves around irrigation and the application of pesticides.</p> <p>Currently, farmers lack facilities for irrigation and rely solely on traditional manual methods. This involves filling bottles with water and applying it across the entire field.</p> <p>To mitigate environmental risks, farmers use Dithane, Safarimax, and Lidomir.<sup>77</sup> They also adopt a unique planting method of surrounding their tomato fields with maize.</p> <p>For climate change mitigation, farmers employ agroforestry, integrating trees within their tomato farms.</p>	Kay_3
Nyamagabe	The land is very suitable	The primary environmental risks include pests and diseases such as Tuta Absoluta, Early and Late Blight, and Mildew, which can cause	Nyam_2

<sup>77</sup> Fungicide, herbicide and pesticide

District	Suitability	Major risks and current management	Source
		<p>significant losses due to the high cost of insecticides and pesticides.</p> <p>Risks associated with soil erosion, flooding, and landslides that can disrupt the growing of tomatoes and uproot them. To mitigate these risks, terracing and planting agroforestry trees are employed.</p> <p>Climate change, characterized by excessive rainfall that can destroy tomato crops, is another risk. This risk can be managed through efforts to reduce greenhouse gas emissions (mitigation) and increasing societal capacity to adapt to climate changes (adaptation).</p> <p>Drought poses a risk to farming, necessitating the use of irrigation to sustain farming activities.</p>	

Source: As indicated, \*Districts not covered specifically for tomato production: Gakenke, Nyamagabe, Rubavu

### 6.2.2. Mitigation measures

In the region of Kayonza, despite the construction of numerous irrigation sites by the Land Husbandry, Water Harvesting and Hillside Irrigation Project (LWH) and the Rwanda Rural Sector Support Project (RRSSP)<sup>78</sup>, farmers continue to rely on traditional manual irrigation methods. The introduction of modern irrigation systems, such as motor pumps, dam sheets, and constructed irrigation channels, would prove to be more efficient.

However, farmers face challenges with unfamiliar pests and diseases linked to climate change and drought. They require continuous and advanced training in pest and disease control, as current pesticides may not be effective due to resistance or the emergence of new pests. Furthermore, farmers need support in the form of subsidies for irrigation facilities.

Another aspect of farming that farmers engage in is mulching, a practice aimed at conserving water. However, this measure may not effectively mitigate climate change as it could lead to soil organic matter degradation, resulting in increased greenhouse gas emissions. To combat soil erosion, farmers create progressive terraces.

<sup>78</sup> Both funded by the World Bank

## Box 5: Factors and mitigation methods for post harvest loss in tomato production

Enhancing how tomatoes are handled after harvest is crucial for boosting the amount of tomatoes available for sale, as it improves both the quantity and quality. Field assessments, using the Commodity Systems Assessment method, indicate that farmers lose around 21 percent of their crop during harvest. Additionally, at the collection point, 11.5 percent of tomatoes are lost, 10 percent are culled at the wholesale level, and 13.6 percent are discarded at the retail level.

**Input Challenges:** Limited availability of quality and affordable seeds in the market forces farmers to resort to regenerated seeds, often up to the 3rd generation. This practice significantly reduces seed productivity and leaves crops more susceptible to pests and diseases.

**Harvest and post harvest management:** Tomatoes are harvested when red ripe and soft, offering minimal remaining shelf life. Multiple packing and repacking processes diminish the quality of tomatoes at the farm level.

**Proper Storage Limitations:** Proper storage after harvest at the farm poses a significant challenge in postharvest management.

**Shelf Life and Postharvest Losses:** The lead time from farm-level harvest to the customer is approximately one day, allowing only 2 to 3 days of shelf life. Delays in transportation lead to additional postharvest losses.

**Transportation Challenges:** Tomatoes are often packed and transported in large baskets, contributing to losses along the supply chain. Trucks are frequently overloaded for the long-distance transportation of produce, exacerbating challenges in the tomato supply chain.

**Cold Storage:** There are no cold chains or cool storage facilities for tomatoes.

### **Solutions**

**Training on post harvest management:** Farmers need training in harvest indices, postharvest handling, container use, sorting/grading, and shade application. The focus is on comprehensive best practices for production, harvest, and postharvest process:

- Use of shade, and improved containers for transport and marketing
- Cool Chamber (brick and sand, 100 kg capacity) for temporary cool storage

- Small-scale tomato processing methods (solar drying, sauce making, juices)

**Postharvest agribusiness:** Support entrepreneurs in providing postharvest storage and management services, including packaging and transportation. Encourage local manufacture of tomato products tailored to consumer preferences. Provide smallholders with training on farming as a business.

Source: USAID (2018c), Van Keulen et al. (2022)

**Measures to reduce post-harvest loss can include improved harvesting practices.** By utilizing a color chart and harvesting when the fruits are at the turning stage, with firm ones that will ripen to red within 3 or 4 days, it results in a direct profit boost of \$208 for every 1000 kg load, while minimizing mechanical injury during transportation to the market (USAID, 2018c).

**Table 29. Use of maturity indices for tomato harvesting**

Start with 1000 kg	Current practice	New practice
Harvest practice	Harvest at light-red to full red ripe, soft fruits	Harvest at turning stage, firm fruits, turning to red within 3 or 4 days
Cost		
Color charts for training on maturity indices		7680 Rwf
Benefits		+ 15360 Rwf (\$US12)
percent Loss	30 percent	10 percent
Relative profit		+ \$208 for each ton of tomato

Source: USAID (2018c) – prices adjusted to 2024

The second example involves using shade to protect tomato during delays or marketing. This simple and affordable technology reduces pulp temperature by 10 to 15°C. The initial cost pays off after 5 uses, and each subsequent use adds \$12 per 100kg load.

**Table 30: Use of shade for harvested tomato**

Start with 1000 kg	Current practice	New practice
	Leaving piles of tomatoes in direct sun	Use of shade to provide lower temperature for produce during delays, transport or marketing
Simple portable shade structure		\$USD61
percent Loss	30 percent	10 percent

Start with 1000 kg	Current practice	New practice
Total revenue for 100 kg (\$0.75 p kg))	\$42	\$55
Relative profit		\$12 per 100 kg

Source: USAID (2018c) – prices adjusted to 2024

**Based on this analysis, the climate change impact (adaptation and mitigation) and other environmental benefits for tomato is scored a 3.**

### 6.3. Policy Analysis and Recommendations

At the time of writing, tomatoes are not covered under NAIS, despite it being a profitable crop with a strong domestic market. However, the number of value chains covered under the NAIS keeps on increasing gradually and it may be that tomatoes are covered soon.<sup>79</sup> Tomatoes also tend not to be covered under land use consolidation initiatives, as these policies tend to focus on major crops such as maize, potatoes, or beans.<sup>80</sup>

The Small Scale Irrigation Technology (SSIT) program in Rwanda does cover tomato production, however at present the majority of tomato production systems are rain fed.

For a list of District level initiatives contained in the district development plans see Table 25, however note that these are not directly related to tomato production.

**Based on the above analysis the score for institutional support for tomato is 2.**

### 6.4. Framework to implement the intervention

Based on the analysis of information from the field and literature review, the following represent the key points to consider for an effective strategy framework to improve tomato production and post-harvest handling in Rwanda:

**Improved Harvesting Techniques:** Training farmers on better harvesting practices can significantly reduce post-harvest losses. Using a color chart to determine when

<sup>79</sup> Acre Africa interview 7.11.23 Kig\_15

<sup>80</sup> Kir\_13 tomato producer group 4.12.23



tomatoes are ready for harvest can lead to a direct profit boost of \$170 for every 1000 kg load, while minimizing mechanical injury during transportation to the market.

**Post-Harvest Management Training:** Farmers need training in harvest indices, post-harvest handling, container use, sorting/grading, and shade application. This focus should be on comprehensive best practices for production, harvest, and post-harvest processes.

**Support for Post-Harvest Agribusiness:** Encouraging entrepreneurs to provide post-harvest storage and management services, including packaging and transportation. Also, promoting local manufacture of tomato products tailored to consumer preferences and providing smallholders with training on farming as a business.

**Addressing Infrastructure Deficiencies:** The absence of essential infrastructure, including roads and market buildings, complicates transportation and market accessibility for tomato farmers. Insufficient irrigation facilities during the dry season hinder consistent tomato production, affecting yields and overall crop health. A lack of post-harvest facilities, such as cold rooms or even shaded roadside storage, hinders proper storage and preservation of tomatoes, leading to post-harvest losses. SERVE can play a role in providing finance to farmers to construct these facilities and advocating with district officials to provide these facilities.

**Promoting Market and Climate Information Sharing:** Farmers face challenges due to a lack of timely and accurate market information, impacting decision-making and market access. Increased interventions are necessary to raise awareness and promote the adoption of contract farming, ultimately attracting more farmers to invest in tomato production.

**Policy Interventions:** At the time of writing, tomatoes are not covered under NAIS, despite it being a profitable crop with a strong domestic market. However, the number of value chains covered under the NAIS keeps on increasing gradually and it may be that tomatoes are covered soon. The Small Scale Irrigation Technology (SSIT) program in Rwanda does cover tomato production, however at present the majority of tomato production systems are rain fed.

These strategies can help improve the economic viability of tomato production in Rwanda, benefiting both farmers and consumers.

While there is not a particularly favorable outlook for tomato in terms of international trade indicators or commercialization of the tomato value chain, there is huge potential improving the **production and post-harvest handling** via relatively cheap methods including harvesting techniques and improved transportation facilities. The economic

analysis of the investment required for these interventions is very positive and the potential gains are large.

## 7. Market systems analysis: Green beans

### 7.1. Market Mapping

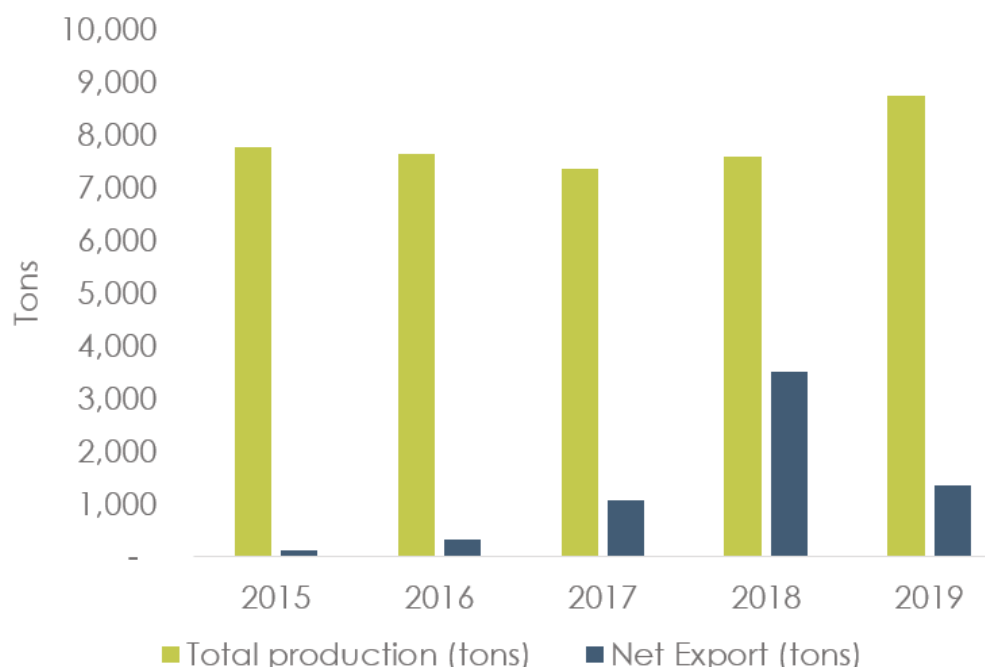
French green bean is important for food security, nutrition, and commercialization in Rwanda. Rwanda's NAEB's strategy prioritizes the growth of green bean exports to international markets (NAEB, 2018). Index box indicates that since 2008, green bean enjoyed a significant growth with an increase of 1,631 percent, and production reached a peak volume of 74k tons of production in 2018<sup>81</sup>. The production of green beans has been rising due to a year-round demand in destination markets (Europe, Middle East). According to the Joint EU-ILO Government of Rwanda project report (2019), green beans production increased by 20 percent between 2014 and 2016. Furthermore, export value was estimated at USD 50,500 per ha and generated jobs equivalent to 60.1 FTE, thus creating jobs up to 3.9 FTE per ha. Furthermore, green bean recorded up to 95 percent informal smallholder farmers' production, with production estimates between 65-80 percent (Ntawubizi et al., 2020). It is assumed that the majority of smallholder produce does not enter export markets but is geared towards supplying local and regional markets. However, commercial farms are 100 percent formal, registered, and regularly inspected by RAB and MINAGRI/RALIS for processing and export (MINAGRI, 2019).

Quality requirements for all sectors of the markets are a problem for green bean players. At the export level, the Rwanda Standards Board (RSB) controls the certification of hazard analysis critical control point (HACCP) in line with the law N° 16/2016 of 10/05/2016 on plant health protection in Rwanda.

Figure 18 indicates the huge gap between production and exports of green bean between 2015-2019 because most of the production in Rwanda is still consumed domestically. Green beans export is done through both formal and informal trade, with most of the volume going through formal traders and only a small portion occurs through informal trade. Regional markets are more important, taking more than 80 percent of the volume, with 70 percent to DRC and 30 percent to Uganda (Van Keulen et al., 2022).

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<sup>81</sup> [https://app.indexbox.io/report/070820/646/?\\_gl=1\\*1h6pw4u\\*\\_ga\\*NDk5ODIxNzE2LjE3MDI1NjE2MDY.\\*\\_ga\\_6KCVGEDSJE\\*MTcwMjU2MTYwNi4xLjEuMTcwMjU2MTc4OS4wLjAuMA](https://app.indexbox.io/report/070820/646/?_gl=1*1h6pw4u*_ga*NDk5ODIxNzE2LjE3MDI1NjE2MDY.*_ga_6KCVGEDSJE*MTcwMjU2MTYwNi4xLjEuMTcwMjU2MTc4OS4wLjAuMA)



**Figure 21. Production and export of French beans 2015–2019**

Source: Production data from FAO and export data from NAEB [online]. [Cited 20 February 2020]. [www.fao.org/faostat/en](http://www.fao.org/faostat/en).

In recent years Rwanda exports of green beans fluctuated substantially, but it tended to increase through 2002 - 2021 period<sup>82</sup>. From 2007 to 2015, Rwanda was a net exporter of green beans in physical and value terms. Information from National Agricultural Export Board (NAEB)<sup>83</sup> shows that the major outlet for green beans is the European Union market (France and the UK), regional markets (Markets: Burundi, DRC, and Uganda) and probable markets opened in UAE in the Middle East. The green bean value chain offers business opportunities to various actors, particularly women because of their high involvement in production and marketing (Lutomia & Nchanji, 2022).

**Rwanda green bean (*Phaseolus vulgaris*)<sup>84</sup> or imiteja in Kinyarwanda is one of the major vegetable exports of Rwanda.** Green bean production is steadily rising local consumption and becoming the most important export vegetable crop (Mizero, 2018). Exporters sell fresh produce of green bean to overseas buyers (Verhofstadt & Maertens, 2013). It is a crop with great potential for addressing food/ nutritional insecurity concerns, in particular given the high nutrient content (see Table 4) and better incomes and for alleviating poverty. However, green beans are not considered one of Rwanda's priority crops

<sup>82</sup> <https://knoema.com/data/rwanda+foreign-trade-exports+green-beans>

<sup>83</sup> <https://naeb.gov.rw/index.php?id=112>

<sup>84</sup> [https://ehingirisoko.digital/welcome/articles/french\\_beans/production](https://ehingirisoko.digital/welcome/articles/french_beans/production)

for the Crop intensification program (CIP).<sup>85</sup> Green bean production is dominated by rural, small-scale farmers, especially women and the youth (Vasanthakalam & Karayire, 2009). The estimated green bean yield in Rwanda is between 11 and 14 tons/ha (Van Keulen et al., 2022). According to district officials, a hectare can produce 4 to 6 tons of green beans depending on the management and variety (Klls\_Gak\_13). Table 31 shows the average tons of green beans produced per annum for each district under this study, from 2017 to 2019. High production is observed in Rwamagana, while low production is in the districts of Ngoma, Rulindo and Kayonza. There is a lack of data on green beans at district level to inform the development of each actor along the value chain.

**Table 31: Average production by District of 2017, 2018 and 2019**

Province	District	French bean (average tons per annum)
Northern	Rulindo	7
Northern	Gakenke	87
Western	Nyabihu	-
Western	Rubavu	-
Eastern	Kayonza	12
Eastern	Rwamagana	1,263
Eastern	Ngoma	5
Eastern	Kirehe	-
Southern	Nyamagabe	122
Southern	Huye	273

Source: (Van Keulen et al., 2022)

**There are two main seasons for the export market in Rwanda:** high demand season (September to March --where major supply is mainly from irrigation) and low demand season (June to September --during the long rains when supply is too high, thus lower prices). Thanks to irrigation, vegetables are grown continuously throughout the year, without predictable planting and harvest dates. Due to increasing consumer preferences and health awareness for diversified fresh products, the global market for fruits and vegetables will continue to grow at the rate of 6 percent whereby it is expected to reach 5.4 trillion in 2023 (NAEB strategy: 2019-2024)<sup>86</sup>. Coupled with high labor

<sup>85</sup> CIP crops are maize, wheat, rice, white potato, beans, and cassava  
<https://www.degruyter.com/document/doi/10.1515/jafio-2021-0010/html>

<sup>86</sup> NAEB strategic plan (2019-2024).

requirements, green beans are grown on a small scale, possibly with staggered planting. Among the varieties of green bean (Vanilla, Annabel, The Prince, Teepee green Bean, Samantha variety and Ferrari variety), vanilla varieties (traditional and improved) are the most preferred for domestic, regional, and international markets. Table 32 shows green beans production data and varieties in the districts of Bugesera, Rwamagana, Kayonza and Gasabo in Rwanda. There are many pests, which include bean seed fly, aphids, Armyworms or Beet armyworms, Corn earworm *Helicoverpa zea*, Cut worm, Mexican bean beetle or *Epilachna varivestis*, and diseases in green beans (Rust, Angular Leaf Spot, Root Rots, Bacterial Blights, Anthracnose, Bean common Mosaic Virus (BCMV), Powdery mildew and Downy mildew) (Mondal et al., 2018). Popular pest management practices include treating the seed with insecticide before sowing. For management of diseases, common practices include crop rotation, use of certified seeds, field sanitation, use of resistant varieties and foliar sprays using chemicals.

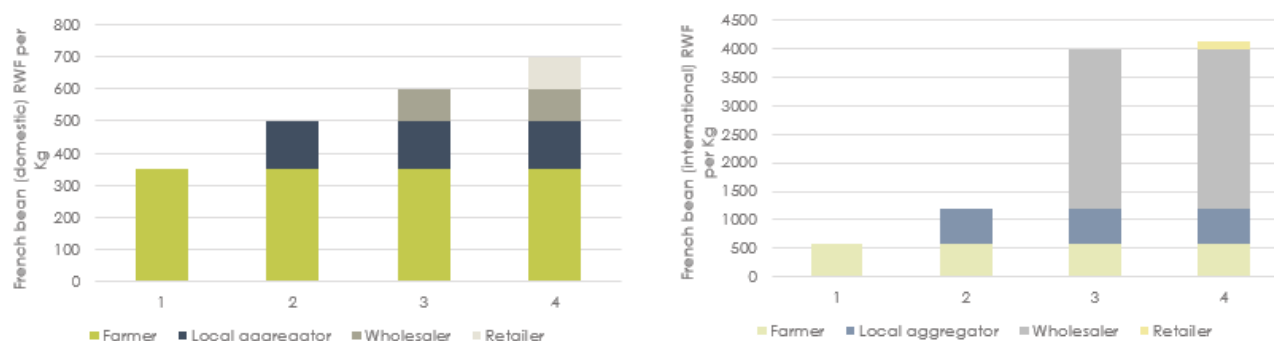
**Table 32: Green beans data in Bugesera, Rwamagana, Kayonza and Gasabo in Rwanda**

Indicator	Overall Finding
<b>Current Yield</b>	1407.56Kg/Ha
<b>Potential Yield for Rwanda</b>	11,996.35 Kg/Ha
<b>Yield Gap</b>	10,586.32 Kg Yield Gap per Ha A high average of 88 percent yield gap for green beans.
<b>Variety produced</b>	Vanilla, Serengeti, Samantha, Star 2053, Argus
<b>Varieties for domestic/regional markets</b>	Vanilla
<b>Varieties for international export market</b>	Vanilla Samantha
<b>Inputs Use</b>	Fertilizer (36.7 percent), Manure (41.9 percent), Pesticides (24.9 percent), Improved seeds (31.5 percent), Herbicides (7.8 percent) Own recycled (5.2 percent), Agri machinery (4.3 percent)
<b>Production Cost</b>	RWF 13,080/Are (\$13.77)
<b>Farmgate Net Profit</b>	RWF 920 / Are (\$0.97)
<b>Farmgate Prices</b>	RWF 200/Kg (\$0.21)
<b>Market gate price</b>	RWF 337.4/Kg (\$0.36) being the average prices and RWF. 400/Kg (\$0.42) in Gasabo.

Source: Field interviews

## Pricing

Similarly to tomato production, in the domestic french bean value chain, a significant portion of the final retail price is captured at the producer level. Figure 22 shows the price build up at various stages of the value chain when supplying the domestic markets. Given that such a high proportion of the value added is captured at the smallholder level, this indicates that for green bean, the focus of the SERVE project should potentially be on initiatives focusing on production. In the case of the international market, the vast majority of value added (53 percent) is captured at the wholesale or exporter level, which is beyond the current capacity of smallholder farmers.



**Figure 22: French bean value added for domestic and international consumption**

Source: (Van Keulen et al., 2022). \*Note French bean is used in the Van Keulen study, but the green bean price build up is likely to be very similar given the similarities of these products

**Based on the above analysis, the market potential score for green beans is 9.**

**It is necessary to add value to reduce or avoid post-harvest losses, increase availability during the off season, increase consumption, and generate a steady income.** The concept of value-addition for green beans was introduced in Rwanda in 2009 (Vasanthakalam & Karayire, 2009). The green bean value chain is shown in Figure 17. The main participants in green beans value chain are input suppliers, primary producers (smallholder farmers and out-growers), wholesalers and aggregators, transporters, traders (brokers and exporters) located in urban centers and exporters), other service providers, and consumers. The quality of green beans is related to cultivars and post-harvest handling and storage (Kinyuru et al., 2011). Harvesting begins from 6 to 8 weeks after planting depending on the variety and ecological conditions. When handling green beans, care should be taken to conserve the quality of the produce. The harvested beans should not be left in direct sun, and the harvest boxes should not be over-filled. Sorting consists of getting rid of broken, twisted, and perforated pods as well as plant debris while grading is done according to size of the produce. Packing green beans for export is done in boxes of produce that must be in conformity with the

European Union quality standard for green beans (standard EC 912/2001). Each box packed for the export market must display the product characteristics, i.e., name of producer/exporter, size, category, origin, etc. Packed green beans are kept in a cold room. For example, at 4°C and a relative humidity of about 80 percent can store green beans for a week.

**Most of the challenges and opportunities cut across all the districts in the study area.**

Table 33 shows detailed challenges and opportunities for Rwanda and the districts under study to export green beans. Generally, key opportunities for the green bean market and exports are explained by the existence of large unexploited domestic and international markets. Furthermore, green beans provide a big source of employment and income generation among rural youth and women. One of the challenges emphasized by exporters is the difficulty of obtaining large volumes for exports. For export to Europe, Rwanda faces with high competition with countries such as Kenya and Morocco, both of which have efficient, well-organized logistics and economies of scale due to large volumes (Van Keulen et al., 2022). Pre- and post-harvest handling is a major cause of reduced quantity and quality of green beans.

**Table 33: Challenges and opportunities for Rwanda to export French beans**

District	Opportunities	Challenges	Source
Gakenke	French bean is shorter in duration and requires less investment (comparative advantage), so it is an accessible business opportunity for both educated/well-off and uneducated/more disadvantaged youth, and for both males and females.	Key challenges are the low use of improved seed, weak market linkages, lack of machinery and equipment, limited access to credit by value chain actors, context-specific barriers that undermine women and youth involvement, and lack of storage facilities	Van Keulen (2022), Green bean FGD 7.11.2023_Gak_9  Lutomia et al. (2022).
Kirehe	Farmers need to produce green bean for the market through contract farming.	Limited information about this crop and lack of knowledge about its treatment with pesticides that against pests and/or disease, climate change with prolonged drought.	Farmer producers' interviews; 4.12.2023_Kir_10
Rubavu Nyabihu	Export diversification. Because women are dominant in the business of vegetables, it would be a great opportunity for them to expand the market and export this commodity	Inadequate management skills and bad quality of pesticides, and insufficient irrigation and postharvest equipment.	FGD with Farmers groups 27.11.2023_Nyab_1



District	Opportunities	Challenges	Source
Rulindo	Green beans appear to generate much higher levels of employment per ha of crop planted. They provide a big source of employment along the VC, and income generation among rural youth and women.	Lack of access to land for the youth, who do not own any land, translates into high cost of renting in addition to high costs of fertilizers for youth. For example, the cost of renting 1 to 5 acres varies Rwf 40,000 and Frw70,000 per one season depending on the region. The high cost of inputs is attributed to high costs of transport when imported via sea freight, and later transported by trucks from to Rwanda.	Farmer groups/producers interviews; 16.11.2023_RuI_4 Joint EU-ILO Government of Rwanda project report (2019).
Rwamagana	Women and men have opportunities to invest in agribusiness due to the customized agriculture extension services (CAES) from various interventions (LWH & SAIP projects).	The main challenge resides in the lack of aggregation strategy and post-harvest handling equipment like crates and cooling facilities. This lack increases the workload for women farmers because they have to carry the green bean produced on head unlike men who can ride bicycles or motorcycles.	FGD with famer group 7.12.2023_Rwa_2
Ngoma	Quality requirements for all sector of the markets is a problem to the green value chain players.	Market requirements is one of the biggest challenges accounted when growing green beans due to the lack of cooling facilities since green bean vegetables cannot be stored for some days. Pre- and post-harvest handling is a major cause of reduced quantity and quality	Interview with farmer producer, 5.12.2023 Katafiire et al. (2011)

Source: As listed

### 7.1.1. Green Beans Value Chain

Green bean value chain includes input system/supply (agro-dealers and private companies), producers contracted farmers, production by individual smallholders, and production by large and medium scale), aggregators/ wholesalers, retailers, exports, and service providers (Figure 22). Green bean production in Rwanda remains small-scale, and both farmers and out-growers constitute the foundation of the export value chain (Dijkxhoorn et al., 2016). According to farmer producers of green beans during the focus group discussions, packaging and storage node includes post-harvest activities such as sorting, grading, packaging, storage, transporting, distributing, and marketing.

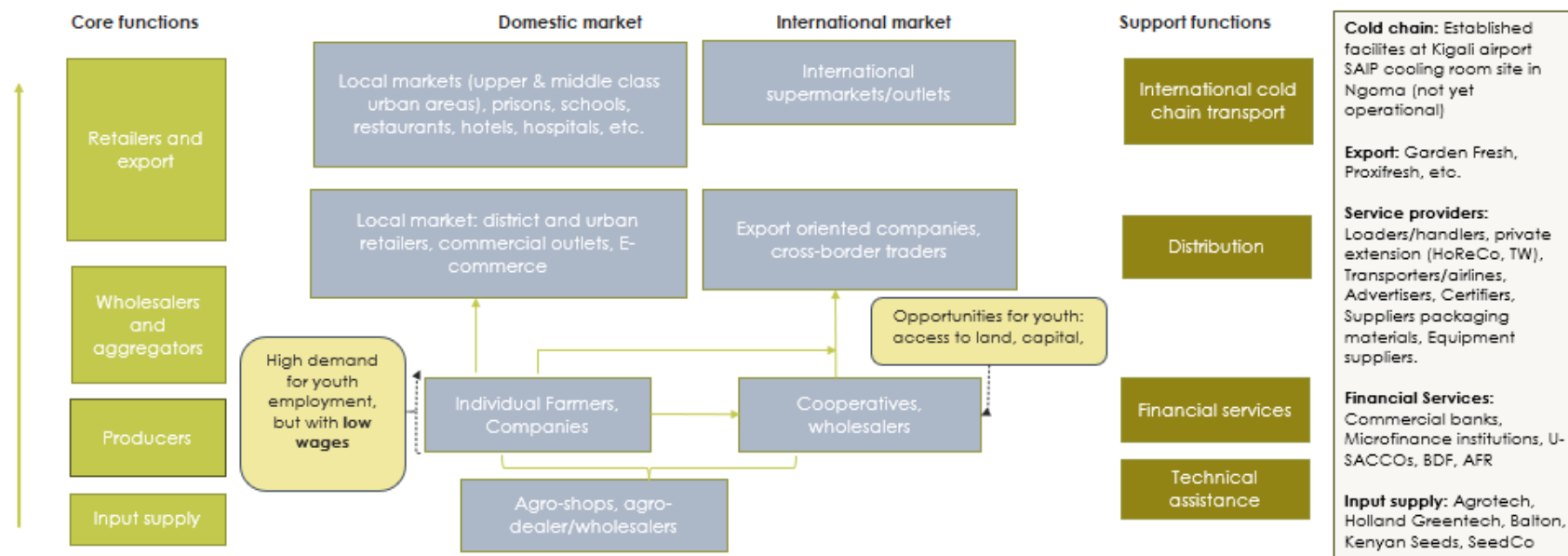


Figure 23 Green bean value chain schematic

### 7.1.1.1. Supporting services

For an overview of the extension services provided to green bean farmers please see section 2.1.4. Extension services and demonstration plots are available at the village level for various crops, but there is a notable gap in resources for green beans. Farmers express a need for additional training and access to demonstration plots specifically tailored to green bean cultivation. Unfortunately, extension services for green beans are not included in the subsidy program SMART Nkunganire. However, there are opportunities for acquiring irrigation equipment in the marshland, which could potentially enhance green bean production and address water scarcity challenges.

### 7.1.2. Value Chain Nodes

#### 7.1.2.1. Input Supply

**Input supply** does not specialize in green bean production, and it targets a multitude of horticulture and no horticulture crops (Dijkxhoorn et al., 2016; Van Keulen et al., 2022). Women and youth can be employed in input wholesale and agoshops as permanent staff, but the rate of employment is low as the owners have already their own employees. According to FAO (2022), the challenges for women and youth engagement in input supply include women's lack of capital to invest in their own agro-input businesses, and lack of entrepreneurship skills and specialized agrochemical knowledge.

The high costs associated with inputs such as quality seeds, fertilizers, and organic manure preparation, pose significant barriers for young female participants in the green bean value chain. For instance, the vanilla variety, priced at 15,000 Rwf per kilogram, presents a substantial financial burden. Additionally, the scarcity of assets like domestic animals exacerbates the challenge of acquiring organic manure, further hindering participation. Moreover, the lack of irrigation infrastructure compounds these obstacles, particularly during the dry season, as the high costs of irrigation materials such as pumps deter investment in irrigation equipment.

Furthermore, land tenure issues, coupled with the exorbitant costs of renting land, impede women's efforts to expand their involvement in green bean farming. The limited availability of cultivable land, attributable to small land sizes, constrains women's capacity to scale up their operations. These intersecting challenges underscore the need for targeted interventions to alleviate financial burdens, improve access to resources,

and address structural barriers, thereby enabling greater participation of women in the green bean value chain.

### 7.1.2.2. Production

#### Explanation

Green beans are grown from seeds and are sown directly into the seedbed. The process takes up to 60 days to mature in warm areas. This means that it takes one and a half to two months for green beans to grow to maturity. The seedlings do not tolerate temperatures lower than 10°C, but the optimum for production is 20-25°C (Chaukhande et al., 2017). With irrigation, green beans can be grown all-year round, but the main export season is from October to May. In areas with low rainfall (Kayonza, Ngoma and Kirehe), it is advisable to practice irrigation. In areas with well-distributed, medium to high annual rainfall of 900-1,200mm per annum, such as North-western (Gakenke, Rulindo, Nyabihu and Rubavu), rain-fed cultivation is possible. Farmyard manure is highly recommended to increase soil fertility.

**Commercial green bean production in Rwanda presents a promising opportunity for expansion into new markets at various levels - local, national, regional, and international.** While some traders currently export French beans to neighboring countries like the Democratic Republic of Congo (DRC) and Uganda, the potential for market growth extends beyond these immediate borders. The emphasis should shift towards exploring and tapping into regional and international markets, which offer larger scales of demand and economic opportunities.

#### Fit for youth/female employment

**Green bean production in Rwanda remains small-scale, and both farmers and out-growers constitute the foundation of the export value chain** (Dijkshoorn et al., 2016). The study found that women and youth are particularly constrained with the high costs of inputs (fertilizers, land rent and irrigation equipment). Studies concluded that women and youth are the ones heavily involved in the lower end of value chain components such as production and transportation to local markets (Me-Nsope & Larkins, 2015). Access to land is a challenge for youth female to enter green bean farming in the study area.

**During the interviews, respondents indicated that women and especially female youth participate in most activities of green bean farming.** The main challenges faced by women as compared to men include differential access to timely and adequate seeds of improved varieties, quality fertilizers, and pesticides; availability of credit at an

affordable interest rate; and equitable access to information (Dessaiegn et al., 2022). In all districts, participants said that farm level management practices for sustainable green beans farming include land preparation, seed selection, digging, sowing, mulching, weeding, pesticides, and fertilizer application, harvesting, market research, transporting the production to the market and selling. Land preparation, application of manures, fertilizers, mulches, irrigation and are the major energy-consuming inputs for green bean (Prasad et al., 2015). Green bean farming, which helps sustain soil fertility, fits well in cropping sequence for its short growth period and gives good economic yield to fetch good price in the market (Prabhakar et al., 2011).

Women and youth dedicate the most time in following up on growth and development of the green bean crop on the farm. Regarding decision-making, mostly, women and youth participate in decisions involving land preparation, seed selection, the size of land to use for production. The level of women and youth involvement and decision-making ability vary with the region across the study area. Interviews in Gakenke and Rulindo show that young female can share ideas for what to be done, **but mostly men are dominating in every decision**. There are no specific activities suited for female youth because they participate in each step of producing green bean, but compared to men, women participate in activities involving less strength-based physical exertion (weeding, field visits, irrigation through watering and harvesting and sorting). In Rubavu and Nyabihu, men are mostly involved in business related activities that bring quick cash.

Specifically, in North and East regions the green bean farming has been classified as a profitable business with huge employment opportunities for young female because the production cycle is short. Compared to dry beans, green beans have higher market value, grow fast after planting and have longer harvesting duration. Harvesting takes place within 50 days after planting, which means they mature much earlier. On top of that, green beans can be mixed with other crops like eggplant and chili, which can benefit women in terms of household nutrition and income generation. Thus, the costs of production are lower than any other crops. As one female farmer said:

« The green beans are a profitable cash crop to me as I invest less money compared to other crops. For example, for 3 acres, a farmer who invests 10,000 Rwf can gain a profit of 40,000Rwf during the first harvest.»

#### **Access issues for youth farmers**

**The strong consensus view from the field notes was that youth cannot afford to buy land, but they can access land through drained marshlands or other rehabilitated areas, and sharecropping.** Women and youth can venture in green bean farming as small-scale agripreneurs. Van Keulen et al. (2022) argued that for this to happen, access to land, water, knowledge, finance and markets are key. To benefit from them, this requires encouraging youth to become members of existing or new cooperatives. However, there are main challenges associated with the youth to join cooperatives, including negative mindset and lack of interest for the youth especially educated ones and the lack of capital to pay the membership fees (share).

### 7.1.2.3. Processing

#### Explanation

**Post-harvest handling and aggregation is critical to ensure acceptable quality in the market.** During harvest periods, long distances between growing fields and cooling facilities, and duration between harvesting, aggregation and cooling are very important and provide challenges to growers (Ogumo et al., 2018). According to farmer producers of green beans during the FGDs, the post-harvest activities include sorting, grading, packaging, storage, transporting, distributing, and marketing. Women are more in demand in the harvesting, sorting and packaging of green beans, but the youth seem to be not interested in such activities (Van Keulen et al., 2022). Women and youth have great opportunities in wholesale of green beans, but wholesale requires substantial investment and therefore considerable risks. There are six wholesalers operating at the main Nyabugogo market in Kigali, meaning that the potential for entering this market is low (Van Keulen et al., 2022). Participants reported that few women work in green bean value chain as wholesalers and retailers. Many women, as compared to men, are working in retailing sector, primarily buying and selling vegetables and green beans. They do not employ other people in their business but sometimes they can be assisted by young women (their kids). Green beans can be available in different forms, such as fresh, frozen, or canned. However, no special packaging, no processing and no storage are reported by farmers during the interviews in the study area.

**During FGDs with farmer producers, it was reported that, for the commodities with high perishability (like green beans), post-harvest handling leads to good quality production through avoiding the losses.** According to Ogumo et al., 2018, the high perishability of the green beans demands an effective and uninterrupted cold chain process. However, cold chain is only available for formal sector export focused businesses. Marketing and creation of selling points in strategic areas for female youth can increase the prices for producers and employment opportunities. While only exporting businesses are

concerned with certification, quality certification (organic products certificate) leads to higher prices for products at the international market. The FGDs and KIs revealed at production level, small scale female farmers do not have any specific information regarding the role of quality standards at national or global levels (FCS, Global GAP, SMETA). They use their own local knowledge and criteria when harvesting or sorting good quality beans by removing broken harvest and removing all harvest attacked by insects.

#### **Fit for youth/female employment**

Women, mainly young females can venture in the green bean value chain because it is a very profitable business with the advantage of creating employment and improve access to special markets like export market for female youth. According to the interviews conducted (FGDs and KIs), the biggest opportunities or areas for female with potential could be looked at improving production by adopting irrigation technology, and training on pest and disease management as well as post-harvest handling techniques. Agricultural modernization including use advanced water efficient irrigation system contribute to the increase of green production through increases in the efficiency of growth and productivity of green bean grown under environmental stresses (Kishore et al., 2023).

### **7.1.2.4. Distribution & Consumption**

#### **Explanation**

There exists significant potential for expanding into new markets at various levels, including local, national, regional, and international spheres. While some traders currently export green beans to the Democratic Republic of Congo and Uganda, the scope for potential markets extends beyond local borders. This potential encompasses regional markets as well as opportunities for international trade. Moreover, heightened investments and improved coordination from the National Agricultural Export Development Board (NAEB) in cold chain infrastructure, coupled with enhanced export facilities through RwandAir's increased freight capacity, have resulted in a growing number of export companies operating within the green bean sector.

The burgeoning demand within export markets further underscores the potential for expansion, with existing exporters already capitalizing on opportunities to export this commodity from Rwanda. This trend highlights the importance of continued efforts to foster growth and capitalize on emerging market opportunities, emphasizing the need for strategic investment and coordinated action to sustainably exploit the full potential of the green bean industry.

Increasing demand from hotels, restaurants and the general population, hence creating a ready market.

From the field interviews, it appears that very little in the way of packaging, processing and storage are done at the smallholder level. Further, there is very little activity in the way of post-harvest handling technologies to avoid the losses and spoilages.

### **Fit for youth/female employment**

Starting a retail business requires approximately RWF 50,000 (Van Keulen et al., 2022). RWF 50,000 is an amount which many young people, even those with limited education or skills, might be able to gather from their networks. However, access to both market space and suppliers is crucial for success. Securing space at vegetable retail markets can be challenging and varies from one district to another, so it is important to consult with the market management committee for permission. Additionally, this could be an appealing opportunity for young women interested in agribusiness.

### **Box 6: Proxi Fresh – french bean exporter**

Proxi Fresh, a Mauritian-based company led in Rwanda by Dannissen Chellen, commenced operations in 2014. Specializing in exporting French beans and spring onions, the company primarily targets the discerning French market within Europe. The company struggled initially due to supply chain constraints, farmer issues, and seed challenges and significant logistical obstacles, particularly sourcing inputs from Kenya while operating in Rwanda. Despite these challenges, Proxi Fresh persisted, emphasizing organic practices by refraining from synthetic fertilizers. Financing complexities in Rwanda posed additional hurdles, but the company capitalized on the region's fertile soil and achieved a commendable annual turnover of 1.2 million USD with a healthy profit margin of approximately 20%.

Proxi Fresh adopts a contract farming model, ensuring quality assurance through meticulous importation of all necessary inputs. With a strategic shift towards specializing in high-quality French beans since 2018, the company aims to expand its market reach to include Belgium and Germany. Additionally, plans are underway to diversify its crop portfolio to maintain soil health, thus facilitating sustainable production growth.

Investments in farmer training underscore Proxi Fresh's commitment to professionalizing local agriculture. The company maintains a two-week stockpile to optimize supply chain efficiency and adopts a direct payment approach to farmers, deducting input costs from final payments. While exploring opportunities



for regional production expansion, Proxi Fresh remains Global GAP certified, ensuring adherence to international quality standards.

Looking ahead, Proxi Fresh contemplates regional expansion and explores the possibility of venturing into neighboring markets like Congo. However, concerns over land overuse necessitate a cautious approach. The company's commitment to transparency is evidenced by the transition to cashless transactions and the adoption of MOMO payment systems for farmer remuneration.

Proxi Fresh grapples with logistical and packaging challenges, particularly the reliability and cost-effectiveness of locally sourced materials. Tax exemptions for imports alleviate financial burdens, although reliance on premium shipping services like KLM for exports contributes to substantial operational costs.

Proxi Fresh employs approximately 140 office and packing staff along with 20 outgrowers (minimum of 5 ha) managing substantial land parcels, Proxi Fresh has made significant socioeconomic contributions to the local community. The company's emphasis on outgrower schemes underscores its commitment to sustainable agricultural practices.

Source: Key informant interview Kig\_8

**Table 34: Roles and skill gaps of women and youth in green bean value chain**

District	Roles	Skill Gaps
Gakenke	Most activities of green bean farming (i.e. weeding, field visits, irrigation through watering and harvesting and sorting).	Farm management and post-harvest handling practices. Pest and diseases management. Household decision making.
Nyabihu	Farm management activities Farming and entrepreneurship skills for cabbage and carrots (not green beans).	Lack of awareness on green bean farming as it is a new crop to be grown in this area. Skills and knowledge related to commercial agriculture, and entrepreneurship skills for women and youth because most of them are risk averse.
Rubavu	Farm management activities Transportation and selling cabbages and carrots.	No prior information on green bean farming practices.
Rulindo	Green bean farming activities (i.e. fertilizer and manure application, digging, sowing, mulching, weeding, pesticides and fertilizer application, harvesting, market search,	Farm management practices on beans. Pest and diseases management.

	transporting the production to the market and selling).	
Rwamagana	Farming activities (i.e. and preparation followed by chemical fertilizer and manure application accompanied by seed sowing. Less participation of women in farming due to proximity to town. More involvement in off-farm activities (tailoring, mobile money agents, petty trade, etc.).	Quality certification in regard to bean production and marketing.
Ngoma	Activities from input acquisition to marketing are suitable for women based on their participation and fast adoption (level of participation(60 percent).	Improved post-harvest handling technologies. Market information.
Kirehe	Green bean farming activities (i. female are best performer in plantation, weeding, harvesting, and carrying production to the market.	Improved post-harvest handling technologies. Market information.
Kayonza	Activities from land preparations to postharvest handling and transport to market.	Skills and knowledge related to commercial agriculture, and entrepreneurship skills for women and youth because most of them are risk averse.
Nyamagabe	Green bean farming activities, post-harvest handling and transport.	French beans seeds are very expensive, but also quality seeds are very difficult to find. Its transportation from the farm to the market is very expensive.
Huye	-	-

Source: Field interviews

**Based on the above analysis the score for gender and youth participation, potential, and impact participation for green bean is 8.**

## 7.2. Risk and Vulnerability Analysis

**Different characters and yield potential of a crop depend on the agro-ecological requirements conditions prevailing during its growth** (Moniruzzaman et al., 2007). Green beans grow well in different soil types (sandy, loam to clay, which are high in organic

matter with optimum pH). Farmyard manure is highly recommended to increase soil fertility. It is well adapted in lower midland to lower highland zones of altitudes ranging from 1500-2100 meters above sea level.

The major environmental risks are drought, landslides, floods and pests and diseases. Drought can be controlled by irrigation. Irrigation is the most effective risk mitigation measures for drought in dry areas and terraces in areas prone to erosion. Farmers estimated that 500,000 Rwf can help establish irrigation materials. For landslides, in Gakenke, building terraces can cost 500,000RWF per hectare, and irrigating 1 hectare with a generator can cost 72,000RWF per season. In highland areas of Rulindo and Gakenke, terraces and IPM are more resilient measures than doing irrigation due to the poor irrigation facilities. Drought hazards are particularly of concern to the eastern plain districts of Kayanza, Kirehe, Rwamagana and Ngoma. Other districts are prone to landslides due to their moderate to very high slope susceptibility and heavy rainfall in the area (World Bank Group, 2021).

**Table 35: Environmental risks and mitigation measures identified by the green bean farmers in the study area**

District	Environmental Risks	Mitigation Measures
Gakenke	Landslides. Floods. Drought. Pest and disease.	Terracing Contour lines, dig holes to avoid water run-off. Bamboo planting on the ridges. Irrigation in summer. IPM and spray the biopesticides.
Kirehe	Drought and unexpected weather with too much or less rain than expected. Unknown pest and diseases.	Risk mitigation measures are irrigation practice, pest and diseases management.
Rubavu	Lot of rainfall. Heat and cold stresses. Diseases.	Pesticides application. Pest and diseases.
Nyabihu	Lot of rainfall. Heat and cold stresses. Diseases.	Pesticides application. Pest and diseases.
Rulindo	Landslides. Floods. Drought. Pest and disease.	Terracing, other soil and water conservation measures (AED, water channels, contour farming). Irrigation (Hillside irrigation and dam sheets) IPM and biopesticides.
Rwamagana	Drought. Diseases.	Irrigation practice. Bio pesticides.

Nyama-gabe	Pest and disease (example: tuta absoluta, early and late blight, mildew, etc). Risk of Soil erosion, flood, and landslides. Risk of climate change.	Insecticides and pesticides. Terracing and planting agroforestry. Mitigation efforts to reduce greenhouse gas emissions.
Huye	Drought and unexpected weather (too much or less rain) which can raise unknown pest and diseases resistant to many available pesticides. Soil erosion and floods.	Irrigation and diversification of pesticides, terraces (progressive and radical ones).
Kayanza	-	-
Ngoma	Drought. diseases and snowy rains.	The risks' management focuses on irrigation and pesticides' application.

Source: Survey (FGDs & KIs) with green bean producers (2023)

### 7.2.1. Ecological suitability

Due to its high labor requirements, green bean is recommended that it be grown on a small scale, possibly with staggered planting. It is grown for both fresh consumption and processing (e-Hingirisoko, 2023). The agroecological conditions required for growing French beans in Rwanda include (e-Hingirisoko, 2023):

**Soil:** French beans can grow in a variety of soils, from sandy to loamy to clay, that are rich in organic matter and have an optimal pH. The beans are sown directly into the seedbed and take 60 days to mature in warm areas. The optimum soil pH is 6.5 to 7.5, but the beans can tolerate a low pH as low as 4.5. Below pH 4.5, plant growth is impaired by limiting the development of the rhizobium bacteria responsible for nitrogen fixation in the galls formed on the bean roots.

**Rainfall:** Rain-fed cultivation is possible in areas with well-distributed, medium to high annual rainfall of 900-1,200 mm per year. However, irrigation is essential to maintain a continuous supply, especially during the off-season. Up to 50 mm of water per week is required.

**Temperature:** The optimum temperature for production is 20-25°C. However, depending on the variety, beans will survive in temperatures ranging from 14-32°C. Seedlings will not tolerate temperatures below 10°C. However, they grow well on friable (easily crumbled), silty loam to heavy clay soils that are well drained and rich in organic matter.

**Elevation:** French beans grow well in the lower midlands to lower highlands at altitudes of 1500-2100 meters above sea level.

## 7.2.2. Mitigation measures

General measures to mitigate environmental risk for horticulture value chains have been illustrated in Chapter 3.1.3. Here, VC-specific mitigation measures are presented.

The implementation of hedgerows on counter-bunds, especially in maize/bean production, serves multiple purposes in terms of adaptation, mitigation, and productivity enhancement. In terms of adaptation, French bean hedgerows are proving effective in reducing water runoff and preventing soil erosion. In addition to its environmental benefits, this method also contributes to on-farm resources by producing sticks suitable for beans, fodder, and firewood. From a climate change mitigation perspective, hedgerows play a crucial role in maintaining or even improving soil carbon stocks and organic matter content. When woody species are included, their potential for carbon sequestration, further aligning with climate change mitigation goals. The productivity aspect of hedgerow implementation is underscored by its positive impact on soil fertility, thereby supporting the maintenance or enhancement of overall productivity. This is consistent with sustainable agricultural practices that prioritize long-term soil health (World Bank & CIAT, 2015).

Crop rotation for soil health management and pest and disease control offer further opportunities for mitigating potential climatic and environmental risks. Rotation systems are carefully selected based on maturity, with preference given to crops that take at least 90 days to mature (Table 36). Chilies are particularly suitable to be rotated with French beans and, although chili production occurs mostly at smallholder farmers is noted (USAID, 2015, 2018a).

**Table 36: Suitable Crop Rotation with French Beans**

<b>Recommended as preceding crop</b>	<b>Crops that must not precede French bean</b>	<b>Crops that are harmless but have little beneficial effect on French bean</b>
Cereals (maize, sorghum, millet, wheat); fodder grass; cabbage and kale; turnip; beetroot; cassava; sweet potato; strawberries	All legumes (peas, beans, etc); lettuce; Irish potato; eggplant; cucumber; melon; zucchini; and okra	Groundnut; pepper; celery; carrot; onion; shallot; and garlic

Source: USAID (2015), adapted after Journal of Kenyan Horticulture

**Based on this analysis, the climate change impact (adaptation and mitigation) and other environmental benefits for green bean is scored a 4.**

### 7.3. Policy Analysis and Recommendations

For an overview of the major policy documents related to agricultural development see section 5.3. While district development strategies generally do not contain specific targets for the horticultural crops in this study, some targets for the horticultural industry in general are listed in Table 37.

**Table 37: District targets for vegetable/green beans production under district development strategies**

District	Targets 2021	Targets 2022	Targets 2023	Key activities/achievement
Gakenke DDS, 2018/2024	100ha 199 Tons	100ha 199 Tons	100ha 199 Tons	Increased non-traditional export crops: horticulture production: <ul style="list-style-type: none"> <li>Intensification of fruit trees (avocadoes, mangoes, citrus), pineapple, flowers, vegetable, and passion fruits plantations</li> </ul>
HUYE DDS (2018– 2024)	-	-	-	Promote local production of traditional and modern export crops (no green bean).
Kayonza DDS (2017-2024):	-	-	-	Increasing and scaling up the production of high-value crops: coffee, mulberry, vegetables, flowers and fruits.
Ngoma DDS (2018-2024):	0.65 Tons/Ha	0.68 Tons/Ha	0.71 Tons/Ha	Scale up the production of high-value crops (horticulture, flowers, vegetables, and fruits). Established mechanisms to increase access to finance & inputs to women and men farmers with timely access to quality seeds, and fertilizers. Sensitization of the farmers to grow high value non-traditional crops and also ensure that the inputs they need are supplied on time.
Rulindo DDS 2018-2024	320ha	370ha	420ha	Expanding the area of fruit, vegetable, stevia and mulberry plantations. Organization of vegetables growers into cooperatives. Construction of vegetables collection centers.
Rwamagana DDS (2018/19 – 2023/24)	850Ha	950Ha	1000Ha	Production of non-traditional export crops such as coffee, mulberry, vegetables, flowers and fruits.

District	Targets 2021	Targets 2022	Targets 2023	Key activities/achievement
Nyamagabe DDS (2018/19 – 2023/24)	-	-	-	Increased nontraditional export crops, including fruits and vegetables (green beans, avocado and maracuja)
Kirehe DDS	-	-	-	Suitable land and large marshlands for agribusiness: horticulture/vegetables in most of the sectors of most of the sectors).
Nyabihu DDS 2018/19-2023/24	450ha	500ha	550h	Production of non-traditional export products increased and farmers' cooperatives for value chains developed: <ul style="list-style-type: none"> <li>• Promote the production of horticulture.</li> <li>• Rehabilitate and increase the area planted with cash/high value crops.</li> <li>• Train women and men farmers in horticulture crops production and export of horticulture production.</li> <li>• Support agro-processing units inclusive of women farmers</li> </ul>

Source: District Development Strategies

**Based on the above analysis the score for institutional support for green bean is 4**

## 7.4. Framework for implementation

The study identified major skill gaps at production levels for small scale producer farmers in the following areas: farm management practices for green bean, pest and diseases management, post-harvest handling practices, standards and certification, and decision-making at household level regarding green bean production, marketing, and consumption. Farmyard manure is highly recommended to increase soil fertility but is not accessible to small scale producers without livestock. Quality certification (organic products certificate) leads to higher prices for products at the international market, but female farmers do not have access to information related to quality standards at national or global levels. Environmental risks such as erosion can be controlled by various soil and water conservation measures (e.g. terraces) in northern, western, and southern regions, whereas irrigation was found to be the most effective risk mitigation measures for drought in the study area and mainly in dry areas of eastern Province.

Women and youth have limited access to productive resources due the high costs: land or land rents, input (fertilizers, pesticides, and organic manures), and good quality seeds of green beans (i.e. vanilla variety), and irrigating equipment. This is added to the lack of capital to acquire those inputs and productivity-enhancing technologies (water pumps and other irrigation equipment). Second, it was found that extension services, demo plots and the subsidy (SMART Nkunganire) are available at village level for some crops, but not green beans.

There is increasing demand for export market for green beans. There are large unexploited domestic and international markets for green bean. The green bean value chain offers business opportunities to various actors particularly women who spend most of their time in production and marketing. Furthermore, there are opportunities in contract farming (out-grower scheme), export diversification, and access to extension services. In addition to many opportunities identified for women and youth in production of green beans, they have great opportunities in wholesale of green beans, input supply where they can be employed as permanent staff as wholesalers or retailers in agroshops, but this requires substantial investment. Women's lack of capital to invest in their own agro-input businesses, and lack of entrepreneurship skills and specialized agrochemical knowledge. Female youth are limited with the lack of access to land and other resources, and limited access to finances. The study recommends the following:

According to the interviews conducted (FGDs and KIs), the biggest opportunities or areas for female with potential could be looked at **improving production by adopting irrigation technology, and training on pest and disease management as well as post-harvest handling techniques**. Agricultural modernization including use advanced water efficient irrigation system contribute to the increase of green production through increases in the efficiency of growth and productivity of green bean grown under environmental stresses.

**Capacity building initiatives aimed at empowering women and youth involved in cash crop commercial agriculture**, including green bean production. By investing in human capital development, Rwanda can position itself as a formidable player in the global green bean market, leveraging its agricultural potential to drive economic prosperity and social progress. There is a clear need to enhance extension services within the green bean value chain.

**Improved financial support for farmers** is a key cross cutting issue and is discussed further in chapter 10.



**Improving infrastructure** such as feeder roads, selection/collection sheds, cold storage, transport facilities is somewhat beyond the scope of the SERVE project, however the project should advocate for enhanced facilities within district development strategies.

**If there is willingness to target the export market among smallholders, coordination and the establishment of contract farming initiatives** with smallholders (out-growers schemes) should be facilitated by the project. By facilitating contracts between vegetable producers, particularly green bean farmers, and exporters, the quality and consistency of the produce can be improved and potentially reach export quality levels. Proxi Fresh is a potential counterpart for this initiative. This approach not only ensures a stable supply chain but also strengthens the connection between local producers and global markets, fostering sustainable economic development.

## 8. Market systems analysis (passionfruit, cabbage, carrot, pineapple)

The study selected value chains that are currently produced within the ten District study areas, for which farmer groups and processors could provide tangible information on the potential and employment opportunities within these. The crops selected for this purpose **are cabbage, carrot, passion fruit, and pineapple.**

This chapter will not go into detail regarding these value chains, but provides an overview of the market potential as well as employment opportunities and the major risks and challenges associated with each.

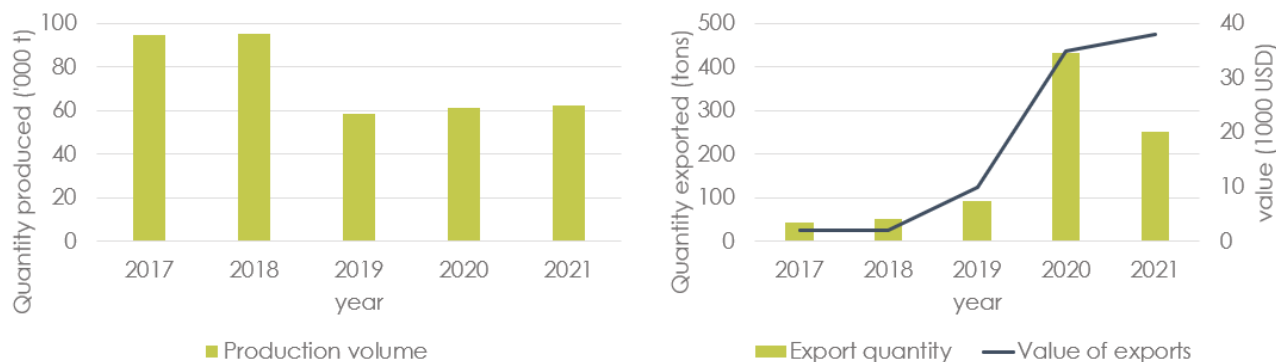
### 8.1. Cabbage

#### 8.1.1. Introduction and market size

Cabbage production in Rwanda is a significant part of the country's agricultural sector. Cabbage is primarily grown for domestic consumption. The Northern Province holds the top position among all regions in terms of cabbage production, with the Western Province, Southern Province, Eastern Province, and Kigali City Province following behind. Cabbage heads are highly valued due to their rich content of vitamins and minerals, making them an essential source of income for small-scale farmers in both rural and semi-urban regions<sup>87</sup>. Overall cabbage is a good crop because it has a short growth cycle, requires low investment, and commands strong domestic and regional demand. However, there is little scope for processing at present and low potential for export at present (Van Keulen et al., 2022). According to the FAO, the production quantity of cabbages and other brassicas in Rwanda was 62,527 tons in 2021 (see Figure 24). Exports of cabbage increased dramatically in 2020 and 2021 but still remain low in absolute terms (the maximum over the last five years was 40,000 US\$ in 2021).

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<sup>87</sup> <https://ehinga.org/eng/articles/cabbage/varieties>



**Figure 24: Production and export of cabbages, Rwanda**

Source: FAOSTat<sup>88</sup>

**Based on the above analysis, the market potential score for cabbage is 4.**

### 8.1.2. Value chain steps

The cabbage value chain involves several key stages from production to reaching the final market. Beginning with field preparation and the establishment of nursery beds, it progresses through transplantation, weeding, and the application of fertilizers. The management of pests and diseases is crucial, with pesticides being applied as needed. Ongoing crop management and follow-up activities lead to the eventual harvesting of cabbages. Post-harvest handling activities, such as cleaning and sorting, are undertaken, followed by packaging for transportation to markets. The final step in the process involves marketing the cabbages (interview with producer, 2022, Rub\_3).

Various actors play essential roles in cabbage farming, each contributing to the success of the value chain. Producers, organized in cooperatives, small groups, or as individuals, form the backbone of cabbage farming. Different categories of labor, working with producers and partners, perform various functions crucial to the production process. Input suppliers, including agro-dealers, provide necessary materials. Transporters, utilizing various means such as trucks, bicycles, and motorcycles, assist in transporting the produce. Traders, comprising wholesalers, aggregators, and retailers, facilitate the distribution of cabbages. Finally, consumers, ranging from individual clients to hotels, restaurants, schools, and other institutions, play a vital role in sustaining the entire farming process.

<sup>88</sup> <https://www.fao.org/faostat/en/#data/TCL>. <https://www.fao.org/faostat/en/#data/QCL>.

Several requirements are essential in the production of cabbages, encompassing inputs, labor, transport, and considerations for value addition. In terms of inputs, key necessities include land, improved seeds, various equipment, and tools, as well as both organic and chemical fertilizers and pesticides. Regarding labor, cabbage cultivation is relatively less labor-intensive compared to some other crops like tomatoes or Irish potatoes. However, it still demands labor, particularly during crucial stages such as field preparation, nursery bed preparation, transplantation, weeding, fertilizers and pesticides application, harvesting, transportation, cleaning, sorting, and packaging. Transportation is done on foot, or using vehicles and bicycles, depending on the distance to markets or clients.

Women in cabbage and green beans farming play an important role because they dedicate their most time in following up for those commodities from initial stage of production to harvesting time. Regarding decision making, focus group interviews reported that women play a role in decision making and cabbage offers them a steady stream of income.

In terms of value addition, farmers engage in activities such as removing old leaves, eliminating diseased cabbages, and sorting smaller cabbages from larger ones, however there is not currently a significant processing element in the cabbage value chain. Farmers need a designated space or site for sorting, removing old leaves, and, if necessary, cleaning the cabbages, similar to the process used for carrots.

Cabbage cultivation can be profitable. Cabbage requires minimal labor and inputs, comparable to other value chains such as tomatoes and Irish potatoes. Additionally, the relatively short maturation period of three months sets cabbages apart from crops like maize and Irish potatoes, contributing to quicker returns on investment. The widespread consumption of cabbages across various demographic categories, including individuals, schools, hotels, and restaurants, ensures a broad market base. However, it is essential to note that profitability can be influenced by market dynamics; when cabbages are not oversupplied, they command a fair price. Conversely, an abundance of cabbage in the market can lead to low prices, and in some instances, farmers may struggle to find buyers, resorting to using the surplus as livestock feed.<sup>89</sup>

For cabbage... all activities are suited for female youth because they participate in each step activity of production compared to men.

RuL\_4

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<sup>89</sup> Field interview 22.11.23, RuB\_3

Based on the above analysis the score for gender and youth participation, potential, and impact participation for cabbage is 8.

### 8.1.3. Main challenges

The primary challenges within the cabbage value chain include, but are not limited to:

**Market Instability:** Cabbages face market uncertainties, often losing demand when produced in large quantities, leading to surplus utilization as cattle feed.

**Perishability:** Cabbages lack storage facilities for prolonged periods, necessitating immediate harvest and sale upon ripening, with cold room storage being the only available option.

**Input Accessibility Issues:** Farmers encounter difficulties in obtaining timely supplies of essential inputs such as fertilizers, pesticides, and quality cabbage seeds, leading to planting delays and seasonal production disruptions.

**Financial Constraints:** Despite the relatively low demands of cabbage farming, limited financial capacity poses challenges, requiring funds for tasks like land rental, material acquisition, input purchase, and labor payments.

**Climate Variability:** Weather fluctuations, including excessive rainfall and drought conditions, adversely impact cabbage crops, causing damage and yield loss.

Heavy rains cause rotting and loss (Rub\_3, RuL\_4) (measure against floods: terracing)

Drought prevents good growth (irrigation is mostly not possible because it is too expensive)<sup>90</sup>

Lack of access to climate information is a problem<sup>91</sup>

**Pest and Disease Vulnerability:** Cabbages are susceptible to higher levels of pests and diseases, leading to reduced harvests and low production. The main disease risks are Black rot (brought on by heavy rain), Bacterial soft rot (usual appears during storage), and Downy mildew. These can all be managed with pesticides and other techniques such as quick removal of infected plants and managing harvest correctly<sup>92</sup>.

**Land Accessibility for Youth and Women:** Limited availability of land poses a specific challenge for youth and some women, who may require larger areas and modern

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<sup>90</sup> (Rub\_3, RuL\_4)

<sup>91</sup> RuL\_4

<sup>92</sup> ehinga.org

technology for efficient farming. The inability to access land is often due to parental reluctance or financial constraints for these specific groups.

**Lack of Processing Opportunities:** Cabbages lack processing options, limiting value addition and diversification within the value chain.

#### 8.1.4. Employment opportunities within the value chain

An overview of the attractive value chain nodes for employment for predominantly female youth is provided in Table 38.

**Table 38: Employment opportunities in cabbage value chain**

Node	Employment opportunities in cabbage
Input supply	Uncertain
Production by Small-holders	Engaging in transplanting, tending to the fields, fetching water during pesticide application Sustainable practices Involvement from initial stage of production until harvesting Opportunity: Improving Production by using modern technologies and establishing post-harvest handling equipment to avoid loss
Production by Commercial Farms	Very limited
Aggregation and Wholesale	Very limited
Processing	Engagement in cleaning and sorting (per size and health) Opportunity: Technology adaptation (e.g. in cleaning), young people can learn that faster
Retail	Engagement in Marketing (there are high demands) Opportunity: Retailing requires little financial capacity
Export	Diversification: Expanding the market and export of cabbages Quality Certification Opportunity: Accessing new markets

Source: Rub\_3, RuL\_4

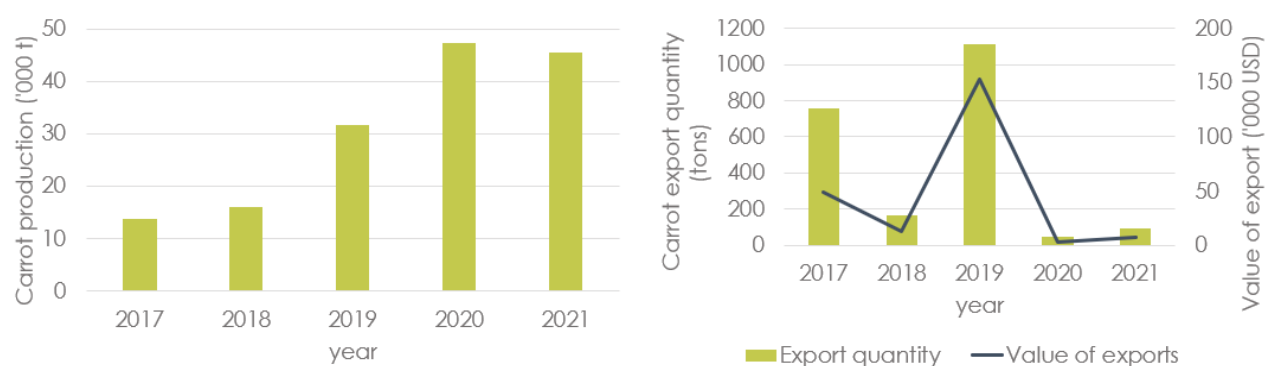
## 8.2. Carrot

### 8.2.1. Introduction and market size

Carrot cultivation comes with various positive aspects, including its easy cultivation process and low production costs. The crop has a short growth season of 2-3 months, offering the potential for high yields, catering to both family food security and the fresh market. The productivity and profitability of carrot farming become evident when farmers diligently manage and supervise each activity in a timely manner. Additionally, carrots can be stored in the field for up to three months, providing flexibility and sustainability, even in the absence of immediate customers.<sup>93</sup>

Nevertheless, challenges exist within carrot cultivation. The lack of access to climate information poses a potential obstacle. Similarly, the absence of readily available market information can hinder farmers' ability to make informed decisions. The high risk of diseases and associated elevated costs of pesticides present further challenges. Furthermore, the lack of cold storage facilities contributes to post-harvest losses. These challenges underscore the need for improved access to information and infrastructure to enhance the overall resilience and success of carrot farming endeavors.

While production of carrots has increased significantly in the last five years, formal sector exports are highly volatile, and the export market has not yet reached significant volumes, while domestic production appears to be on a healthy trajectory in recent years. The production and export statistics are shown in Figure 25.



**Figure 25: Production and export of carrots, Rwanda**

Source: FAOSTat<sup>94</sup>

**Based on the above analysis, the market potential score for carrot is 6.**

<sup>93</sup> Field notes from interviews with producers - Rub\_5, Rub\_4 and RuI\_5

<sup>94</sup> <https://www.fao.org/faostat/en/#data/TCL>. <https://www.fao.org/faostat/en/#data/QCL>.

### 8.2.2. Value chain steps

The carrot value chain encompasses various stages from cultivation to reaching the final market. It begins with field preparation, followed by planting, weeding, and the application of fertilizers and pesticides. The cultivation process involves ongoing management and follow-up activities, leading to the crucial stage of harvesting. Post-harvest handling activities, including cleaning and sorting, are undertaken, followed by packaging, processing, transportation to the market, and finally, marketing.

Carrot farming involves a network of essential actors that complement each other. These actors include producers organized in cooperatives, small groups, or as individuals. A diverse range of labor, working with producers and partners, performs various functions. Input suppliers, such as agro-dealers, provide necessary materials, while transporters assist in delivering the produce. Traders, encompassing wholesalers, aggregators, retailers, or processors, play a crucial role in the distribution process. Consumers, comprising individual clients, hotels, restaurants, schools, and other institutions, form a pivotal part of the carrot value chain.

Women and youth play a crucial role in carrot production, with women particularly contributing significantly to various tasks such as planting, weeding (a cultural norm in this district), fetching water during pesticide application, cleaning, sorting, and marketing. Their involvement is estimated to be around 75%, as men and young males mainly assist them in tasks like preparing the field, planting seeds, applying pesticides, and carrying heavy loads. Despite their lower participation in some physical tasks, young females often join their mothers in these activities as they require less effort. Decision-making within the production and marketing processes is equitable, reflecting the substantial influence of women and youth throughout the value chain. Their significant presence underscores their importance in driving the success of carrot production from start to finish.

The production of carrots necessitates various inputs, including land, seeds, equipment, tools, chemical fertilizers, and pesticides. While carrots are considered less labor-intensive compared to certain crops, cultivation involves labor during field preparation, planting, weeding, fertilizers and pesticides application, harvesting, transportation, cleaning, sorting, and packaging. Delivery and distribution require sacks, vehicles, or other means of transport, along with the necessary labor. Value addition considerations involve potential carrot processing, requiring expertise, processing machines, additional products for juice making, and packaging materials.



Carrot farming proves to be profitable due to several factors. It boasts low production costs, requiring minimal labor and inputs, comparable to other value chains such as tomatoes and Irish potatoes. The short maturation period of three months distinguishes carrots from crops with longer growth cycles. Carrots enjoy market availability throughout the year, ensuring consistent demand. Although prices may fluctuate based on quantity, carrots cater to a diverse consumer base, including individuals, schools, military camps, hotels, restaurants, and processors. The relatively stable price of carrots throughout seasons minimally impacts actors in the value chain, contributing to the overall profitability of carrot farming.

Carrots exhibit adaptability to a variety of climatic conditions in Rwanda, but their optimal performance is observed under moderate temperatures. They thrive in well-drained, friable loam that is free of stones and hard soil clods.<sup>95</sup>

- Risk of droughts: In drought season it is not possible to produce without irrigation, which beyond the financial means of most farmers<sup>96</sup>
- Risk of floods, high rainfall leads to loss: possible measure is terracing<sup>97</sup>

**Based on the above analysis the score for gender and youth participation, potential, and impact participation for carrot is 8.**

### 8.2.3. Main challenges

The major challenges to carrot production outlined in the field interviews are outlined below:

**Entry Barriers in Value Chain:** Entry into the carrot value chain demands financial capacity, with consistent barriers affecting individuals irrespective of age or gender.

**Storage Challenges:** A significant hurdle is the lack of storage facilities, restricting the ability to store carrots for an extended period after harvesting, especially in the absence of immediate markets.

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<sup>95</sup> ehinga.org

<sup>96</sup> Retailer aggregator interview 22.11.23 (Rub\_4), producer group interview 16.11.23 (RuL\_5), Co-operative interview Kotibanya, 22.11.23 (Rub\_5)

<sup>97</sup> Ib id.

**Market Information Limitations:** Limited market information poses challenges, with many carrot traders unaware of optimal selling locations, affecting their ability to secure good prices for their produce.

**Seasonality Barrier:** Carrots face seasonal availability challenges, leading to market fluctuations and low prices due to increased production from numerous producers.

**Gender Disparities in Market Access:** Men often have the advantage of actively seeking customers nationwide, while women and youth encounter barriers, restricting their access to adequate market information.

**Responsibility Burden for Women:** The multitude of responsibilities placed on women, confining them to home duties, serves as a barrier, hindering their ability to explore markets beyond their immediate surroundings.

**Confidence Issues for Women:** A lack of self-confidence among women in the value chain results in many engaging in small-scale businesses, limiting their potential and impact within the industry.

#### **8.2.4. Employment opportunities within the value chain**

Table 39 outlines the major employment opportunities within the carrot value chain.

**Table 39: Employment opportunities in carrot value chain**

<b>Node</b>	<b>Employment opportunities in carrot</b>
Input supply	Uncertain
Production by Small-holders	Participation in each activity from land preparation to harvesting Decision making in what, where and how to cultivate carrots Opportunity: adopting modern technologies and post-harvest handling equipment to avoid loss
Production by Commercial Farms	Very limited
Aggregation and Wholesale	Very limited
Processing	Participation in cleaning and sorting They heavy lifting task of packing and transporting carrots are generally done by men. Opportunity: Technology adaptation (e.g. in cleaning), young people can learn that faster
Retail	Opportunities in trading Engagement in Marketing Opportunity: Retailing requires little financial capacity
Export	Diversification: Expanding the market and export of cabbages Quality Certification Opportunity: Accessing new markets

Source: Rub\_4, Rub\_5, RuI\_5

## 8.3. Passion fruit

### 8.3.1. Introduction and market size

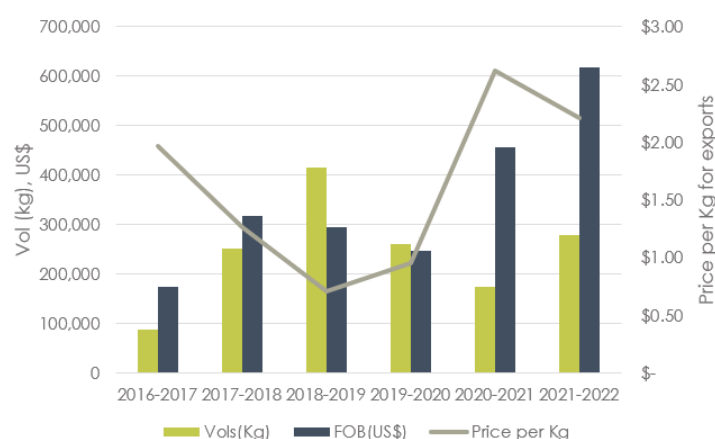
Passion fruit holds considerable value as an export crop.<sup>98</sup> Despite being in early stages in terms of export stages, it has demonstrated export potential comparable to French beans and chili, reaching approximately USD 300,000 in exports in 2019. However, it faces challenges such as the lack of stable customers. Nevertheless, the crop proves to be highly profitable with significant domestic demand, leading to enthusiastic investments from farmers. The initial phase may pose challenges for cash-strapped youth farmers due to the three-year growth cycle and minimal profit in the first year (Van Keulen et al., 2022).

<sup>98</sup> Farmer interview in Nyamagabe, 5.12.23 Nyam\_6

Smallholders play a crucial role in passion fruit production, with fresh produce reaching retailers and consumers through various aggregations like cooperatives and wholesalers. Rwanda's passion fruit market involves both import and export activities, strategically prioritized as a horticulture export commodity by the National Agricultural Export Development Board (NAEB). The value chain includes small processors specializing in concentrates and ready-to-drink juices. Support organizations and projects, such as the Rwanda Agriculture Board (RAB) and the HortInvest project, actively contribute to the passion fruit value chain.

Passion fruit is popular within Rwanda, particularly in the northern and western provinces, catering to both domestic consumption and the export market. Two main passion fruit varieties are cultivated: the bright yellow or golden passion fruit with grapefruit-sized, smooth, glossy, light, and hairy skin, and the smaller, less acidic dark purple variety with a richer aroma and flavor resembling a lemon. Despite the focus on exports, a significant portion of passion fruit is cultivated for the domestic market.

Rwanda's passion fruit production has experienced significant growth over the years, transitioning from a net importer in 2016/17 to a net exporter in 2018/19. This shift is attributed to increased interest in the crop from European and Middle Eastern markets, along with enhanced cross-border trade. The Horticultural Exporters Association of Rwanda (HEAR) particularly emphasizes the United Kingdom as a key destination for passion fruit exports from Rwanda (Van Keulen et al., 2022).



**Figure 26: Passion fruit export, quantity, Free on Board (FOB export) value and prices over time**

Source: (NISR, 2022)

**Based on the above analysis, the market potential score for passion fruit is 8.**

### 8.3.2. Value chain steps

Farmers choose a suitable plot based on crop rotation, avoiding the cultivation of passion fruits or other crops with similar pest and disease management consecutively. Plot Preparation: Ploughing, leveling, and digging holes are carried out with specific spacing (40cmx60cm) for optimal plant growth. Seedlings are either prepared in pods or without pods, sourced from selected plots free from pests and diseases. Seedlings are ready for transplantation after 2.5 months in the nursery. Before transplantation, the plot is deeply ploughed and leveled. Each hole receives 15 kg of manure or compost. Trellises are built to support plant growth and facilitate harvesting. Trellises are constructed with stakes and metallic wires, spaced at 2.5m intervals. Two horizontal wires are tied at specific heights to support the climbing vines.

Passion fruit is quite labour intensive and requires continuous weeding, pruning, and pest and disease management are carried out throughout the growth cycle. There is also quite a high requirement for pesticide use. Passion fruits production is reportedly split 70:30, men: women, due to the physical labor required for building trellises. Women tend to be focused on weeding and harvesting activities.<sup>99</sup> The first harvest starts after one year from plantation, with a total lifespan of 2-3 years, including 1-2 years of harvesting. Harvesting is continuous, and the yield decreases from 500kg/month for the first harvests to 40kg/month for the last ones. The harvested passion fruits are sold to wholesalers in Kigali/Nyabugogo (Mutangana) at approximately 1800Rwf/kg. The estimated production value per hectare is 11,000,000 Rwf, with a production cost of 4,000,000 Rwf/ha.<sup>100</sup>

**Based on the above analysis the score for gender and youth participation, potential, and impact participation for passionfruit is 7.**

### 8.3.3. Main challenges

**Rising Input Costs:** increasing prices for seeds and fertilizers, which could impact the overall cost of production for pineapple farmers. It is challenging to find **good quality seeds**, suggesting potential difficulties in obtaining reliable and high-quality planting materials. Passion fruit is also **highly perishable**, and the **lack of suitable storage** facilities

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<sup>99</sup> Interview with farmer group in Kirehe 4.12.23 Kir\_12

<sup>100</sup> Interview with farmer group in Kirehe 4.12.23 Kir\_12

contributes to high post-harvest losses.<sup>101</sup> **Pest and disease** can also be devastating for passion fruit producers<sup>102</sup>.

Passionfruit also requires irrigation and well-drained soil and is seen more as a cash crop than as a crop providing food security.

#### 8.3.4. Employment opportunities within the value chain

Table 40 outlines the main employment opportunities within the passion fruit value chain.

**Table 40: Employment opportunities in the passion fruit value chain**

Node	Employment opportunities in carrot
Input supply	Work as agents for existing agro-wholesalers and agroshops. Focus on providing inputs for multiple crops. Explore opportunities with nurseries selling passion fruit seedlings.
Production by Small-holders	Secure land and market access, preferably with cooperative and government support. Uneducated youth can benefit from training programs. Employment options include seasonal wage labor on smallholder farms. Limited international export opportunities currently. Low wage rates for unskilled work in the sector.
Production by Commercial Farms	Requires a significant investment to establish a commercial farm from scratch. Offers diverse tasks suitable for both educated and uneducated youth. Limited number of commercial farms and exporters in the field. Low wage labor rates for unskilled work.
Aggregation and Wholesale	Volumes are currently small, and there is limited specialization in this venture. Mainly involves occasional wage labor with existing brokers and wholesalers. Sourcing is done by processing units from various districts and Burundi.
Processing	Potential for growth in processing, but agripreneurship expansion expected to be low.

<sup>101</sup> Interview with retailer in Gakenke 4.12.23 Kir\_12

<sup>102</sup> [https://ehinga.org/eng/articles/passion\\_fruits/pests\\_and\\_diseases/](https://ehinga.org/eng/articles/passion_fruits/pests_and_diseases/),  
<https://www.fao.org/rwanda/news/detail-events/en/c/1103017/>

Node	Employment opportunities in carrot
	Anticipate less than 50 new MSMEs (Micro, Small, and Medium Enterprises), compared to the current 14. Growth in agripreneurship contributes to employment. Opportunities in increasing the business of existing processors.
Retail	Strong domestic demand, but low volumes per retailer
Export	New area – highly uncertain
Service providers	Private extension services (e.g., HoReCo, TM), logistics (transporters, loaders), marketing, export consultants, and import of packaging materials, ingredients, and processing equipment. Particularly suitable for educated youth. Limited opportunities for youth employment, but the impact of service providers on upgrading the Value Chain (VC) could be substantial.

Source: (Van Keulen et al., 2022), Kir\_12

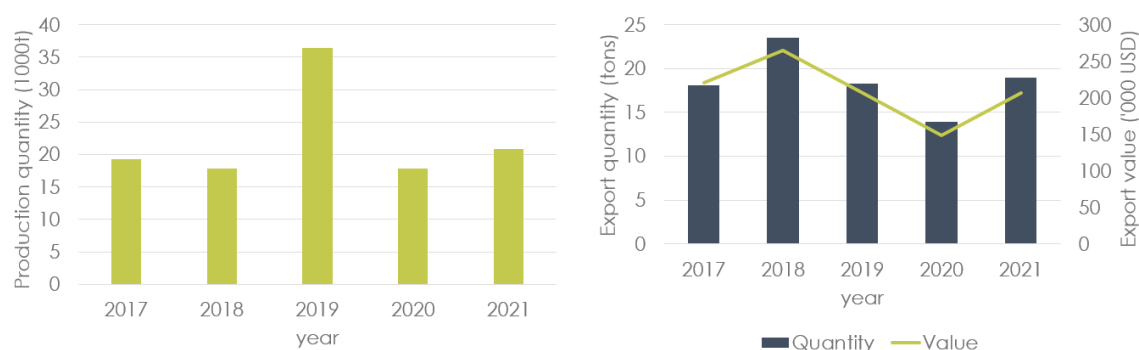
## 8.4. Pineapple

### 8.4.1. Introduction and market size

**Pineapple Production Distribution:** Pineapple is grown in all regions, with the Northern Province being the largest producer, followed by the Southern and Eastern regions. The Western region contributes the least to pineapple production. Pineapple is considered a tradeable crop and plays a significant role in generating reasonable income for producers.<sup>103</sup>

USAID 2018 identified Gakenke, Ngoma and Kirehe as particularly suitable for pineapple production and also identified the smooth cayenne variety as being the most suitable for export (USAID, 2018a).

<sup>103</sup> Retailer interview 15.11.23 Gak\_5



**Figure 27: Production and export of pineapple, Rwanda**

Source: FAOSTat<sup>104</sup>

Inyange is engaged in the business of producing and selling a wide variety of fruit products, including fruit juice concentrates, fruit juice drinks and dairy related products. The products are primarily sold to the local market, as well as regionally via Inyange certified distributors. Inyange is the largest buyer of pineapple from farmers in the Eastern province, sourcing up to 48 tons per week for juice production for local and regional sale (USAID, 2018a).

On the retail side of pineapple production there is strong involvement of women with over 90 percent of employed being female, and mostly tasked with purchasing, packaging, and selling. There is little role for standards in the pineapple market, given that exports remain relatively low.

**Based on the above analysis, the market potential score for pineapple is 6.**

#### 8.4.2. Value chain steps

While there were no papers identified focusing on the Value chain in Rwanda, a paper from nearby Ethiopia identified the following steps for pineapple production and marketing (Gessesse et al., 2019):

**Input Suppliers:** Provide necessary inputs such as seedlings, fertilizers, and agrochemicals to pineapple farmers.

**Producers:** Smallholder farmers who cultivate and harvest pineapples.

**Collectors:** Individuals or entities who gather the harvested pineapples from the farmers.

<sup>104</sup> <https://www.fao.org/faostat/en/#data/TCL>. <https://www.fao.org/faostat/en/#data/QCL>.



**Retailers:** Sell fresh pineapples to local markets or consumers.

**Wholesalers:** Purchase large quantities of pineapples for distribution to retailers or processors.

**Processors:** Entities involved in processing pineapples into products such as juice, canned fruit, or dried fruit.

**End Users:** The final consumers of pineapple products, which can include domestic and international markets.

### 8.4.3. Main challenges

One of the main issues with Pineapple, from a smallholder farmer perspective, is the long gestation time of 14 months before pineapple trees begin to bear fruit (USAID, 2018a). Further, pineapple is subject to disease risk, with a major incident in 2016 leading many farmers to become discouraged by pineapple production (USAID, 2018a).

### 8.4.4. Employment opportunities within the value chain

From the limited interviews and sparse available evidence, the best opportunities for pineapple appear to be in the **production node**, as well as the retail node. Processing is a high input and can be capital intensive, and while there exists plenty of opportunity, it will be difficult to generate significant numbers of jobs within this value chain node.<sup>105</sup>

According to field interviews, more than 90% of those working in the retail business in Gakenke are women, and are involved in a range of tasks from purchasing, packaging to selling.

**Based on the above analysis the score for gender and youth participation, potential, and impact participation for pineapple is 7.**

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<sup>105</sup> Gak\_5

## **Thematic Report 2: Gender and youth inclusion**

## 9. Gender and youth inclusion analysis

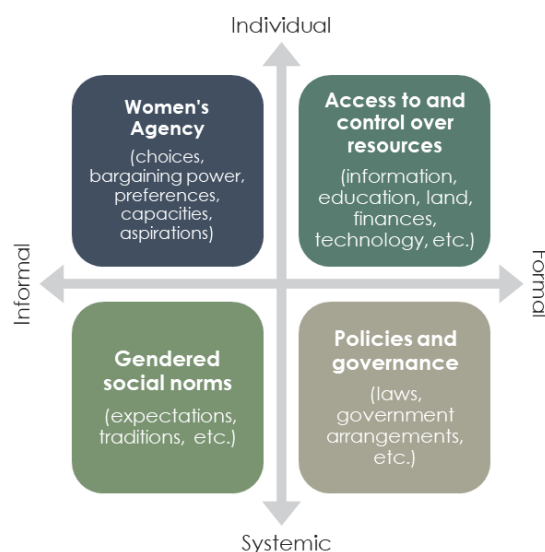
### 9.1. Introduction and Methodology

#### Background and Objective

**The overall objective of the assignment was to conduct a thorough value chain analysis.**

In this context, the comprehensive analysis of the current status for gender mainstreaming and climate adaptation and mitigation efforts across all nodes of the prioritized value chains was conducted.

**The current discourse on agri-food systems and gender focus on a multi-dimensional space of factors that impact gender equality:** On individual and systemic factors, and on formal and informal factors. To create fair and just food systems, it is necessary to make changes that promote gender equality across all four factors. This involves shifts in the consciousness, capacity, behavior, and awareness of both women and men on



**Figure 28: Gender Dimensions**

(Source: Adapted from Njuki et al., 2023)

an individual and informal level (women's agency). It also includes ensuring access to resources, services, and opportunities for individuals in a formal context. Furthermore, changes are needed in informal and implicit cultural norms, the deep structure, and the social values influencing how institutions operate on an informal and systemic level. Lastly, reforms should extend to formal policies, laws, and institutional arrangements at a formal and systemic level, aiming to prevent social and gender discrimination and promote equality (Njuki et al., 2023).

**Within this multi-dimensional space, the SERVE project will have different levers to**

**impact gender inequalities and promote the inclusion of young women and vulnerable groups.** Even though it cannot be expected that the project is able to address all factors (e.g. laws, policies, or governance arrangements at the formal level), some of them remain within the reach of the selected value chains (e.g. women's agency, access to project resources).

**Based on the multi-dimensional space, the gender analysis focusses on four key areas** that impact gender relations and job or business opportunities for youth and women in the agricultural sector and respectively in the selected value chains:

- Access and control over resources for youth and young women, including the impacts of gender and power dynamics in agriculture value chains and more specifically in the selected value chains and access to financial resources;
- Gendered social norms, including social expectations, traditions, family dynamics/impact of family members, and double work burden.
- Young women's agency, bargaining power, personal aspirations, and access to decision-making
- Opportunities and Capacities for Responding to Climate Change

**In addition, an assessment of intersectional factors and dynamics affecting people with disabilities and refugees was conducted** as a cross-cutting topic. A specific section of the report is dedicated to highlight the challenges faced by women with disabilities and female refugees. Yet, as the report takes an intersectional approach, findings on this concern are integrated across the complete gender analysis.

**Based on the above findings, the gender analysis summarizes key gender issues and inequalities encountered by value chain actors of the selected value chains.** More detailed information on the individual value chain context can be found in the reports on the respective value chains.

**Finally, the analysis shows up key strategies and actions** that can be taken to engage female youth in project implementation and address gender-inequalities.

## **Review of Existing Studies and Primary Data Collection**

**For this analysis, a review of the existing studies supplemented with primary data collection from key informants at national, district up to the community level was conducted** to provide a comprehensive and updated status of gender equality in Rwanda.

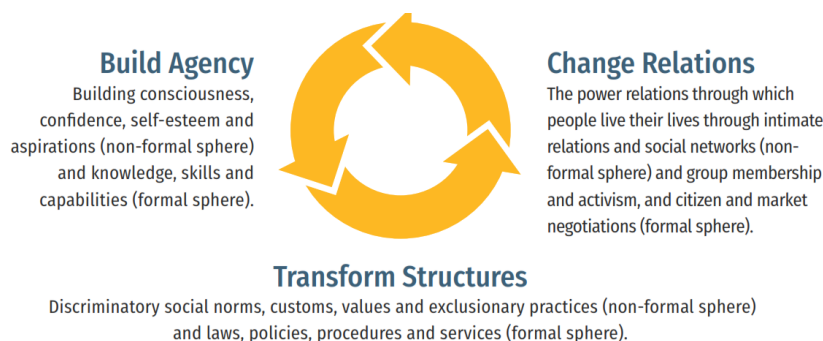
**The literature review encompassed information on gender and youth.** It involved examining publications that delved into both the national and regional contexts, along with literature exploring general gender dynamics in the sector from an international standpoint. The review also considered intersectional factors such as age, poverty, disabilities, or migration histories. It is important to note that there is a limited amount of literature specifically dedicated to intersectionality. Consequently, the review focused on publications explicitly addressing individuals with disabilities or refugees, aiming to concentrate, as much as possible, on the Rwandan context and the rural sector.

**In the field, we carried out ten focus group discussions with women's groups** across various locations, including Rulindo, Gakenke, Huye, Kayanza, Kirehe, Nyamagabe, and Nyabihu. In Kigali, we conducted key informant interviews with Pro-femme Twese Hamwe (PFTH), the Ministry of Gender and Family Promotion (MIGEPROF), and the National Union of Disability Organizations in Rwanda (NUDOR). Additionally, our consultants visited the Mahama refugee camp in Kirehe.

## CARE standards and guidance concerning gender equality and value chain analysis

**The methodological approach of this analysis is guided by the CARE Gender Equality and Women Voice Guidance Note** (CARE, 2019). CARE's approach to gender equality is outlined in three components: (1) strengthening gender equality and women's voice (GEWV), (2) promoting inclusive governance, and (3) increasing resilience.

**CARE developed a theory of change** that is up to date with current discourse on gender equality in agri-food systems. CARE's gender equality framework is based on three principles: Build agency, Change relations and transform structures (see Figure 29), distinguishing by non-formal and formal spheres.



**Figure 29: CARE's Gender Equality Framework**

Source: CARE 2019

**The SERVE project will be able to address a selected set of these principles.** The strategies for engaging young women in the selected value chains in the SERVE project will be structured along those principles. Moreover, the CARE Gender Equality and Women Voice Guidance Note and the CARE Gender Toolkit include valuable guidance and examples for putting gender equality into practice. Divided by four main areas (Strengthening Relationships & Solidarity Groups, Social Norms Change, Inclusive & Accountable Institutions, Leadership & Collective Action), the CARE Gender toolkit includes a wide range of examples and tools how a project takes up gender sensitive and transformative measures.

**In the Gender Equality and Women Voice Guidance Note, CARE puts a focus on collaborating with women and girls of all ages, fostering solidarity within their networks.** This involves reflection on gender roles and expectations they encounter (femininities) and acting for women's empowerment and gender equality. Similarly, CARE considers it as a key element to involve with men and boys to reflect on the gender roles and expectations they face (masculinities) and encourages action to transform oppressive gender norms, promoting gender equality. Additionally, CARE puts effort in working with groups experiencing multiple inequalities based on gender, class, caste, ethnicity, and ability, recognizing intersectionality to understand the interconnected nature of racism, ageism, sexism, and homophobia and how these factors continually influence each other. Following this approach, the gender analysis also focusses on women, including them at an early age, and puts efforts into taking an intersectional approach incorporating a diverse set of factors contributing to inequality.

**In addition to the Guidance Note and Tool Box provided by CARE, the gender analysis is also based on the sustainable food value chain (SFVC) approach developed by FAO (FAO, 2016).** The SFVC development cycle proposes three stages of analysis and development:

- The initial phase involves evaluating the performance of a value chain, considering its economic, social, and environmental outcomes.
- The second phase aims to comprehend the causes of underperformance by examining the interconnections among stakeholders and their activities within the sector and value chain. It explores how these connections influence the behavior of individual stakeholders, especially in commercial aspects, and how the determination of value in end markets shapes the system's dynamics.
- Finally, the third phase focuses on enhancing performance by formulating development strategies based on the analysis from phase two. It involves selecting upgrading activities and establishing realistic partnerships to achieve the envisioned impact scale.

The gender analysis focusses on the first two steps by reviewing respective literature and collecting field data. Eventually, the outcome of this analysis will lead to formulating strategies for a gender transformative approach.

## 9.2. Gender Analysis and Dynamics: Key Gendered Factors Affecting Young Women

### Context

**The government of Rwanda supports measures to enhance gender quality** in Rwanda and considers gender equality to be a central piece of the national development (Bigler et al., 2017). Among the measures to improve gender equality lies the objective to appoint 30% of all decision-making bodies to women<sup>106</sup>. Nevertheless, according to Rwanda's National Gender Strategy, representation of women across sectors remains low. Additionally, it remains unclear how gender-mainstreamed policies will reach rural communities (Bigler et al., 2017).

**The government of Rwanda has demonstrated a strong commitment to gender equality**, ranking first in Sub-Saharan Africa in the 2022 Global Gender Gap Index. The Rwandan constitution mandates at least 30% representation of women in decision-making roles. The government's Strategic Plan for Agriculture Transformation (2018-2024) recognizes gender disparities and seeks to empower women and youth in the agricultural sector. Several institutions have been established to support gender equality, but the lack of sex-disaggregated data and other obstacles persist. The government's commitments include equal rights, valuing women's unpaid work, promoting agricultural cooperatives, and ensuring equal access to resources and finance. Rwanda has made substantial progress in achieving gender parity, notably in its parliament where women now make up 61.3% of the legislative body.

**In agriculture, opportunities and productivity of women and men are still not equal.** The gender gap in agricultural productivity is related to multiple factors. Such factors may be the unequal access to agricultural inputs, lower returns on investments, a gender bias on the market, limited access to land and decision-making power and the division of work within the households (UN Women, 2019).

**The Agricultural Review indicates that there are more women than men who consider agriculture as their main livelihood activity.** Among those that count agriculture as main activity, between 63% and 58% are female.**Error! Reference source not found.** Table 41 provides an overview of agriculture as main activity per district. The ratio between the ten districts only varies by 5%. There is no information available concerning differences of representation of genders by value chain in the selected districts.

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<sup>106</sup> Constitution of the Republic of Rwanda 2003, as amended to 2015 ("women occupying at least thirty percent (30%) of positions in decision-making organs", Article 10).

**Table 41: Agriculture as main activity per district**

	Male		Female		Total
	Counts	Share	Counts	Share	
<b>Huye</b>	27.726	37%	46.489	63%	74.215
<b>Nyamagabe</b>	39.369	38%	63.326	62%	102.695
<b>Rubavu</b>	21.185	44%	26.467	56%	47.652
<b>Nyabihu</b>	26.277	38%	43.397	62%	69.674
<b>Rulindo</b>	38.077	36%	67.318	64%	105.396
<b>Gakenke</b>	57.352	39%	90.777	61%	148.128
<b>Rwamagana</b>	34.699	39%	53.505	61%	88.204
<b>Kayanza</b>	39.775	42%	54.353	58%	94.128
<b>Kirehe</b>	43.924	39%	67.400	61%	111.325
<b>Ngoma</b>	48.212	42%	66.715	58%	114.927
<b>Total</b>	376.596	39%	579.747	61%	956.344

### 9.2.1. Access and Control Over Resources for Youth and Young Women

#### Access to tenure, agricultural resources and training

**According to FAO (FAO, 2023), women still face challenges in accessing essential assets and resources within agrifood systems compared to men.** Closing these gender gaps involves successful strategies such as comprehensive interventions, collective action, and enhancing human capacities through training and extension services. Policies play a crucial role in creating an environment conducive to achieving a more equal distribution of resources. Evidence from approaches that have successfully reduced gender gaps in specific resources, such as landownership and extension services, provides valuable guidance for shaping policies, investments, and interventions in the agri-food system to promote equality and equity.

**The 1999 inheritance law granted women and men in Rwanda equal rights to inherit and own property** (Bigler et al., 2017). This was an important step in improving equal land rights and strengthening overall gender equality in Rwanda. The Rwanda Land Tenure Regularization (LTR) program further defined land rights and reduced gender bias in land ownership. This improved the access to land tenure and subsequent agricultural investment for married women. A statistics provided by RNRA indicates that 58.3% of



land is owned by married couples, 24% by women only and 14% by men only (Gender Monitoring Office (GMO), 2019).

**Nevertheless, FAO/WFP (Angelica Senders et al., 2020) suggest that tenure security for women is still lower in comparison to men.** Among society, men are still considered as the head of households and principal landowners, especially in rural areas. This leads to men exercising more control over property and land, impeding women's access to their equal land rights. Additionally, only women in monogamous marriages have legal claim on their husband's land. This means that about 60 % of women in Rwanda in non-formal partnerships do not have the access to the assets of their partners. This was confirmed by the field interviews, in which it was indicated that even if land is shared between a married couple, men dominate decision-making on the land.<sup>107</sup> It was mentioned that socially, the man is considered the head of the household.<sup>108</sup> During the field interviews, no instances of women exclusively owning land were mentioned, making it challenging to determine whether women would be recognized as decision-makers or if other family members would intervene. However, in certain interviews, it was noted that when projects or businesses were under the sole ownership of women, they assumed responsibility for and made decisions regarding tasks throughout the entire value chain.<sup>109</sup>

**An age-focused study in the neighboring country Uganda revealed a pronounced age-related disparity in land access and ownership** (Rietveld (Anne) et al., 2020). As younger generations, particularly young men, are poised to inherit land from their parents, a widening gap emerges between men and women. Despite constitutional equality, similar to the legal regulations in Rwanda, customary laws favor male land ownership, leading to increased vulnerability for women. Young people of both sexes consider it much harder for women to access land than for men, although it must be said that limited land availability in general is a problem in the wider East-African region. The study identified three distinct groups among young people: those without access to land, those with potential access through inheritance, and women with limited access unlikely to gain control due to gender norms. Economic deprivation resulting from limited land access is highlighted, particularly for women, impacting their likelihood of migration. While young men may overcome land disadvantages through jobs and savings, young women face more significant restrictions due to societal norms and limited opportunities for income generation. The age-related aspect of this issue is critical, as the inheritance dynamics among the youth contribute to the widening disparities in land access between genders.

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<sup>107</sup> Rwa\_2, RuL\_1, Kay\_3, Ngo\_5, Ngo\_7, Nyab\_3, Nyab\_4, Nyam\_5, Kir\_14

<sup>108</sup> Huy\_1, Huy\_7, Kay\_5, Ngo\_9, Rwa\_3, Nyam\_7

<sup>109</sup> Rwa\_5

**During a case study on the agricultural productivity in Rwanda (UNDP–UN Environment Poverty Environment Initiative (PEI), 2019), women had less access to farming materials and agricultural tools.** Furthermore, according to FAO/WFP (Angelica Senders et al., 2020), women in Rwanda have difficulties to access modern technology for farming, limiting them to enhance climate-resilient agriculture. How much access and control women have on agricultural resources is influenced by their marital status. Thus, widows and divorced women have greater access to agricultural resources and opportunities and tend to be economically more active compared to married women. On the other hand, they face greater food insecurities due to lower amounts of resources and restricted access to financial services (Angelica Senders et al., 2020). Unmarried youth, male and female, is often engaged in family farming with limited access to agricultural resources and technology limiting their opportunities to develop independent business opportunities. Yet, female youth face even greater barriers due to prevalent gender norms. Moreover, women with disabilities face even greater challenges in accessing agricultural resources as rural areas provide more difficult living situations. For instance, geography can be barrier, especially for people with physical disabilities, as mobility in hilly areas is more difficult for someone in a wheelchair. Women with disabilities are also more likely to suffer from poverty and to have low levels of education limiting their ability to participate in trainings and receiving extension services.<sup>110</sup>

**The field interviews revealed that women are involved more in the value chains that need less investment, meaning lower risk for them, and they often have less access to financial resources for investments.** They are usually also those value chains that can help sustain their families. Those commodities that women are involved in are usually easier to be combined with those activities expected to be done by women due to social norms (e.g. household activities, taking care of children etc.). Which value chains provide lower risks and allow a balance of home responsibilities may depend on the districts and communities, as well as personal preferences. A women group in **Rulindo** stated: “In general women focus on vegetables because of low cost for investment and takes a shorter period for production. However, vegetables require consistent follow up, and this is mostly done by women in this area. Cash crops commodities like banana, Irish potatoes are mostly in the responsibilities of men.” (VSLA Women group, personal communication, November 13, 2023)<sup>111</sup>. They furthermore pointed out that in their district, “Women can participate in vegetables farming because it gives profit in short period and it doesn't require much investment.” (VSLA Women group, personal communication, November 13, 2023)<sup>112</sup>.

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<sup>110</sup> Kig\_11

<sup>111</sup> Ru\_1

<sup>112</sup> Ru\_1

In **Naybihu** district, a women group indicated that women “mostly involve in staple crops production like maize, beans, sweet potatoes, Irish potato and wheat etc.” (Women Group Tomato, personal communication, November 27, 2023).<sup>113</sup>

In **Rubavu** district, women producers involved in tomato production claimed that “The reason women focus on vegetables is that they are crops that require a lot of supervision, being close to these crops, take care of them and these tasks are usually not difficult; therefore, women are more able to tolerate and keep up with small but routine daily tasks than men. And they are often harvested several times that they generate minimal income but frequently from the harvest to the end of harvesting, helping them to meet the needs of households. In addition to these conditions, these crops do not require high financial capacity; those without the money can grow on a smaller area due to capacity and develop over successive years.” (Women producers tomato value chain, personal communication, November 28, 2023).<sup>114</sup> Mentioned vegetables were tomato and egg plant.

While in Rubavu district, tomato production was considered suitable for women, in **Kirehe** district, the tomato value chain was not popular among women. As a reason interviewed women group in Kirehe stated that “growing tomatoes requires applying pesticides more times which is in possibilities of men when it comes to carrying and lifting pumps and water pipes. The tomato farm also requires to be visited every day. The woman overloaded with home activities doesn’t have this time of every visit.” (Women Group Kirehe, November 17, 2023).<sup>115</sup>

In **Kayanza** district, an interviewed women group stated that “the woman prefers owning poultry farm because of dominant value chain activities like recurrently cleaning and feeding performed by the woman than the man. When the man is undertaking these kind of lasting activities without obvious change/progress he is bored whereas the woman is not.” (Women Group Kayanza district, personal communication, November 14, 2023)<sup>116</sup>. Also, in **Huye** district, a poultry producer stated that “Poultry farming is a good activity [for women] because it can be combined with other household activities like caring children.” (Poultry producer, personal communication, December 4, 2023)<sup>117</sup>.

Men are more involved in income-generating activities, however, often also have the responsibility of paying certain bills, such as school fees. Further barriers mentioned that

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<sup>113</sup> Nyab\_4

<sup>114</sup> Rub\_10

<sup>115</sup> Kir\_7

<sup>116</sup> Kay\_2

<sup>117</sup> Huy\_5

make the access to certain value chains by women difficult are lack of specific skills, time constraints, geographic barriers that only allow the growth of some products.<sup>118</sup>

The field interview in Kirehe showed that refugees participate in agricultural value chains mostly through labor provision, as they often do not own their own lands. Some have kitchen gardens inside camps to grow their own vegetables.<sup>119</sup> This was affirmed in an interview with a group of refugees at Mahama Refugee Camp, who indicated that they lack ownership of land for constructing chicken pens. Additionally, establishing a farm within the camp is prohibited, regardless of the absence of available space.<sup>120</sup> People with disabilities also participate in some steps of different value chains (e.g. poultry, french beans and chili), depending on their disabilities. The type of disabilities prevalent in Kirehe are physical, mental and sensory (unable to hear or speak). However, it was stated they mainly needed financial support as they often struggle with poverty.<sup>121</sup> In this context, NUDOR stressed that the participation of individuals with disabilities in the agricultural sector is limited. It is not a lack of interest on their part, but rather the agricultural sector itself that lacks inclusivity. If individuals with disabilities were equipped with the required materials, they could demonstrate their capabilities. In the absence of accessible materials, their tasks were limited to simpler activities. While disability may create barriers, addressing these obstacles would enable them to perform on par with others. The key lies in mitigating the barriers associated with disability to unlock their full potential.<sup>122</sup>

**Gaining access to training and extension services proves to be particularly challenging for female refugees.** In consultations at the Mahama refugee camp, a group of poultry producers emphasized the insufficient skills among refugees concerning poultry farm management, including shelter construction, equipment handling, and disease management. To fully capitalize on the opportunities within poultry farming, women need comprehensive training in poultry farming skills and self-confidence, coupled with support to access small loans. This generally applies to women, but especially to young females as they face even greater challenges in accessing loans and often lack confidence in their farming skills. Additionally, the producers highlighted challenges such as high production costs, insufficient training on poultry farm management—especially regarding disease control—and a lack of guidance on cost-benefit analysis.<sup>123</sup>

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<sup>118</sup> Kay\_2, Gak\_6, Gak\_7, Kir\_7, Nyab\_4, Rul\_1, Rub\_10

<sup>119</sup> Kir\_7

<sup>120</sup> Kir\_9

<sup>121</sup> Kir\_7

<sup>122</sup> Kig\_9

<sup>123</sup> Kir\_9

**In terms of access to agricultural support and extension services, different women groups report that they received support** to develop their commodities and to improve their access to agricultural value chains and resources. However, different districts report about different types of support. Many of the interviewed women groups report about female farmers receiving training, such as for the development of agricultural practices, the use of modern agricultural technology, quality control and marketing. Through cooperatives and farmer facilitators, the training can be easier accessed in some regions (Nyabihu, Gakenke)<sup>124</sup>. Female farmers also often receive agricultural resources, such as seeds, fertilizers, pesticides, etc., from different partners. However, some also report that there are still barriers to such training and resources, for example because of limited time due to household activities. In some districts, the general level of support for female farmers is still low (Kirehe, Rulindo)<sup>125</sup>.

In Kirehe, women farmers reported that the number of female farmers who receive agriculture support is still low. As women are overloaded with home activities, they do not get time to attend training for commodity development and quality control.<sup>126</sup>

In Kayonza, an interviewed women group reported that “Women always are constrained by household workload which include cooking, cleaning, feeding animals, caring children... this household workload limit woman's availability to participate in training.” (Women Group Kayonza district, personal communication, November 14, 2023)<sup>127</sup>. In order to reduce the workload, it was mentioned that a “solution to [relieve] woman from household workload should [be] local child care facilities like nurseries. Often, there is no means to do so, the alternative are village based ECDs (Early child care) which are under establishment.” (Women Group Kayonza district, personal communication, November 14, 2023)<sup>128</sup>. Also, in Gakenke district, the desire for receiving agricultural training was demonstrated.<sup>129</sup> A women group in Gakenke pointed out that child care facilities are necessary when providing training: “Currently, child care services are provided for children above 2 years old, and we [need] this for children under 2 years old” (Women Group Green Beans Gakenke, personal communication, November 7, 2023)

Women may also face difficulties access training opportunities when training facilities are not located closely to women's home and no transport is provided.<sup>130</sup> In Kirehe

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<sup>124</sup> Nyab\_4, Gak\_7

<sup>125</sup> Kir\_7, Ru\_1

<sup>126</sup> Kir\_7

<sup>127</sup> Kay\_2

<sup>128</sup> Kay\_2

<sup>129</sup> Gak\_6

<sup>130</sup> Kay\_2, Kir\_7

district, an interviewed women group stated that “Some training which can’t provide facilitation and transport for trainees are not attended by women because there is no compensation of household activities suspended” (Women Group Kirehe district, personal communication, November 17, 2023).<sup>131</sup> A women group of tomato producers furthermore suggested that if the trainings is located further away “women should be provided with special transport facilities and accommodations, and they should be provided with hygiene and sanitation facilities and arrange where those who have children can keep them safe” (Women Group Tomato in Nyabihu district, personal communication, November 27, 2023).<sup>132</sup>

**In order to facilitate the production of goods by women in the agricultural sector, the interviewed women groups predominantly suggested to improve the access to physical and non-physical resources.** Better access to agricultural resources such as good seeds, good fertilizers, modern technology and machines (including for risk assessment and climate change adaptation), better access to financial resources, such as loans and investment capital and non-physical resources such as training were mentioned to guarantee better production. Groups from different districts also suggested that the organization into cooperatives may help improve such access.<sup>133</sup>

## **Access to financial resources**

**Agricultural credit plays a crucial role in augmenting available resources for agriculture throughout its value chains.** It not only enhances or establishes alternative employment opportunities for both women and men within the production and supply chains but also addresses the inherent limitations in the agricultural credit sector. This limitation primarily stems from the sector’s heavy reliance on unpredictable weather patterns. To overcome this challenge and promote sustainable income generation in agriculture for both genders, investments in climate change management are essential. Introducing gender-friendly mechanisms further contributes to the resilience of men and women in sustaining their incomes through agricultural activities. Additionally, there is a pressing need to implement specific measures that encourage more women to actively seek and apply for agricultural loans. The National Bank of Rwanda published data showing that female still lack behind in accessing formal finance. In 2015, 74.5% of the provided loans were given to men, while only 25.5 was provided to women (Gender Monitoring Office (GMO), 2019).

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<sup>131</sup> Kir\_7

<sup>132</sup> Nyab\_4

<sup>133</sup> Kay\_2, Gak\_6, Gak\_7, Kir\_7, Nyab\_4, Rul\_1, Rub\_10

**The field interviews indicated that especially young women lack access to agricultural loans and formal financial services.** The predominant reason that explains the gap between women and men when applying for and receiving a loan is the lack of collateral. Difficulties for young women to access land and property also limits their ability to have collateral, as usually land and houses are given as collateral when applying for a loan. Young men may inherit land from their parents, while married women may use household properties as collateral. However, in the case of young women, they often do not have fixed assets (such as house and land) which they could give as collateral.<sup>134</sup>

**When assets are shared between a woman and a husband, the decision-making on the collateral generally lies with the husband.**<sup>135</sup> Since the prevailing social norms regard the husband as the head of the household, even if land and property are shared, there is no guarantee that they can be used by the women for collateral. Additionally, while men may overcome economic disadvantages through paid jobs, women are socially expected to stay at home, doing not remunerated household work.<sup>136</sup> This makes it even more difficult for women to acquire the necessary pre-requisites for loans and guarantee investments for their agricultural practices.

**Various farmers', women's and youth groups in the districts reported that youth and women often feel insecure when they want to apply for a loan,** as they know they will be rejected without necessary collateral.<sup>137</sup> In Huye district, respondents from a farmer group said that “the barrier that women and youth can face, but especially youth, is the lack of collateral. This often causes youth to not even try to apply for a loan, because they know for sure that they don't have the key requirements” (Poultry Producer Huye district, personal communication, December 4, 2023)<sup>138</sup>

Additionally, youth and women may be afraid to invest in agriculture due to the high chances of loss.<sup>139</sup> Referring to entry barriers in the sector for women and youth, a female retailer of pineapple in Gakenke district highlighted that women and youth “...are afraid of loss. Actually, they do not like to take the risk” (Pineapple Retailer Gakenke, personal communication, November 15, 2023)<sup>140</sup>. A financial institution in Gakenke confirmed that a challenge in providing agricultural finance to women and youth is that “youth and women are afraid of taking loan to invest in agriculture due to the afraid of

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<sup>134</sup> Huy\_3, Rub\_4

<sup>135</sup> Huy\_1, Huy\_7, Kay\_5, Ngo\_9, Rwa\_3, Nyam\_7

<sup>136</sup> Kay\_4

<sup>137</sup> Gak\_1, Gak\_7, Gak\_11, Huy\_3, Rub\_4, Kay\_3, Kir\_11, 12, 13, Ngo\_5, Nyab\_1, Nyab\_4, Rwa\_7, Nyam\_5, Rub\_8, 9, 10

<sup>138</sup> Huy\_5

<sup>139</sup> Gak\_1, Gak\_5

<sup>140</sup> Gak\_5

loss" (Financial institution Gakenke district, personal communication, November 14, 2023).<sup>141</sup> They claim that this is due to the lack of entrepreneurial skills.

As female youth (and youth in general) often do not have the necessary savings to access loans, they are trusted less by financial institutions.<sup>142</sup> Additional to high loan requirements, high interest rates, unsuitable financial products and the long waiting time for loan provision make the access to loans for women and youth even harder<sup>143</sup>. Young women also often do not receive the necessary information of where they can access loans.<sup>144</sup> **Formal financial institutions, such as banks, are mainly used by women between the ages of 30 and 50 that have regular incomes.** Nevertheless, informal financial services continue to play an important role, as around 53% of women use non-bank financial institutions (NBFIs). Especially young women rely heavily on informal finance, as they face greater difficulties to access formal financial services, often due to lower education levels and limited information on financial services (Angelica Senders et al., 2020).

While men primarily use financial services for investing in their businesses, women use such services for the household and food security. The field interviews revealed that the types of commodities preferred by women are those that contribute to food security. Although it was not clear from the interviews whether financial services were used by women for food security, the preference for food security crops suggests that financial services are also utilized to produce such crops. In **Gakenke**, women involved in green bean farming pointed out that "Mostly women are still focusing on those commodities that can feed their families, while men are focusing on those commodities can generate more revenues." (Women Group Green Beans, personal communication, November 7, 2023)<sup>145</sup>. It was added by another women group in Gakenke, that women tend to "sell part of them [the commodities] in order get money to save in the tontines like sweet potatoes, while men are mostly focusing on those commodities can generate more revenues like bananas, forests and horticultural crops" (GWomen Group Fruits, personal communication, November 26, 2023).<sup>146</sup>

The services that women prefer to use are saving products and loans. According to Angelica Senders et al. (2020), financial services such as mobile money or insurance are used less by women. However, during the field interviews, women groups and individual female producers, as well as youth groups from the different districts reported using financial services other than banks, such as mobile money services for saving,

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<sup>141</sup> Gak\_1

<sup>142</sup> Gak\_5, Gak\_13

<sup>143</sup> Gak\_6, Rwa\_4, Rwa\_5, Rwa\_8

<sup>144</sup> Gak\_7

<sup>145</sup> Gak\_6

<sup>146</sup> Gak\_7



withdrawing and transferring money.<sup>147</sup> However, it was mentioned that not all women have access to a mobile device and that mobile money brings challenges such as fraud and unstable networks.<sup>148</sup>

Especially popular among interviewed women across districts were Voluntary Saving and Loan Associations (VSLA) and other types of informal saving groups. Most women reported on being part of a VSLA or saving group and had predominantly positive experiences. Informal saving groups can improve women's access to loans, as within saving groups collateral is usually not required. VSLA thus contribute to women's economic development.<sup>149</sup> Many of the interviewed women preferred acquiring loans through informal saving groups instead of formal financial institutions, such as banks. In **Kirehe** district, an interviewed women group indicated that within VSLAs, "getting loans doesn't take long time and there is flexibility on repayment intervals. Compared to financial institutions loans, VSLAs' loans are the bests." (Women Group Kirehe, personal communication, November 17, 2023)<sup>150</sup>. A female retailer of green beans in **Gakenke** district stated that "informal savings do well as they provide loans without the collateral and members trust one another as they live together in the community" (Retailer of green beans Gakenke, personal communication, November 26, 2023).<sup>151</sup> A Women Group in **Kayanza** stated: "When compare it to Umurenge SACCO, loan service in VSLA is better and fast than in SACCO Umurenge which complicated terms and conditions to access and more charges when you reach it. VSLA also doesn't require membership fee which can limit some persons." (Women Group Kayanza, personal communication, November 14, 2023).<sup>152</sup> Also, some doubts were raised about informal saving groups. In **Gakenke** district, a women group mentioned that "In the beginning these informal saving groups were working effectively. But, nowadays some group leaders steal our savings." (Women Group Gakenke, personal communication, November 7, 2023).<sup>153</sup>

**Securing financial services and seeking investments poses an even greater challenge for female refugees.** Particularly, refugee youth women engaged in farming lack the necessary investments or established operational businesses that are typically required as collateral for loans or other forms of support. Noteworthy initiatives such as Pro-Femme, Maison shoom and CARTAS aim to empower women through vocational training and savings groups. By accumulating funds through these initiatives, women can enhance their savings and embark on new income-generating activities like

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<sup>147</sup> Gak\_6, Gak\_7, Gak\_11, Huy\_5, Huy\_6, Nyab\_4, Nyam\_5, Rub\_9, Rub\_10, RuI\_1

<sup>148</sup> Huy\_5

<sup>149</sup> Gak\_6, Gak\_7, Gak\_11, Huy\_5, Huy\_6, Nyab\_4, Nyam\_5, Rub\_9, Rub\_10, RuI\_1

<sup>150</sup> Kir\_7

<sup>151</sup> Gak\_11

<sup>152</sup> Kay\_2

<sup>153</sup> Gak\_6

trading and farming. However, a major obstacle remains the requirement of an existing business as collateral, making it seemingly impossible for refugees to initiate a new business without external support.<sup>154</sup>

**A general interest in providing funding opportunities for women and youth exists.** This was reported by a financial institution that was interviewed in the district of Kirehe.<sup>155</sup> Providing such funding opportunities increases the financial institutions' potential for partnerships and new clients. However, they pointed out that mobilization is necessary, as many young women lack self-confidence and are not aware of the financial opportunities that exist. Young women may not feel confident and ready to work with formal financial institutions.<sup>156</sup> Thus, bottlenecks regarding financial literacy, collateral, as well as social norms limiting women to participate in certain activities and decision-making must be addressed.<sup>157</sup>

More detailed assessments of gender and financial services can be found in Chapter 0 of this report.

### 9.2.2. Gendered social norms (expectations, traditions, family dynamics/impact of family members, double work burden, etc.)

**Gender norms are unspoken societal guidelines shaping the roles and behaviors of women and men.** These norms significantly impact opportunities in agricultural production, commercialization, and innovation. Rooted in tradition and culture, they are dynamic and subject to change, often influenced by factors like technology and new ideas. Divergence from dominant norms, triggered by these factors, can lead to normative shifts. In agriculture, gender norms affect farming practices, while agricultural innovation reciprocally influences gender norms (Rietveld & Farnworth, 2018).

**Deep-seated social norms and rules perpetuate gender inequality, particularly in agriculture.** Slow to evolve, these norms impact attitudes toward women's work in agrifood systems and tolerate gender-based violence. Despite evidence supporting the broader empowerment of women, many restrictive norms persist. Overcoming these barriers and changing ingrained rules not only benefits women's well-being but also yields positive outcomes for society at large. This approach brings substantial co-benefits to women's livelihoods, earnings, and the health and nutrition of their children (FAO, 2023).

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<sup>154</sup> Kir\_9

<sup>155</sup> Kir\_14

<sup>156</sup> Nyam\_4

<sup>157</sup> Kir\_14, Nyab\_3

## Social norms at household level

**A UN Women Policy Brief on the Gender Gap in Agricultural Productivity in Sub-Saharan Africa identified that women with larger households tend to do more unpaid care and domestic work** (UN Women, 2019). The double burden of household duties and agricultural activities reduces the time and resources that women have available (Angelica Senders et al., 2020). Additionally, based on societal views, men are still considered to be the main decision-makers within families. This means culturally women face greater challenges to make decisions on earned income. Nevertheless, research shows that it can be advantageous for the health and education of children, if women are responsible for managing household income. Yet, research reveals shifting norms at varying rates, with positive implications for women's decision-making power in the home, despite persistent challenges. Traditional gender roles, particularly the husband's status as the "head" of the household, remain a cornerstone of inequality. The ideal husband is viewed as a provider and role model, tasked with major decision-making. Men's freedom of movement is largely unrestricted, and they have authority over household matters. Gender-based violence persists, with cultural expectations around discipline (Rietveld & Farnworth, 2018).

**The field interviews indicated that for women decision-making about production, land and income may be impeded due to social norms giving the husband more power to make decisions.** Many districts reported that decision-making power generally lies with the husband, even if an agricultural project is shared.<sup>158</sup> As men are socially considered to be the head of the household, certain decisions are taken whether or not women agree or disagree, contributing to conflicts in the household.<sup>159</sup>

**Social relations do have a significant impact on the livelihood choices and opportunities of young men and women: While young men appear less influenced by relationships and family responsibilities, young women face distinct challenges.** The narratives of young women often involve issues related to pregnancy, having children, domestic violence, and financial dependency on men. Societal expectations for women to prioritize finding a husband, raising a family, and being under their husband's authority, rather than pursuing professional or economic fulfillment, play a significant role in shaping these dynamics. If young women rely on men for financial support, it indicates a challenge in their ability to independently access or generate sufficient income. Moreover, even if they manage to do so, there is a risk of being easily deprived of control. This situation is connected to the comparatively limited resource base for women, for instance in relation to land. Contributing factors include gender norms that discourage

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<sup>158</sup> Rwa\_2, Ru\_1, Kay\_3, Ngo\_5, Ngo\_7, Nyab\_3, Nyab\_4, Nyam\_5, Kir\_14

<sup>159</sup> Kay\_4, Nyab\_4, Rub\_10, Nyam\_5

independent commercial activities, particularly in farming (Rietveld (Anne) et al., 2020). These social norms may also for barriers for women's participation in potential SERVE project activities. When project activities are formulated, potential barriers related to social relations should be considered. Project staff should be trained on gender issues and the project design and monitoring should be elaborated to address and monitor gender-related barriers. **Social norms can impact women with disabilities even more than others as many experience multiple disadvantages** due to gender, facing a lack of agency within the household, enduring discrimination for being a person with disabilities, and grappling with societal and familial neglect, resulting in being marginalized and left behind. NUDOR further emphasized that female persons with disabilities encounter greater challenges compared to their male counterparts. For instance, women with albinism often face difficulties in finding a life partner, whereas men with albinism typically do not encounter the same obstacles in forming a family. Challenges extend to sexual reproductive health, with females experiencing distinct disadvantages. Alarming rates of abuse and rape are prevalent among female persons with disabilities, far surpassing the incidence observed among their male counterparts.<sup>160</sup>

## Social norms in the field

**Notably, expectations for women have changed rapidly over the past decade, challenging traditional roles.** Women were historically confined to domestic responsibilities, but societal norms are evolving, allowing women more economic participation and mobility. While women's freedom is expanding, challenges remain, and gender-based norms continue to influence women's mobility and decision-making autonomy. Despite some changes, the norm of the ideal husband has not significantly shifted over the past decade. Men continue to enjoy certain freedoms, including the ability to discipline their wives, contributing to prevalent gender-based violence. Yet, the normative expectations for women have evolved more rapidly. A decade ago, women were confined to the house, engaged in unpaid domestic work, and faced restrictions on economic activities. Even working on other people's farms was done in secret due to societal disapproval. While women's mobility is still largely controlled by husbands, there is a slow but noticeable change. Young women today experience more mobility than their counterparts a decade ago, although complaints about restrictions persist. Women's freedom of mobility tends to increase as they grow older (Rietveld & Farnworth, 2018). **Gendered norms and customs still influence how unpaid work in the household is divided and what type of labor is allocated to women in the marketplace.** Men, as household heads, retain their primary role as land managers, assigning wives plots for food crops. While women assist with crop management on "family" land, certain tasks like weeding are

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<sup>160</sup> Kir\_9

female-dominated. Women's access to inputs relies on their husbands. Crops like bananas are deemed exclusive to men, with income from sales going entirely to them, despite women contributing significantly to production. Women's crops, grown without external inputs, face low productivity due to traditional norms emphasizing women's role in household food satisfaction, leaving financial management to men (Rietveld & Farnworth, 2018).

**Yet, while men, in their function as household heads, are still considered the primary managers of land. women's roles and responsibilities are undergoing changes, with an increasing number of women gaining economic independence from their husbands.**

One notable shift is the growing prevalence of women selling part of their produce, engaging in petty trade, selling surplus food crops, and participating in casual farm labor to earn a small income. The emergence of opportunities for women to receive or access agricultural inputs directly, often facilitated by nonprofit organizations or agro-dealers, contributes to their economic empowerment. The presence of savings and credit organizations in the area further supports these changes. This economic independence potentially allows women to invest in enhancing the productivity of their crops and may encourage them to engage more actively in cash cropping over time (Rietveld & Farnworth, 2018). **A gendered division of labor was confirmed during the field consultations.** The women's group interviewed in Gakenke explained that women take a large part in decision making regarding seed selection, land preparation, planting until the harvesting stage. Men take responsibilities and decisions for the stages from transporting, marketing, and selling their produce.<sup>161</sup> Yet, the situation seems to be different depending on the value chain and the region. In Kirehe, the Women's Group stated when commodity is in the responsibility of woman, she is responsible for the whole production chain unless her responsibility is limited to labor input. When the woman is the owner of the farming project, her responsibility continues from production over processing and transport, to marketing and selling.<sup>162</sup> The focus group discussion in Rulindo, in comparison, showed a mixed picture of labor division: Women can take the responsibilities for the whole value chain, but their concentration is at production and retail levels. They are less involved in processing and transport or marketing. Men can take all responsibilities from production to marketing but both men and women work and supporting each other along the value chain.<sup>163</sup> In summary, in most districts, respondents said that women are responsible for big parts of the value chain. However, the involvement of women tends to be higher in activities around production (planting, weeding etc.) and less around transport, marketing and selling of the product - which is often in the responsibility of men. Similar to Rietveld & Farnworth (2018), this suggests that profit-

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<sup>161</sup> Gak\_6

<sup>162</sup> Kir\_7

<sup>163</sup> RuI\_1

oriented activities and financial management are still predominantly under the control of men.

In Nyabihu district, it was reported that young women are culturally expected to do certain tasks, such as planting and weeding, as those tasks do not require as much effort and physical strength<sup>164</sup>. Women seem to be supported by men throughout the value chain, often regarding physically difficult labor. Other barriers seem to be lack of access to investment and decision-making power over income. This tends to be in the responsibility of the men. In some districts and value chains (see Kirehe, Gakenke) respondents claim women are responsible for the entire value chain.<sup>165</sup> Some agricultural projects and businesses in different districts were reported to be owned by women. In Rwamagana district, a female poultry producer was interviewed that stated that the whole project is owned and managed by her and that all activities along the value chain are suitable for women. It was mentioned that "It has been a good practice for the woman who remains at home whereas, the husband is on work. The project increased the complementarity between wife and husband in terms of satisfying all family needs." (Poultry farmer Rwamagana District, personal communication, December 7, 2023).<sup>166</sup> The interviewee also stated to feel confident managing the project and would be interested in training other women who may have not reached the same level yet that she has reached.<sup>167</sup>

**A study focusing on Rwanda's Northern Province reveals a gendered rural labor market, with more women than men in subsistence farming, casual on-field agricultural work, and domestic roles.** This aligns with existing literature, indicating a feminization of labor in agriculture, particularly in low-paying jobs. The findings echo patterns observed in other regions, emphasizing a gender-wage gap and precarious working conditions for women. Casual on-field agricultural workers, identified as the poorest group, face challenges due to limited land ownership and are not benefiting from current agricultural policies. This situation exacerbates local disparities. The slow adaptation of the labor market to include landless individuals further compounds these challenges (Bigler et al., 2017).

**Gendered social norms directly impact women's productivity in the agricultural sector and the access to profits** (UN Women, 2019). Furthermore, women tend to focus on subsistence agriculture, and often receive less return for their agricultural produce due to a gender bias in produce markets (Angelica Senders et al., 2020). Men often receive a higher return for the production of high-value crops (UN Women, 2019). FAO/WFP

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<sup>164</sup> Nyab\_1

<sup>165</sup> Kay\_2, Gak\_6, Gak\_7, Kir\_7, Nyab\_4, Ru1\_1, Rub\_10

<sup>166</sup> Rwa\_5

<sup>167</sup> Rwa\_5

suggest that for women it may be unfavorable to have a higher income than their husband, as this can lead to conflict and violence at home (Angelica Senders et al., 2020).

**Despite resistance, changes in women's economic roles challenge norms.** Women increasingly engage in petty trade, selling surplus crops, and accessing agricultural inputs directly. Economic independence and participation in cash cropping may strengthen over time (Rietveld & Farnworth, 2018).

## **Lower levels of violence and women's increasing freedom to move and decide**

**While traditional norms still designate men as household heads and primary decision-makers, there is a consensus that women now actively participate in decision-making.** In discussions, poor women note that a good husband allows his wife to express her views. Following the 1994 genocide, women assumed crucial roles as providers and decision-makers during men's prolonged absence. Upon their return, women resisted reverting to submissive roles, expecting consultation. Gender-based violence significantly decreased, supported by legal protection. Many men now recognize the harm caused by domestic violence.

**Women's increased freedom includes participation in community activities, attributed to government policies and efforts by NGOs and civil society organizations.** Empowerment initiatives have heightened gender awareness and women's self-confidence. Women have gained autonomy in decision-making, especially regarding expenditures. While women can make small purchases independently, larger decisions typically involve informing or obtaining consent from their husbands (Rietveld & Farnworth, 2018).

**Despite lower levels of reported violence, interventions on community level challenging social norms need to be chosen carefully to not cause any unintended risks of conflicts.** In the **Gakenke** district, a women group reported on some families in their district prohibiting the women to harvest crops like banana in the absence of the man. They also pointed out that some female farmers are not allowed by their husbands to engage in profitable activities.<sup>168</sup> In the **Kayanza** district, a women group reported that existing social norms especially impact young single girls who may not be allowed to leave their homes for business practices. Instead, they are expected to stay home until getting married.<sup>169</sup> A women group in **Nyamagabe** district stated that a businesswoman traveling may not be trusted by the husband, causing potential conflicts at home. Therefore, capacity building should be designed inclusively, capacitating both women and

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<sup>168</sup> Gak\_7

<sup>169</sup> Kay\_4

men.<sup>170</sup> In the districts **Huye** and **Nyamagabe**, government officials reported on the present cultural discrimination in decision-making regarding household farming and assets (e.g. land).<sup>171</sup> In the district Nyamagabe, it was reported that a policy and skill gap is visible regarding the promotion of gender equity and addressing gender-based violence in agricultural settings.<sup>172</sup>

Pro-femme Twese Hamwe (PFTH) currently implement the campaign “16 days of activism against gender-based violence” and supports the program “Journey of Transformations” which intends to engage men and boys on topics of negative masculinity.<sup>173</sup> A government official in Nyabihu district mentioned that trainings are held in their district about gender equality and gender-based violence by the Ministry of Gender and Family Promotion (MIGEPROF).<sup>174</sup> MIGEPROF's objectives and strategies are related to interventions on community level, such as to address issues like the women's lack of control over household finances. Such interventions intend to challenge stereotypes and align with Rwanda's national gender policy objectives.<sup>175</sup> Mentioned initiatives may exhibit entry points for the SERVE project.

### 9.2.3. **Young women's agency, bargaining power, personal aspirations, and access to decision-making**

**Agency refers to individuals' capacity to discern their objectives, make decisions, and subsequently take action, manifesting through various forms like negotiation, bargaining, or resistance.** Women, in particular, wield agency across diverse domains, whether as individuals, collectively, within familial contexts, or through active involvement in formal and informal networks, markets, and politics. Within agrifood systems, measuring agency often involves assessing women's self-reported ability to engage in intrahousehold decision-making—such as determining land use or managing household income—as an indicator of their bargaining power. Examining agency within agrifood systems also highlights its role in enabling women to assume more substantial roles in governing value chains. This ensures they are not marginalized from critical negotiations and actions that facilitate enhanced market access (FAO, 2023).

**Since the enactment of the 2003 constitution which includes a gender quota for decision-making bodies, the representation of women in decision-making spaces has increased.** In Rwanda's parliament, 61.3% of the legislative body is held by women. This

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<sup>170</sup> Kay\_4, Nyam\_5

<sup>171</sup> Huy\_1, Nyam\_7

<sup>172</sup> Nyam\_3, Nyam\_6

<sup>173</sup> Kig\_7

<sup>174</sup> Nyab\_3

<sup>175</sup> Kig\_9



has enhanced both representation and power for women in Rwanda, especially in urban areas. Also, in rural area an improvement can be observed, as more women participate in unpaid governmental positions. This has given women in rural areas more respect, however, also means additional work.

## **Women's participation in agricultural sector**

**To strengthen women's participation and representation in the agriculture sector, Rwanda's Ministry of Agriculture and Animal Resources (MINAGRI) developed their fourth Strategic Plan for the Transformation of Agriculture (PSTA 4)**(Strategic Plan for the Transformation of Agriculture (PSTA 4), 2018). This strategic plan also considers Youth and presents measures such as the promotion of profitable engagement in agriculture and training on agricultural and entrepreneurship skills for Youth to improve their integration in the sector. The creation of institutions such as the Ministry of Gender and Family Promotion (MIGEPROF), the Gender Monitoring Office (GMO), and the National Women's Council (NWC) aim to support the implementation of gender-related policies(Angelica Senders et al., 2020).

**However, a study commissioned by the Food and Agriculture Organization (FAO) and the World Food Programme (WFP)(Angelica Senders et al., 2020) recognized the lack of data on gender mainstreaming in agriculture.** Additionally, they identified further barriers for effective integration of women in the agricultural sector and beyond, such as limited capacities for gender-sensitive planning, budget constraints for women's empowerment and insufficient female advisory staff. Women continue to face challenges related to voice and agency, marked by disparities in decision-making, work responsibilities, asset control, and contributions to community activities. To address the gender decision gap and enhance agricultural productivity, it is recommended to promote innovative time-saving technologies and gender-inclusive financial products, challenging gendered cultural norms, and extending agricultural extension services to both household heads and spouses (Rosenbach et al., 2023).

**During the field interviews women groups indicated how their agricultural productivity can be enhanced.** According to the women in **Huye** district, production can be facilitated and made more efficient if they are provided with training on specific agriculture value chains, financial support from banks, donors and partners, technological support, like machines for drainage, irrigation and pesticides, as well as telephones to help them improve their access to climate forecasts. Additionally, they emphasized the importance of encouraging women to access extension services such as Smart Nkunganire system, Twigire, Muhinzi, provided by agrodealers, farmer promoters and

FFS facilitators.<sup>176</sup> In Huye, a distinction was made between older and younger women. Although young women may need to same aforementioned support, they need additional support to take care of their children, such as affordable childcare facilities for the time they execute farm activities. Additionally, same rights on land and decision-making on household income need to be guaranteed to young women, as well as receiving assets for collateral.<sup>177</sup> In the district of **Nyabihu**, a women group expressed their desire to have trainings organized on village level and if not possible that women are provided with transportation, accommodation, hygiene and sanitation facilities, as well as arrangements to keep their children safe and guarantee the effective participation of the women.<sup>178</sup> In **Nyamagabe** district, representatives of the women group stated that to facilitate production, they need mechanization technologies that can help them replace traditional agriculture. Furthermore, they need better access to agricultural materials, such as pumps, watering cans and boots, as well as post-harvest facilities, such as cold rooms to reduce production losses. Similar to the women in Huye, in Nyamagabe interviewed women stated that smart phones would help them receive information about the climate forecast, as well as improve their information access on markets, pests and diseases.<sup>179</sup> Gathering in cooperatives may help them afford the type of equipment for mechanization.

**The promotion of self-organization within cooperatives or producers groups can empower women and enable decision-making power.** All interviewed women groups saw advantages in organizing themselves into production cooperatives. The main advantages they saw were in regard to improving the access to financial and agricultural resources (e.g. loans, seeds, etc.), as well as training and peer learning. Through sharing experiences in cooperatives, they believe that the general knowledge of female farmers in various domains, including agriculture, health, gender equality, self-employment and empowerment can be improved and their confidence can be enhanced.<sup>180</sup> Through collective trainings, individual businesses can be improved through adopting best practices and considering lessons learned from other female members within farmer and producer cooperatives.<sup>181</sup>

**During a focus group discussion in Rulindo it was brought up that the joining or formation of groups can be difficult for people with disabilities.** It was mentioned that sometimes people with disabilities do not associate with others due to lacking self-confidence, they

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<sup>176</sup> Huy\_6

<sup>177</sup> Huy\_6

<sup>178</sup> Nyab\_4

<sup>179</sup> Nyam\_5

<sup>180</sup> Kay\_2, Gak\_6, Gak\_7, Kir\_7, Nyab\_4, Rul\_1, Rub\_10

<sup>181</sup> Kay\_4

were not interested to participate in groups and it could be difficult to some for involving themselves in agriculture activity because they were not able to follow up day to day activities due to the location of land. It was continued that whenever they got a capital, they focus on other commercial business rather than investing in agriculture.<sup>182</sup>

**Personal aspirations and abilities to participate in the agricultural sector may differ between genders and age groups.** A publication based on 25 case studies on gender equality in agricultural and environmental innovation explored the occupational aspirations and paths of rural young women and men in India, Mali, Malawi, Morocco, Mexico, Nigeria, and the Philippines. Drawing on qualitative data from 50 sex-segregated focus groups, the study revealed that despite aspiring to formal blue and white-collar jobs, young rural women and men face an aspiration-achievement gap. Many continue farming in their family's production due to unfulfilled promises of education for securing sought-after formal employment. While some young men express interest in knowledge-intensive or 'modern' agriculture, young women generally show no such inclination. Framed within a relational approach, the analysis argues that gender norms discriminating against women in agriculture discourage young women from aspiring to agriculture-related occupations. The identified norms include unequal opportunities to access agricultural innovation, perception that men are the better farmers, norms restricting women's mobility, limited access to assets, credits and information for (young) women, and social stigmas working against breaking gender norms (Elias et al., 2018). The perception that men are the better farmers and women lack confidence was also mentioned by several women groups: female youth often show very little confidence in themselves. It was also mentioned that often youth is not settled yet, which makes it more difficult to enter in agricultural activities that require a certain stability.<sup>183</sup> Further research indicates that the intersection of age and gender significantly influences opportunities for youth, as parents tend to prefer training for sons over daughters in agricultural activities. Both young men and women note gender biases in household chore assignments, with young women often burdened with domestic tasks, limiting their equal access to training opportunities compared to young men (Mudege et al., 2019). This was confirmed by field interviews which highlighted that challenges for young female farmers are similar to those of female farmers in general, however, often intensified. Young women often seem to be overloaded with household activities and if not yet married are expected to support at the parents' house until married.<sup>184</sup>

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<sup>182</sup> RuI\_6

<sup>183</sup> Nyab\_4, Rub\_10

<sup>184</sup> Kir\_7, Kay\_2

**In conclusion, while a limited number of young individuals, both men and women, express aspirations to prioritize farming as their primary source of livelihood, a considerable portion is involved in farming to varying extents.** Some young men view farming or agriculture as a practical approach to supplement or optimize their income. Conversely, for young women, farming is rarely seen as a feasible livelihood strategy. When young women do engage in farming, it is often directed towards providing food for the household, framed as an inherent aspect of the role of rural women within the household. Particularly, single mothers who farm and lack control over land or other resources often experience a sense of diminished agency and feel confined within the realm of agriculture (Rietveld (Anne) et al., 2020).

**The field interviews revealed that in many of the districts, youth seemed to have little aspiration to enter the agricultural business** as they did not see it as a profitable business, requiring high investments and bringing low returns. They also considered it to be a business that brings many risks, as well as consider it as something for the "old personal" or the "vulnerable youth".<sup>185</sup> It was furthermore pointed out that especially young women may not feel motivated to working in agriculture related to the high risks of investments, as well as a lack of confidence to do commercial activities in the agricultural sector.<sup>186</sup>

**A preference for formal blue and white-collar jobs among rural youth may stem from structural issues that do not adequately consider young people's needs and position.**

Young individuals might be expected to participate in agricultural value chains without possessing decision-making authority or influence over the outcomes. This lack of empowerment could potentially drive them away from agriculture and towards alternative occupations where they perceive greater control. To ensure meaningful participation, it is crucial to consult with young people as citizens, understand the barriers and opportunities they face, and develop more effective strategies to promote and support their engagement in agriculture (Mudege et al., 2019).

According to different interviewed agricultural actors among districts, the lack of motivation may also be linked to youth's limited access to land and capital. In the case of Rubavu district, a youth cooperative producing tomato reported about not being able to get land for their production and therefore looked for it in a different district (Nyamasheke district).<sup>187</sup> Additionally, self-employment may not be encouraged by educational institutions, thus influencing youth to look for employment rather than becoming self-employed.<sup>188</sup> In the Kirehe district, interviewed actors in poultry farming indicated

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<sup>185</sup> Gak\_13, Huy\_1, Huy\_7, Kay\_5, Ngo\_9, Nay\_3, RuL\_2, Rub\_9, Rwa\_3, Nyam\_7, RuL\_13, Rwa\_6, Rwa\_7, Nyam\_5, Nyab\_3, RuL\_2

<sup>186</sup> Ngo\_6, Kir\_8, RuL\_8, Rub\_4

<sup>187</sup> Rub\_8

<sup>188</sup> RuL\_2

that young women may consider poultry farming as a more attractive job opportunity once they have been well capacitated on agricultural skills, self-confidence, and once their access to financial services has been improved.<sup>189</sup> Although opportunities exist to support youth in agriculture, they seem to not be used sufficiently<sup>190</sup>. In order to guarantee the success of SERVE interventions targeting youth, youth's lack of aspiration to enter agricultural sector need to be considered. Interventions should be designed in a way it can help youth see the potential of the agricultural business, as well as enhance their confidence to participate in it.

**According to the study by FAO and WFP (Angelica Senders et al., 2020), certain government commitments are necessary to improve the representation of women in agriculture.** Based on that study and considering the aforementioned challenges, the following recommendations can be opportunities to improve the equal rights for men and women in agriculture:

- **Promote equal rights in rural development:** To improve equality in rural development, women and men must be equally involved the planning and implementation of development activities.
- **Ensure equal access to financial resources:** Improving the access to financial resources means to ensure equal rights to inherit economic resources. Furthermore, by supporting women to organize themselves into agriculture cooperatives and other support groups, their access to economic opportunities (e.g. through self-employment) can be improved. Also, barriers for women to access credits and financing, such as agricultural credits or financing small- and medium enterprises (SME) need to be addressed.
- **Improve women's access to land and agricultural resources:** The 1999 inheritance law granted equal rights to women and men to inherit property. To improve the access to land and property for women, it is important to also ensure such equal access to property in praxis. Female representation in the agricultural sector can be enhanced through better access to agricultural resources, such as credits, modern technology and resources from income-generating agricultural practices. Gender-sensitive measures to transform subsistence agriculture into market-oriented agriculture can help empower women in agriculture.
- **Strengthen equal representation in decision-making spaces:** Female participation in decision-making spaces must be strengthened, for example through promoting agriculture cooperatives for women and ensuring the representation of women at all levels of mixed cooperatives.

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<sup>189</sup> Kir\_8, Kir\_9

<sup>190</sup> Nyab\_2

#### 9.2.4. Gendered impacts of Climate Change

**Women and men are vulnerable to climate risks, primarily due to their involvement in exposed agricultural sectors, sensitivity to climate-related shocks, and their capacity to cope with such risks.** However, women tend to be more vulnerable, facing a higher likelihood of being killed by natural disasters, experiencing increased hunger post-climate-related disasters, and having limited livelihood diversification options. While men can be vulnerable in high-risk occupations, male outmigration as an adaptation strategy often results in increased labor responsibilities for women without necessarily improving access to finance, social networks, or knowledge. Poor women and those from vulnerable groups face escalating work burdens, loss of support, and heightened vulnerability amid limited resources. (Koo, Jawoo et al., 2022).

**Research conducted by the Kvinna Till Kvinna Foundation (Kvinna till Kvinna Rwanda, 2021) in Rwanda reveals that given the majority of women's involvement in agriculture, they highly value consistent rainfall and a balance of rain and sunshine for optimal harvests.** This underscores the significant impact of climate change on women's activities in Rwanda, particularly in accessing water, food, and fuel. During droughts or heavy rains, women and girls often face increased challenges in collecting water and firewood, leading to adverse effects on agriculture, livestock, and overall household well-being, including the forced sale of assets for survival. The study uncovers the unequal effects experienced by women in the face of disasters, severe weather events, and climate change, intensifying pre-existing disparities in roles, resources, and power dictated by cultural and social norms. The consequences of climate change further amplify these challenges, particularly impacting the projected income from agricultural activities. Given that women constitute the majority of the workforce in this sector, they bear the brunt of these economic and emotional repercussions.

**Across all 10 study districts, women bear a disproportionate burden of unpaid care work, including cooking, cleaning, and caregiving, exacerbated by climate change impacts and natural hazards.** Engaged in at least two and a half times more unpaid household tasks than men, women have less time for paid labor and often work longer hours. Climate change further hampers their economic opportunities, as men can easily migrate to safer regions, leaving women to cope with the increased responsibilities of caring for children, the elderly, or sick family members in the face of environmental challenges. Instances were noted where men abandoned their families to seek economic opportunities in areas less affected by climate-related issues.

**The study highlights a robust connection between the impacts of climate change and conflicts or gender-based violence within communities and families.** As the effects of climate change worsen people's livelihoods, there is heightened pressure on scarce

natural resources, resulting in various conflicts, such as succession and inheritance disputes, often escalating to broader community conflicts. Specifically, the qualitative analysis of the study reveals an increase in violence against women and girls, directly linked to the impacts of environmental and climate change. Another study (Sheira et al., 2024) shows an increase in transactional sex among young women, i.e. sex in exchange for economic support such as money, food, gifts, drugs, alcohol, or shelter, positively correlated with increasing food insecurity. Within households, adolescent girls and young women often bear a disproportionate burden of food insecurity which therefore puts them at a higher risk for committing to transactional sex making them vulnerable to sexually transmitted infections, such as HIV, and unplanned pregnancy.

**The study** (Kvinna till Kvinna Rwanda, 2021) **interviewed 32 female respondents with disabilities in Nyarugenge district, who primarily obtained information about government environmental initiatives through radios, focusing on maintaining cleanliness, protecting forests, and avoiding the use of plastic bags.** While both men and women with disabilities face challenges from climate change impacts, women encounter distinct difficulties, particularly in receiving information, as societal stereotypes and stigma persist. Women with disabilities emphasized the lack of accessible environmental education materials tailored to their needs, leaving them vulnerable to climate change impacts based on the nature of their disabilities.

**The study reveals that the impacts of climate change, such as unpredictable heavy rains, affect both boys and girls, causing them to miss classes.** However, respondents from all 10 districts consistently reported that girls are disproportionately affected compared to boys. Instances were noted in Ngororero and Burera districts where girls, fearing the risks posed by heavy rains, missed classes or dropped out of school, particularly due to damaged bridges. While girls perceive the risks of floods or landslides more significantly, boys, who generally consider themselves 'stronger,' are more likely to attend school. Adult females also indicated that women tend to stay home during heavy rains, further restricting the movements of women and girls compared to men and boys.

### **9.2.5. Assessment of intersectional factors and dynamics affecting people with disabilities and refugees**

#### **Persons with disabilities in Rwanda**

**In Rwanda, 3.4% of residents over the age of five have disabilities.** This number is slightly higher in rural (3.7%) compared to urban areas (2.8%) (Government of Rwanda, 2023). Persons with disabilities in Rwanda face different challenges. Such challenges are

predominantly linked to the access to education, health care and employment, as well as an increased risk of poverty (Government of Rwanda, 2023).

**According to the Government of Rwanda (Government of Rwanda, 2023), 51% of persons with disabilities have previously attended school**, however in many cases they are not able to reach higher levels of education. In rural areas, persons with disabilities are twice as likely to have not completed primary school than persons without disabilities. This is most likely due to the lack of suitable educational facilities for persons with disabilities in rural areas (Government of Rwanda, 2023). Schools that have the necessary infrastructure to provide (higher) education to persons with disabilities are often located in urban areas and are private. The lack of suitable infrastructure and safe transport, as well as the limited financial resources of poorer families make the access of higher education more difficult for persons with disabilities (USAID, 2019).

**About 30% of persons with disabilities are employed in Rwanda, whereas 48% of the population without disability has employment** (Government of Rwanda, 2023). The exclusion of persons with disabilities in employment is often related to discriminatory social norms. Insufficient public resources are allocated to inclusive health care treatments and infrastructure (Dina Scippa & Alice Bamusiime, 2019). In relation to their limited access to different types of services, persons with disabilities are exposed to higher risks of homelessness, as well as sexual abuse and exploitation (USAID, 2019). Sectors that more often employ persons with disabilities are agriculture, forestry, and fishing (USAID, 2019). According to the National Union of Disabilities' Organisations of Rwanda (NUDOR), people with disabilities working in the agricultural sector struggle to sell their products in viable markets. The training and technical assistance for value chain management to improve such access is lacking<sup>191</sup>. NUDOR further highlighted that the challenges faced by persons with disabilities are deeply rooted in societal norms and various contextual factors affecting their daily lives. The often-overlooked significance of addressing the needs of persons with disabilities within the agricultural sector was highlighted, stressing the lack of sustainable support for persons with disabilities engaged in agriculture. NUDOR advocates for an intersectional approach, posing a crucial question about how this intersectionality can be effectively addressed and targeted. The key recommendation was to go beyond merely providing agricultural skills or technical support. Instead, there was a call to comprehensively understand the multitude of challenges PWD encounter, hindering their access to services and impeding their success.<sup>192</sup>

**The challenges faced by persons with disabilities in Rwanda are even greater for girls and women.** According to a study on the entrepreneurial development of women with

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<sup>191</sup> Kig\_11

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disabilities in Rwanda, 49.6 % of girls and women with disabilities have never attended schools. This is 17.3 % more than their male counterparts. The lower levels of education for female persons with disabilities may be caused by the inaccessibility of schools, often located in urban areas and the lack of safe transport for female persons with disabilities. Girls with disabilities may need further assistance for their menstrual management. The lack of access to sanitary products and educational staff who can help female persons with disabilities during their menstruation further hinders their access to education. Harmful social norms create additional barriers for girls and women with disabilities. Gender and disability-related stereotypes may cause girls with disabilities to be perceived as not worthy of education. In families with limited resources, the education of boys is often prioritized (Gasana et al., 2023).

**Furthermore, female persons with disabilities often experience bullying, sexual violence, and rape.** In some cases, this violence results in early pregnancy, which can be a further reason for a school dropout. Similar to the access to education, physical barriers, such as the lack of safe transportation, workplace adaptations or the provision of necessary products and materials, also lead to difficulties for girls and women with disabilities in finding employment. Societal norms reinforce underrepresentation of female persons with disabilities and make it difficult for companies to want to employ them (Gasana et al., 2023).

## **Strategies to support persons with disabilities**

**Training can be an important element to support PWD. This can be two-fold: Training for people with disabilities and capacity development for SERVE staff.** Reducing the challenges for persons with disabilities in Rwanda means providing training on self-advocacy, self-confidence, disability rights and social inclusion to persons with disabilities, especially women (Gasana et al., 2023). Moreover, specifically training women and girls with disabilities on business skills and entrepreneurship development as well as opportunities for loans and financial aid can provide significant support to reduce barriers. Staff involved in the program should be trained, so that they are aware of the rights, needs and capabilities of persons with disabilities. Staff is often not aware of the needs of persons with disabilities and might just overlook them (SPARK, 2022). Therefore, it is recommended that SERVE provides training to their staff to improve inclusive project activities and workspaces.

**Assessment of the situation of PWD, adequate provision of information and consultation:** The National Council for Persons with Disabilities (NCPD) underlines the necessity to conduct evidence-based research to improve the understanding on how to minimize the marginalization of persons with disabilities. In an interview, NUDOR also emphasized that

it was not sufficient to only provide agricultural skills or technology, but also to understand what other challenges PWD are facing that might limit their access to certain services or that keep them from performing successfully. The interviewed expert stressed the importance of considering the compounded vulnerability that persons with disabilities are exposed to. Thus, it is necessary to consider the intersectionality of issues that cause barriers to access work, including the agricultural sector<sup>193</sup>. Therefore, it is recommended to assess the situation of PWD in the project area carefully by engaging with persons with disability at an early stage and ensure that consultations are conducted in a way that facilitate the full participation (e.g. through choice of physically accessible locations and provision of information in varied formats) (SPARK, 2022). The provision of accessible materials to persons with disabilities creates an opportunity to improve their performance and the overall inclusiveness of the sector<sup>194</sup>.

**Promotion of networks and decision making: SERVE should aim to collaborate with organizations.** Networking among PWD should be promoted, for instance through the establishment of peer groups, cooperatives or the creation of voluntary village saving groups and loan associations targeting PWD improving the access to income-generating employment. In order for local development agendas to be more inclusive, the access of persons with disabilities to decision making spaces must be improved (USAID, 2019). By strengthening their networks, access to decision making could also be enhanced. Therefore, SERVE should aim to empower persons with disabilities to know their rights and gain decision making roles within promoted project activities.

## Refugees in Rwanda

**According to UNHCR (UNHCR, 2023), 133,628 refugees and asylum seekers are in Rwanda as of July 2023.** Mainly including people from the Democratic Republic of the Congo (61.4%) and Burundi (38%). 91% of refugees in Rwanda live in the five refugee camps of Rwanda. Of those refugees that do not reside in refugee camps most live in urban areas of the country. Approximately 76% of the refugees are women and children. Refugees have the right to work and are progressively integrated into national systems by the Government of Rwanda.

**Refugees that come to Rwanda face difficulties securing their livelihoods.** The financial aid refugees receive is often insufficient and the access to economic opportunities is restricted (UNHCR, 2017). Poor living conditions in many refugee camps further complicate the quality of life and exposes them to increased health risks (Barnes et al., 2021).

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Gender equality in livelihoods faces numerous barriers, reflecting deeply ingrained community perceptions regarding gender roles. These perceptions impose constraints on the aspirations of both women and men, confining them to predefined livelihood roles associated with their gender. Additionally, refugee women encounter challenges in physically accessing livelihood opportunities within camps or neighboring communities. Refugee men have more opportunities to earn income outside the camps than women because of the wider range of income generating activities available to them in the host communities. Moreover, the limited linkages to microcredit schemes and the lack of community awareness on gender equality further impede progress. Another challenge lies in the insufficient development of entrepreneurial and business skills among some refugees, male and female. This, coupled with restricted access to business opportunities, hinders their ability to thrive economically. To overcome these obstacles, it is imperative to invest in skill-building programs and create an environment that fosters entrepreneurship among refugees (UNHCR, 2016).

**A case study on agricultural activities in a refugee camp in Uganda identified challenges that are specific to refugees working in the agricultural sector.** A major challenge appeared to be that the arrival of refugees in the host country does not necessarily correspond to the calendar of agricultural products. Furthermore, increased extreme weather events and poor soil in refugee settlements further complicated crop production and agricultural activities for refugees (FAO, 2017). Gender equality among refugees is impaired, as girls and women in refugee camps do not have equal access to education, income and health services compared to male refugees (Barnes et al., 2021).

**Various gender-specific barriers complicate the access to education for female refugees.** Such barriers may be the lack of safe transport to higher educational institutions located far from refugee settlements or gender-based violence in schools due to a lack of persecution of violent acts. Additionally, societal gender norms impact female refugees' access to education. Domestic work is widely perceived as the women's responsibility, causing a lack of parental support for girls' education. Education for female refugees may be seen as high-risk investment for refugee families due to the chance of early pregnancy. Thus, among female refugees, school dropouts are higher in comparison to male refugees (UNHCR, 2017).

**Female refugees, especially young single women, are at risk of discrimination and gender-based violence.** Poverty emerges as a critical determinant preventing girls and women from realizing their full potential, negatively impacting their sexual and reproductive health. Poverty perpetuates gender inequality and exposes female refugee youth to sexual and gender-based violence. Economic hardship often pushes them into early sexual activity or exchanging sex for basic necessities, leading to unintended

pregnancies. In some cases, families may even encourage their daughters to get pregnant to increase aid received in the form of food rations or cash assistance. Teenage pregnancy has been found to be a major health challenge for female youth from refugee backgrounds residing in refugee camps. Refugee women face fewer formal employment opportunities, compelling them to engage in poorly regulated informal jobs. This informal sector exposes them to low wages, workplace discrimination, sexual assault, and inadequate access to healthcare (Barnes et al., 2021).

**Difficult access to education has consequences on the employment rates of female refugees.** According to the UNHCR (2017), more male than female refugees are earning income in Rwanda. While about 40 – 41% of fathers and sons are working, only 21-34% of mothers and daughters are employed. Female refugees mainly conduct in domestic work, whereas men work predominantly in construction and digging. This distribution of work among refugees can partly be explained by traditional gender norms (Barnes et al., 2021). When looking at the income-generating activities related to agriculture, certain tasks are predominantly taken over by men. According to the UNHCR report, 31 % of interviewed refugee men raise cows, whereas no one of the interviewed refugee women is responsible for that task (UNHCR, 2017).

**A study on gender equality in Rwandan refugee camps shows that less job opportunities exist for female refugees in the formal sector.** However, working in the informal sector can mean lower wages for female refugees, as well as higher chances for discrimination, exploitation and sexual assault. Working in the informal sector also limits female refugees' access to health care provision. Due to inadequate sexual and reproductive health services, teenage pregnancies are a major health risk for female refugees. Barriers to access these services may be related to language barriers, unprofessional behavior of health care staff, lack of confidentiality, among others. Additionally, within refugee camps, the risk of gender-based violence is increased, often due to the absence of public lighting, and the overcrowding of such settlements (Barnes et al., 2021).

**Tackling gender quality issues among refugees in Rwanda is no easy task.** The humanitarian staff working in refugee settlements often do not see it as a priority and do not have the necessary knowledge to effectively address gender inequalities. Furthermore, there is a lack of representation of refugee women in higher positions in refugee committees (UNHCR, 2017).

## **Strategies to support refugees**

**Opportunities to address the mentioned challenges for refugees in Rwanda are predominantly related to improving their access to education, work and health care.** Facilitating the access to financial scholarships for refugees and vocational training

opportunities, especially for female refugees can support to achieve income-generating employment in the formal sector, including agricultural work (UNHCR, 2017). The training of educational and humanitarian staff on topics of sexual exploitation and the promotion of viable health infrastructure, including sexual and reproductive health services in refugee camps can reduce gender-biased violence and reduce health risks as well as school dropouts for female refugees (Barnes et al., 2021).

**Certain projects and programs exist to support refugees in the agricultural sector.** Such efforts can help guide activities to support the integration of refugees in the agricultural sector in Rwanda. The UNHCR collaborates with different development agencies and actors from the agricultural sector to help the economic empowerment of refugee farmers (FAO, 2017). The program's activities focus on the promotion of efficient production and access to viable markets, as well as improving the resilience against risks (e.g. extreme weather events etc.). In 2018, the FAO, jointly with UNHCR and WFP started the Misizi Marshland Joint Programme in the Mugombwa Refugee Camp in the Gisagara district of Southern Rwanda. Land was provided by the district authority, FAO contributed seeds and technical expertise and UNHCR engaged with the refugee communities in registering for and participating in agricultural activities. The project benefited a joint cooperative of 300 households from the refugee camp and 1,127 host community farmers. The project focused on the promotion of maize production for both, local commercialization and subsistence. Similar programmes have been initiated by UNHCR in Nyabicwamba (covering Nyabiheke Refugee Camp), and Mushishito (covering Kigeme Refugee Camp) marshland.

In a project in Uganda, the Food and Agriculture Organization of the United Nations (FAO) and partners attempted to promote agricultural activities among refugee settlements to improve food and nutrition security. Activities included the provision of materials and resources for small scale vegetable cultivation and animal farming, as well as training in entrepreneurship and animal farming practices (FAO, 2017).

In summary, for the SERVE project to effectively address the needs of refugees, it is imperative to expand project activities into refugee camps. The majority of refugees in Rwanda reside in one of the five camps, making it crucial for the project to encompass these areas. The initiatives by FAO and UNHCR, as highlighted earlier, which concentrate on promoting agriculture by assisting both refugees and host communities located near the camps, serve as commendable models for SERVE's activities. Potential activities have been integrated in Chapter 9.4 Strategies for female youth, PWD and refugee engagement aligned with CARE's Gender Equality Framework.

### 9.3. Key gender issues and inequalities encountered in the selected value chains

**The representation of women in the segments of the various value chains depends on the type of value chain, given that some value chains are dominated by men and others by women.** In several value chains women and men are equally represented.

According to consulted women groups, answers of respondents differ regarding the involvement of women in different value chains. A tendency is visible where women are more often involved in vegetable and fruit value chains, such as french beans, chili, carrots and cabbage. Regarding livestock crop women seem to be involved in poultry production. Crops that generate income (Cash crops), such as tomato and banana tend to be predominantly taken over by men. However, sometimes women support their husbands in activities along those value chains (planting seeds, weeding). Youth tend to be involved in poultry farming. Female youth tend to take over the traditional tasks of women, and young men are more involved in the typical tasks of older men.<sup>195</sup> For instance, in Kayonza, women are primarily tasked with cultivating French beans, chili, and managing poultry, while men are inclined towards growing tomatoes. However, for certain crops such as carrots or onions, both women and men participate equally. Notably, young women like Jane Namurinda engage in poultry farming, finding it financially rewarding and transforming their perception of work. Previously feeling jobless and confined to unpaid household activities, she now values her role as a worker, contributing to both her income and sense of purpose.<sup>196</sup>

**Both genders are represented in the value chain of food crops and livestock. However, in the food value chain women are generally represented more at the lower levels of the value chain, working as small-scale retailers or sellers in the market.** In the livestock value chain, women are represented more in the value chain of small livestock, whereas men are more often responsible for holding large livestock. This distribution of representation can be explained by the household duties many women are responsible for. Holding small livestock gives women more time to take care of household duties. In value chains, food and livestock, a trend is visible where women are less represented in levels of higher investments. However, at lower investments levels, (e.g. 200,000 – 500,000 FRw), businesses are owned by women at 80 %. (World Vision & Australian Aid, 2018)

**Female entrepreneurs are represented more in the informal agricultural sector.** Here they have smaller businesses and less-valuable products. Their lack of representation in

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<sup>195</sup> Gak\_6, Gak\_7, Huy\_6, Kay\_2, Kay\_4, Kir\_7, Kir\_16, Nyam\_5, Nyab\_4, Rul\_1

<sup>196</sup> Kay\_2

the formal sector and larger agricultural businesses can be explained by the limited access to formal financial services and land (Angelica Senders et al., 2020).

**When looking at youth, a separation between genders is visible**, as young men are predominantly involved in men-dominated value chains, such as timber, whereas young women are more involved in female-dominated areas, such as fruits. In value chains on livestock, young women are hardly represented (World Vision & Australian Aid, 2018). In order to better understand the gender-specific division of labor along the various value chains, an intensive exchange with farmers is required.

**When looking at persons with disabilities, critical absence of value chain management was emphasized** by NUDOR, often resulting in successful production without a corresponding market for selling products. There is a pressing need to enhance market access for individuals with disabilities and facilitate the sale of their harvest or products. This involves actively seeking potential clients who can purchase the products. A strategic emphasis on the value chain is paramount, prompting consideration of the subsequent stages post-production and how best to position persons with disabilities within these stages for sustained success.<sup>197</sup>

**Concerning key gender issues for the selected value chains, the following main outcomes were collected** during the field consultations:

- **Chili:** Interviewees report that participation of women in the chili value chain is generally high in all districts. They are predominantly involved in the production of chili, taking over tasks from planting to harvest. Some districts also state that women are involved in tasks after production, e.g. marketing. In Rwamagana district, an interviewed chili processor stated that participation of women in the chili value chain depends on temporary or permanent contracts. 90 % of temporary worker are women, whereas only 40 % of permanent workers are women.<sup>198</sup>

Tasks taken over by men are those requiring physical strengths, such as pesticide application. In the Kirehe district, chili producers claimed that women own chili farms to the same extend as men. In Ngoma district, Chili farmers stated that less women than men own chili farms, because of limited access to investment and little self-confidence. For youth it is also still difficult to participate in chili farming activities for different reasons (not specified) and the insecurity of profitability of the commodity (Rulindo).

Some districts (Ngoma, Rulindo) seem to already have farmer promoters and FFS facilitators who help to provide training on the mentioned topics. However, it is

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<sup>197</sup> Kir\_11

<sup>198</sup> Rwa\_6

necessary to provide continuous training to such promoters and facilitators, so they can stay up to date.<sup>199</sup>

- **Skill gaps for females and youth workers:** In the chili value chain, most farmers report about knowledge gaps, especially for women. These are most often related to greenhouse farming, climate change risk and diseases management, access of finances (loans etc.) and markets, production for quality certification.
- **Poultry:** Women participate in poultry value chain at high rates, especially during the farming stages - taking care of feeding and cleaning. Women also seem to take decisions on the activities they are involved in during the value chain.

In Ngoma district, the farmer group mentioned that women are often mainly responsible for managing poultry production, however the man takes over investment and marketing. They also observed that the participation of young females in poultry production is very low (around 20%) compared to older women (around 80%). This is also mentioned by FG in Rubavu, that say that female youth participation is still low due to lack of financial capacities. In Rubavu they founded a youth farmers group in 2020, which demonstrates the interest of youth in the poultry value chain.<sup>200</sup>

- **Skill gaps for females and youth workers:** Farmers report about knowledge gaps regarding poultry farm management, including knowledge and shelter construction, feeding and disease management. For women and youth knowledge gaps reported on were on production, management, marketing and access to finance. It was also reported on the difficulty to receive quality certification and a lack of technology and production to identify the quality of eggs. Subsequently, mentioned potential lies in capacity building and training to fill knowledge gaps. In Gakenke district, it was mentioned that experience and knowledge exchange with experienced poultry producers would be an opportunity to improve their knowledge. The mentioned services can be provided by governmental institutions, consultants, and other types of donors.<sup>201</sup>
- **Tomato:** According to the reports of the different farmer groups, women seem to be participating in the tomato value chain, however, not to the extent that men are involved. Women are more often involved in production activities from planting to harvesting, and less often in activities such as marketing. In the Rubavu district, the farmer group reported on a higher participation level than in other districts (est. At 70% women's participation). The Tomato Farmers group in Rubavu reported that youth don't prefer to be involved in the tomato value chain as it requires much effort

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<sup>199</sup> Gak\_8, Kir\_2, Ngo\_3, Rul\_10, Rul\_12

<sup>200</sup> Gak\_4, Gak\_10, Ngo\_1, Rub\_2, Rub\_6, Rul\_5, Kir\_8

<sup>201</sup> Gak\_4, Gak\_10, Ngo\_1, Rub\_2, Rub\_6, Kir\_8, Rul\_5



and does not bring a lot of money. Regarding decision making, some farmer groups state that who takes the decisions is usually related to who owns the project.<sup>202</sup>

- **Skill gaps for females and youth workers:** Similar to other value chains, in the tomato value chain, farmers and producers mentioned knowledge and skill gaps regarding production increase, disease management, access to markets, use of modern technology, marketing and quality certification. Capacity and training to fill these knowledge gaps were considered necessary. Extension services are available. While some see no issues regarding those services, farmers from other districts mention the necessity to scale up such services, improving availability, also for farmers outside of cooperatives and improve services, adapting new knowledge on modern technology and other skill updates.
- **Green beans:** In the context of the green bean/french bean value chain, certain production activities are identified as particularly suitable for women and youth. These activities encompass crucial tasks such as planting, weeding, and harvesting. Notably, one farmers group in Nyabihu emphasized that cultural influences play a role in assigning these responsibilities predominantly to women. In Gakenke, it was observed that women are often preferred for tasks that demand less physical exertion, while men tend to gravitate towards activities that require substantial effort but yield higher financial returns.

Conversations with green bean producers in Nyabihu revealed a consensus that the production of green beans does not demand extensive hands-on hours due to the relatively manageable workload. In this region, female youth, alongside their mothers and other women, excel in various tasks, surpassing men in activities such as planting and weeding. The collaboration between young females and their mothers is particularly notable, with the perception that these tasks involve less strenuous effort. Additionally, cultural norms reinforce the tradition of women taking the lead in these specific agricultural responsibilities.<sup>203</sup>

- **Skill gaps for females and youth workers:** Major skill gaps visible in the green bean commodity in different districts relate to climate change risk and disease management, the lack of modern technology (especially for post-harvest), limited access to market and finance, and certification, as well as general skills and knowledge about production increase. Mentioned potential to fill these gaps are to improve capacity building (especially for women and youth) related to the mentioned knowledge skill gaps, to improve availability and accessibility of farmer extension services and to improve access to finance (especially for youth and women). It was mentioned that it is necessary to get the support of

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<sup>202</sup> Kay\_1, Kir\_4, Ngo\_4, Rub\_9, Rul\_6, Rwa\_2

<sup>203</sup> Kir\_1, Ngo\_2, Gak\_9, Nyab\_1, Rul\_11

governmental institutions and NGOs in the agricultural sector to facilitate such opportunities.

More detailed information of the respective value chains and key nodes for intervention can be found in the analysis of each value chain (see “Fit for youth employment – specifically female youth”, “Identification of Attractive Value Chain Nodes for female/youth and highlight incentives” and “Key nodes for intervention for youth/female employment” in each value chains’ analysis.

## 9.4. Strategies for female youth, PWD and refugee engagement aligned with CARE’s Gender Equality Framework

In this section, the identified nodes for interventions in the different value chains and the gender-specific challenges were combined to formulate strategies for the engagement of women, youth, persons with disabilities (PWD) and refugees aligned with CARE’s Gender Equality Framework. Table 42 gives an overview of the proposed strategies and specific interventions, grouped into the three strategic areas “Improve capabilities and practices in the agricultural sector”, “Improve participation, agency and decision-making power” and “Risk reduction and adaptation”. The strategic areas include strategies and interventions that aim to align with the principles of the CARE Gender Equality Framework to “Build Agency”, “Transform Structures”, and “Change Relations”. Although categorized into different topics, proposed interventions are interrelated and may address multiple challenges across categories.

Table 42: Proposed strategies and interventions

Proposed strategies	Specific interventions
<b>SERVE Project level measures</b>	
<b>Training and sensitization of staff</b>	<ul style="list-style-type: none"> <li>Capacity development and sensitization of project staff concerning PWD</li> <li>Staff training on Gender Equality and Inclusion</li> </ul>
<b>Disaggregated project design and monitoring</b>	<ul style="list-style-type: none"> <li>The SERVE project design should incorporate actions to promote disability inclusion with corresponding indicators to monitor their implementation</li> <li>The SERVE project should incorporate actions to promote gender responsiveness and transformation with corresponding indicators to monitor their implementation</li> </ul>
<b>Improve capabilities and practices in agricultural sector</b>	
Improve access to agricultural resources and services	<ul style="list-style-type: none"> <li>Group strengthening for input supply</li> <li>Promoting investment and gender-sensitive training on modern farming technologies</li> <li>Assessment and provision of necessary material to PWD</li> </ul>

Proposed strategies	Specific interventions
	<ul style="list-style-type: none"> <li>• Sensitization of extension service providers to target women</li> <li>• Facilitate participatory dialogue among target groups and with governmental institutions</li> <li>• Value chain specific investments in the input sector</li> </ul>
Improve access to financial resources	<ul style="list-style-type: none"> <li>• Group strengthening for financial inclusion and scaling up VSLAs linkage to formal sector</li> <li>• Establish partnerships for creation of gender-inclusive financial mechanisms</li> <li>• Increase financial inclusion by promoting digital financial services</li> <li>• Improve financial literacy of women and youth, paying special attention to usage of mobile money and agriculture insurance</li> <li>• Foster environment that facilitates investments for female youth</li> </ul>
Improve agricultural skills	<ul style="list-style-type: none"> <li>• Addressing mobility, time and safety constraints in capacity development efforts</li> <li>• Facilitate mentorship and coaching for different women, youth, PWD, refugees</li> <li>• Targeting youth for training on new technologies and inform youth about opportunities in agricultural sector</li> <li>• Sensibilize farmer promoters and Farmer Field Schools (FFS) facilitators on gender and intersectionality</li> <li>• Promote education and training of female youth on topics of relevance for different value chain nodes</li> <li>• Promote trainings and capacity development designed to meet the needs of individuals with disabilities</li> <li>• Collaborate with existing initiatives and/or seek exchange for lessons learnt and best practices</li> </ul>
Reduce double burden of household duties and agricultural activities	<ul style="list-style-type: none"> <li>• Establish childcare centers/nurseries</li> <li>• Assess the potential of gender-transformative interventions on household level</li> </ul>
Improve market access and competitiveness	<ul style="list-style-type: none"> <li>• Target women in assessment on certification possibilities</li> <li>• Provide training for female youth on post-production activities</li> <li>• Improve market intelligence through informative meetings or gatherings</li> </ul>
<b>Improve participation, agency and decision-making power</b>	
Improve representation and decision-making power	<ul style="list-style-type: none"> <li>• Develop women-only trainings on self-advocacy, self-confidence and leadership</li> <li>• Gender Mainstreaming in member-based farmer organizations</li> <li>• Facilitate dialogue between different genders and age groups over gendered roles in agriculture</li> </ul>
Reduce discrimination and (gender/disability-based) violence	<ul style="list-style-type: none"> <li>• Provide trainings on disability rights, social inclusion and GBV</li> <li>• Establish women shelters</li> <li>• Establish support groups for men to redefine masculinity</li> </ul>
Improve health care access	<ul style="list-style-type: none"> <li>• Promoting health infrastructure in refugee camps</li> <li>• Promoting access to health care on community level</li> </ul>
<b>Risk reduction and adaptation</b>	

Proposed strategies	Specific interventions
Improve resilience against climate change related risks	<ul style="list-style-type: none"> <li>• Target women in climate change risk and adaptation trainings</li> <li>• Promote investment and gender-sensitive training on climate adaptation technologies</li> </ul>

### 9.4.1. SERVE project design measures

#### Training and sensitization of staff

- **Capacity development and sensitization of project staff concerning PWD:** It is crucial to provide training for staff engaged in the program to enhance their awareness of the rights, needs, and capabilities of individuals with disabilities. Often, staff may lack awareness of the specific needs of persons with disabilities, leading to potential oversight. To address this gap, it is recommended that SERVE invest in training for their staff. The training initiative should encompass a range of topics, including but not limited to, understanding the legal rights of persons with disabilities, recognizing their diverse needs, and appreciating their varied capabilities. Through this training, staff members will gain valuable insights into the nuances of creating an inclusive environment that caters to the specific requirements of this demographic.
- **Staff Training on gender equality and inclusion:** Training of project staff on gender-related subject matters during project implementations. The topics include but are not limited to: (1) Approaches and methods to effectively include women and vulnerable groups in participatory processes, trainings and capacity building measures. (2) Relevance of gender aspects across all project activities, (3) Relevance of gender aspects in climate change impacts and adaptation measures, (4) Awareness raising concerning the risk of gender-based violence and unintended negative project impacts related to gender, including training on potential mitigation measures, (5) Awareness raising and coaching concerning the risk of SEAH, including awareness raising on what is considered as prohibited behavior by project staff.

#### Disaggregated project design and monitoring

- **The SERVE project design should incorporate actions to promote disability inclusion with corresponding indicators to monitor their implementation:** Suitable indicators could include minimum number of PWD participation in project consultations and activities. Moreover, the project should formulate activities that directly target

individuals with disabilities. These could be, for instance, measures to reduce barriers for PWD in the selected agricultural value chains, targeted trainings on business literacy or agricultural practices, or the formation of networks through cooperatives or VSLAs. Adequate measures are described in the following sections. The monitoring system of SERVE should be designed to collect data disaggregated by different factors, such as gender, age and disabilities.

- **The SERVE project should incorporate actions to promote gender responsiveness and transformation with corresponding indicators to monitor their implementation:** Suitable indicators could include minimum number of female participants in project consultations and activities. Moreover, the project should formulate activities that directly target women, men and youth. Examples for adequate project measures are listed in the following sections. These measures should ensure that women are involved but should also aim to be transformative and change how women are perceived and are engaged in the different value chains. Therefore, these measures may not only target women and young women, but also men or young men to slowly transform their view on gender and prevent gender-based violence. The monitoring system of SERVE should be designed to collect data disaggregated by different factors, such as gender, age and disabilities. A gender-disaggregated project monitoring can help the project to collect information about its performance, to identify best practices and to adapt project activities where needed.

## **9.4.2. Improve capabilities and practices in agricultural sector**

### **Improve access to agricultural resources and services**

Young women's access to agricultural resources and services is key to enhancing their agricultural production and participating more effectively in the agricultural sector. However, especially young women struggle to access agricultural resources and services. Conducted surveys demonstrated that in order to enhance the engagement of women, youth, PWD and refugees in the agricultural sector in Rwanda, their access to agricultural resources and services must be improved. Along the value chains of poultry, tomato and chili, input supply was identified as key node for intervention. Furthermore, it was considered necessary to improve extension services, provide modern farming technologies and to strengthen institutional arrangement for the provision of resources and services. The following strategies outline potential for intervention to improve access to agricultural resources and services by female youth, PWD, and refugees:

- **Group strengthening for input supply:** As it is easier for cooperatives and farmers groups than individual farmers to access agricultural inputs, farmer support groups can be an opportunity for women to improve their access to input supply, such as good seeds and fertilizers. Additionally, young female producers can utilize such spaces to exchange their experience and ideas with other women and to strengthen their decision-making.
- **Promoting investment and gender-sensitive training on modern farming technologies:** The adoption of new farming technologies can lead to the improvement of production and can help facilitate processes, thus reducing rural women's domestic workload. Nevertheless, modern farming technologies are often expensive and inaccessible to young women. Fostering an environment that facilitates the investment in modern farming technologies can aid in making modern technologies better available to young women. The availability of such technologies should be accompanied by training, tailored to the needs of young women to ensure the effective use of modern tools.
- **Assessment and provision of necessary material to PWD:** Need-based assessments can be conducted to understand what materials and services persons with disabilities require to either improve their performance in their agricultural activities or get better access to the agricultural sector in general. The provision of necessary material can improve overall participation of PWD in the investigated agricultural value chains. SERVE should engage in consultation with organizations working in the area of disability in order to learn from their experience and to establish contact with person with disabilities in the project localities. Potential points of contact could be NUDOR or one of its member organizations. When project activities are planned on the ground, this moment should be used to assess the situation of PWD on the project locality to understand what challenges PWD face in their village or community. Meeting points for consultations should be chosen that are physically accessible for PWD.
- **Sensitization of extension service providers to different target groups (women, youth, PWD):** The analysis demonstrated that many young women already have access to agricultural extension services. However, this seemed to be dependent on the districts, as some districts reported that the general level of support for female farmers is still low (Kirehe, Rulindo)<sup>204</sup>. The provision of extension services to female farmers, as well as farmers with disabilities can be improved if extension service providers are educated on the challenges and needs of different target groups. In this way, they can offer extension services on a more precise needs basis. Moreover, training of

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<sup>204</sup> Kir\_7, Rul\_1

extension staff on the needs of PWD can help to increase awareness of the needs of persons with disabilities.

- **Facilitate participatory dialogue between among groups and with governmental institutions:** In order to promote sustainable change, structures such as laws and policies must be redesigned. However, policies need to be informed by the needs of the grassroots, following bottom-up approaches. Promoting and facilitating dialog between young women, people with disabilities and refugees could improve the effectiveness of institutional arrangements for the provision of agricultural resources and services.

Specifically, to enable a dialogue with PWD, SERVE should identify persons with disabilities in the project area, identify and remove barriers for their participation as much as possible and promote building networks with government institutions, disability-specific service providers, and organizations of persons with disabilities.

Similarly, young women should be identified and engaged into consultations by providing them with a safe environment where they can share views and experiences.

- **Depending on the value chain, investments into the input sector are recommended:**

For instance, in the poultry sector, it was found that there is only a small number of industries producing inputs for poultry farm (feeds and medicines), therefore employment opportunities for female youth was found to be low. For the poultry sector it is recommended to enable investments and safeguard resources for production of inputs. A strengthened input sector could create employment opportunities for female youth. For the Chili and Tomato value chains it was found that there are job opportunities for female youth through nurseries and agrodealers, however there are established businesses offering these services and paid positions are relatively few. For the Tomato value chain, it was found that access to agricultural inputs such as pest management products and fertilizers is limited leading to high costs and/or harvest losses reducing the value chain's attractiveness to youth and young females. For green beans, the field interviews showed that differential access to timely and adequate seeds of improved varieties, quality fertilizers, and pesticides pose main challenges to women as compared to men.

### **Improve access to financial resources**

A major barrier identified in the report that keeps young women, PWD and refugees from engaging in agricultural activities, is their lack of access to financial resources, such as loans. Even though the gender gap is narrowing; male farmers still tend to have better access to formal financial services. Moreover, there is a significant disparity among farmers' financial inclusion at district level. The percentage of farmers that are banked

(i.e., they have an account at one of the banks) ranges from as low as 6% in the least banked district to 70% in the most banked district. The following strategies aim to guide interventions that facilitate the access to financial resources by female youth, PWD and refugees. More detailed recommendations can be found in the Financial Analysis of this report.

- **Group strengthening and Scaling up VSLAs linkage to formal sector:** Similar to improving the access to input, cooperatives and farmers groups facilitate women's access to loans and other types of financial support for agricultural practices. The participation and representation of young women in such cooperatives and support groups needs to be promoted through e.g. minimum participation quotas.

Village Savings and Loan Associations (VSLAs) are informal mechanisms that help enhance financial inclusion of women in Rwanda, as well as help their economic development. VSLAs could be scaled up, tailored to the needs of different groups, such as organizing VSLAs in refugee camps or VSLAs for PWD. Additionally, linkage of VSLAs to formal financial institutions, as it is done by the CARE International VSLA program (CARE International, n.d.), can be strengthened and upscaled to further improve young women's access to the formal financial sector. In this context, linkages between VSLAs and financial institutions should be strengthened.

VSLAs for persons with disabilities have been successfully promoted by other initiatives. For instance, in collaboration with NUDOR in Rwanda, the Overseas Disability Charity CBM aimed to empower individuals with disabilities by fostering financial independence. This was achieved by facilitating access to small loans and support through village savings schemes. Additionally, they establish and supported Village Savings and Loan Associations (VSLA), employing a proven approach that enables small groups to save collectively and take loans for ventures such as small businesses or income-generating activities. The initiative also included comprehensive training for group members in financial management, entrepreneurship, improved farming methodologies, climate resilience, rainwater harvesting, and solar energy (CBM, 2021).

- **Establish partnership for creation of gender-inclusive financial mechanisms:** Partnerships with formal financial institutions can help design financial mechanisms that consider the needs of young women, PWD and refugees. The conducted interviews indicated that young women often cannot apply for loans as they lack collateral. Similarly, an interview in Gakenke showed that land tenure is mostly challenging on people with disabilities and refugees. Most people from these categories would not have access to or possess the land that they could use as collateral for loans.<sup>205</sup>

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<sup>205</sup> Gak\_4



Therefore, a solution should be sought in further promotion of collateral free loan products such as group loans, value chain finance and/ or relying on alternative forms of collateral as mentioned such as biological assets as collateral in combination with agriculture insurance and credit scoring. Additionally, geographical barriers for young women and PWD may complicate loan repayments. These would be starting points to consider when creating gender-equitable funding mechanisms.

- **Increase financial inclusion by promoting digital financial services:** Digital financial inclusion offers opportunities to increase youth and women's financial inclusion because of ease of access and innovative digital products. This is particularly relevant for women's financial inclusion, given the widely documented fact that women have lower mobility and less free time, so they transact in a narrower geographic range than men. At the same time, as stated above, education programs are needed to ensure that also older women become active users of digital financial services and have access to digital devices. During the field interviews, women groups stated that some women face difficulties accessing certain services such as mobile money because they do not own mobile phones.<sup>206</sup> Additionally, a mentioned challenge regarding digital financial services were unstable networks in rural regions.<sup>207</sup> Such gaps should be addressed when promoting digital financial services.
- **Improve financial literacy of women and youth, paying special attention to usage of mobile money and agriculture insurance:** Financial literacy initiatives ought to concentrate on women and young farmers, with a primary emphasis on elucidating the significance of credit in the context of agriculture as a business. Furthermore, these programs should give special consideration to the utilization of mobile money services by older women, recognizing it as a prerequisite for facilitating access to digital financial services.
- **Foster environment that facilitates investments for female youth:** Access to finance can be improved by enabling investment environments in areas that are relevant to the demands of each value chain and give economic opportunities to female youth. In the poultry value chain, potential for investment were identified in climate change mitigation and adaptation, poultry input, and medicine. In the chili value chain, investments were seen as especially relevant in technology.

### Improve agricultural skills

**The conducted analyses on the value chains demonstrated a gap in agricultural skills.** Such a gap can be reduced through trainings and further capacity development

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<sup>206</sup> Huy\_5, Huy\_6, Nyab\_4, Nyam\_5

<sup>207</sup> Gak\_6, Gak\_7, Gak\_11, Nyab\_4

efforts on key topics along the different value chains. Capacity-development efforts should be designed inclusively, tailored to the realities of women, youth, PWD and refugees.

For each value chain, an overview of “roles and skill gaps of women and female youth” has been developed based on the field interviews (see respective value chain analysis). In summary, gaps in women’s knowledge were identified on pest and disease management, lack of modern technology, climate change risk management, market intelligence, entrepreneurship and access to finance, post-production activities such as post-harvest handling, sales and marketing, animal husbandry, product quality management, certification and production increase. For PWD it was mentioned by NUDOR that knowledge on value chain management needs to be improved.

The following specific intervention can help enhance capacity building and improve overall agricultural skills among young women, PWD and refugees:

- **Addressing mobility, time and safety constraints in capacity development efforts:** Designing trainings on the aforementioned skill gaps are important to improve overall agricultural skills among the mentioned target groups. However, such capacity-building efforts are only effective if the targeted groups participate. Therefore, participation barriers, such as mobility, time and safety constraints should be addressed. This means trainings must be conducted in areas close to the targeted groups, or otherwise safe transport that meets the necessary requirements for PWD and young women must be provided. Trainings must be held during school times, or when family members can look after children. Alternatively, childcare facilities/services must be provided. During trainings, participants need to have access to all the necessary materials that ensure their equal participation, such as translators in trainings with refugees, to overcome language barriers. To ensure that all the needs can be met, and participation can be guaranteed, target groups should be consulted about necessary requirements beforehand.
- **Facilitate mentorship and coaching for female youth, PWD, refugees:** As many agricultural skills can only be acquired through practical experience rather than theoretical training, mentorship and coaching can play a crucial role in improving agricultural skills of mentioned target groups. Mentoring is especially useful to strengthen individual skills, which is why it should be tailored specifically to the needs of young females, PWD and refugees. Experienced farmers can offer guidance and relevant insights to different less experienced target groups.
- **Targeting youth for training on new technologies and inform youth about opportunities in agricultural sector:** As mentioned above, the use of new technologies offers the opportunity to facilitate agricultural processes and reduce the workload for

youth and women in general. When designing trainings for the use of new technologies, it is useful to target youth, as they are quick to adapt to new ideas and technologies. As the knowledge of new technologies can reduce efforts and contribute to higher returns, attractiveness for youth to enter the agricultural sector can increase. Moreover, the analysis showed that youth generally exhibits a lack of motivation to look for job opportunities or create own businesses in agriculture, often neglecting its potential. Awareness raising could be promoted to highlight potentially attractive value chain nodes for youth employment along with offering suitable training opportunities.

- **Sensibilize farmer promoters and Farmer Field Schools (FFS) facilitators on gender and intersectionality:** Although many districts reported on the presence of farmer promoters and FFS facilitators, the necessity to continuously keep them updated and educate them on new topics was mentioned. FFS facilitators should be informed about barriers young women and PWD face and how they can be overcome. It is furthermore useful to have farmer promoters specialized on refugees utilized in refugee camps.
- **Promote education and training of female youth on topics of relevance for different value chain nodes:** For all value chains it became clear that better education and training on topics relevant for the respective sector can significantly increase the employment opportunities. For instance, for the poultry sector it was found that the following skills set can improve female's employment opportunities in poultry production and exports: animal husbandry, product quality management, assessment, and regulation, sales and marketing, as well as in entrepreneurship and access to finance.
- **Promote trainings and capacity development designed to meet the needs of individuals with disabilities:** SERVE could aim to reduce challenges faced by persons with disabilities in Rwanda, particularly women, through a comprehensive training program focusing on self-advocacy, self-confidence, disability rights, and social inclusion. Additionally, the project should aim to provide specialized training in the areas of business skills, entrepreneurship development, and accessing opportunities for loans and financial aid. Trainings could take the form of interactive workshops to empower individuals with disabilities, emphasizing self-advocacy and building self-confidence. They could further be used to explore disability rights and promote awareness of social inclusion to enhance participants' understanding of their own rights. Trainings focusing on entrepreneurship could be tailored training sessions for persons with disabilities to develop essential business skills. Focus on entrepreneurship development, providing practical knowledge and tools to support economic independence. Furthermore, SERVE could organize seminars to educate

participants on available opportunities for loans and financial aid, ensuring accessibility for persons with disabilities and facilitate discussions on effective financial management strategies and empower participants to leverage financial resources for their ventures.

- **Collaborate with existing initiatives and/or seek exchange for lessons learnt and best practices:** It is recommended that Care seeks exchange with ongoing initiatives, either governmental, civil society or bilateral endeavors. The field interviews gathered data on various initiatives currently underway in the relevant districts. However, despite the presence of numerous initiatives, local residents may not always reap the benefits, either because these initiatives are located in different areas or because they are only aware of them through media or word of mouth. As a result, the SERVE project has an opportunity to glean insights from these ongoing initiatives and ensure that existing approaches are more widely accessible to the local community.

In many districts, there are ongoing government initiatives:

- In Gakenke and Nyabihu, governmental officials currently work with women members of farmer groups. The interviewees stated that the government provides subsidy on agro-inputs and women in farmer groups can receive access to agricultural land owned by government. Women were also said to benefit from the [Girinka program](#), yet the program does not have an explicit focus on female farmers. The Girinka program provides agricultural support to poor rural households.<sup>208</sup>
- The government of Rwanda supports youth initiatives like [RYAF \(Rwanda Youth in Agribusiness Forum\)](#) to bring together different youth organizations, male and female youth farmers and entrepreneurs in agriculture sector and develop agriculture related projects. Through partnership with WFP, FAO, IFAD and UN women, Rwanda implemented the initiative that seeks reducing gender inequalities and poverty, improve food security, and enable women to be leaders, decision makers, and agents of change. This initiative was mentioned in interviews in Rubavu, Huye, Kayanza, Rwamagana, Ngoma and Nyamagabe.<sup>209</sup>
- [AGUKA](#) was mentioned in Rubavu as a government initiative supported by UNDP and EU that supports young people in general in various fields focusing on business development.<sup>210</sup>

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<sup>208</sup> Gak\_4, Nyab\_3

<sup>209</sup> Rwa\_3, Ngo\_9, Gak\_4; Huy\_1, Huy\_7, Kay\_5, Nyam\_7, Rub\_8

<sup>210</sup> Rub\_8

- The [Business Development Fund \(BDF\)](#) founded by the Rwandan government was mentioned in many districts supporting women and youth on collaterals.<sup>211</sup> It was further mentioned that there is a product development by BDF as loan guarantee fund for women and youth.<sup>212</sup>

Moreover, a number of private and civil society initiatives have been mentioned:

- In Rubavu, [Kilimo Trust](#) was mentioned that supports youth in industrial mechanics and manufacturing agricultural products. This year there were 70 youth graduated in this program. Amongst others, Kilimo Trust supports youth employment opportunities and bean value chain development. Further, it was mentioned that AGRA provides subsidized equipment for youth particularly tractors. The Belgian cooperation project ENABLE was said to have a specific focus on youth and agriculture to ensure better employability of vulnerable youth by improving work readiness. Furthermore, the [NICE project](#) was mentioned that aims to combat malnutrition through poultry farming. They helped a youth cooperative in Rugerero village with 1,000 chickens and built a modern vegetables cleaning area at Basilete small market.<sup>213</sup>
- In Rulindo and Ngoma, [Duhamic Adri](#), a non-profit organization located in Kigali, was mentioned as supporting youth female who invested in their value chain by providing inputs, technical skills and linking producers to markets.<sup>214</sup> In Rulindo, the Financial service providers Umutanguha Finance stated that they are negotiating with [Duhamic Adri](#) to explore collaboration in supporting youth and young female to access on loans to invest in their targeted value chains.<sup>215</sup>
- In Ngoma, [Tubura \(One Acre Fund\)](#) was mentioned to encourage and promote young female farmers to get inputs (fertilizers and seeds) on subsidy.<sup>216</sup>
- In Kirehe, [Imbuto Foundation](#) was mentioned that runs an agricultural project supporting women and youth.<sup>217</sup> In the same interviews, they also referred to [IN-ADES](#), a network of pan-African associations operative in Rwanda that focusses on inclusive agricultural development and family farming. Moreover, the [GCF TREPA](#) project was mentioned to mobilize women on savings and small loans through groups and cooperatives formation, and planting agroforestry trees.

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<sup>211</sup> Huy\_3

<sup>212</sup> Kir\_14

<sup>213</sup> Rub\_8

<sup>214</sup> Rul\_4, Rul\_5, Rul\_13, Huy 6, Ngo\_6

<sup>215</sup> Rul\_7

<sup>216</sup> Ngo\_7

<sup>217</sup> Kir\_8, Kir\_12, Kir\_13

- In several districts, in Kayanza, Ngoma, and Rwamagana the women initiative MUGORE TINYUNKA URASHOBORA was mentioned. Yet, the interviewees had not yet benefited directly from the initiative but had only heard about it.<sup>218</sup>

### **Reduce women's burden of unpaid care work**

Although women are involved in all assessed value chains, they often face the double burden of agricultural work and household duties. This affects the time women have available and the type of activities they participate in. Reducing the burden of unpaid care work can help women increase their income-generating activities, their agricultural productivity and reduce chances of poverty and food insecurity. The following strategies can help reduce women's double work burden:

- **Establish childcare centers/nurseries:** Childcare centers and nurseries can be set up to reduce the care burden on women and give them more time for agricultural activities or looking for employment in different value chain nodes. For instance, the chili value chain analysis indicated that jobs in chili production and harvesting often include extended, unpredictable working hours and a lack of structured working times requiring high flexibility from staff members. Childcare facilities should be financially accessible and should be established on community-level to avoid transportation barriers for young rural women or PWD. To relieve the burden of female refugees, childcare centers can be established in refugee camps.
- **Assess potential of gender-transformative interventions on household level:** Reducing women's burden of unpaid care work long-term may require transformations in the social norms that influence the distribution of work within households. For such transformations, the potential of interventions on household level can be assessed. An example of a gender-transformative intervention on household level is the "HRNS Gender Household Approach" which aims to promote farming as a family business. Implementing the approach can improve equal decision-making and planning in farming, encourages active participation of women in trainings and can include women in leadership positions in farming organizations (FAO, IFAD and WFP, 2020). Subsequently, such intervention can lead to a redistribution of labor within households and improve overall access to resources and capital for young women.

### **Improve market access and competitiveness**

In order to enhance overall agricultural practices, and their contribution to generating income for women, the access to markets and the competitiveness of practices should be improved. Conducted interviews demonstrated that actors along the green bean

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<sup>218</sup> Kay\_3, Ngo\_5, Rwa\_2, Rwa\_4, Rwa\_5

value chain were interested in exploring the possibility of receiving quality certification for their products, as it may lead to higher prices for products on international market. Further interventions suggested to improve market access were the provision of training for women post-production (poultry, green bean value chains) and the better access of market information (chili, tomato value chains). The following strategies outline how female youth can enhance their market access and competitiveness:

- **Target women in assessment on certification possibilities:** The interviews gave indications on the potential of product certification. When further assessing certification possibilities, female producers should be taken into focus, especially regarding sustainability certifications.
- **Provide training for female youth on post-production activities:** Representation of women could be observed in all examined value chains. Nevertheless, women were most often involved in production activities such as weeding and harvesting, which required less time, education, and effort and could be combined with household chores. Training female youth in post-production activities, such as sales and marketing, could empower women as it expands their field of activity, gives them better access to markets and increases their independence. However, it must be highlighted that such intervention should be combined with other strategies to reduce women's work burden (e.g. establish childcare centers, redistribution of household tasks).
- **Improve market intelligence through informative meetings or gatherings:** An option to improve market information and orientation to women in the agricultural sector, is to target young women when informing about the investment options, as well as regulation and certification requirements. Informative meetings or gatherings targeting producers should have a quota for minimum female participation, and invitations should be addressed to both male and female members of a household. Similar measures should be formulated to target the group of young farmers, persons with disabilities and refugees.

### 9.4.3. Improve participation, agency and decision-making power

#### Improve representation and decision-making power

Although women are involved in agricultural activities in all the value chains examined, their representation in leadership positions and their decision-making powers, e.g. in terms of income, are still limited. The following strategies can help improve representation and decision-making power among women, PWD, and refugees:

- **Develop women-only trainings on self-advocacy, self-confidence and leadership:** Trainings and peer-learning session provide opportunities to enhance women's leadership skills and self-confidence, consequently contributing to the empowerment of young women. As previously mentioned, young women may only be able to participate in such training, if childcare services are provided. For PWD and young women, the provision of safe transport is crucial to ensure their effective participation in such trainings.
- **Gender Mainstreaming in member-based farmer organizations:** The gender mainstreaming approach in member-based organizations, such as farmer organizations is a gender-transformative approach by the development NGO Trias that aims to contribute to structural changes within organization. Besides contributing to better representation and decision-making power of women in farming organization, the gender mainstreaming in farmer organizations includes the improvement of alliances between men and women (FAO, IFAD and WFP, 2020). Following a similar approach could help change relations between women and men on organizational level and can help the overall representation of women in farmer organizations.

**Facilitate dialogue between different genders and age groups:** Promoting the dialogue of groups with different gender and age over gendered roles in agriculture can help improve representation of female youth, women with disabilities and refugees in agricultural activities. Such dialogue can be integrated in already existing structures, such as farmer support groups and VSLA. Similar strategies have already been followed in an initiative by CARE Rwanda. The "Journey of Transformation" initiative engaged the male partners of women in VSLA groups in Rwanda to discuss on household, relationship dynamics and GBV (CARE International, 2019b). Reports on the results of the initiative were positive, as women and men reported to better deal with stress, leading to reduced abuse, as well as men becoming more supportive in family planning.

### **Reduce discrimination and gender-based violence (GBV)**

Women, PWD and refugees experience discrimination and acts of violence in educational and professional spaces, as well as in their own home. An early assessment jointly with knowledgeable organization such as NUDOR and Pro Femme could help to assess and formulate actions countering GBV that are still within the boundaries of the project activities. The following list provide an initial overview of strategies that can help reduce discrimination and (gender-based) violence in different spaces:



- **Provide trainings on disability rights, social inclusion and GBV:** Trainings on topics such as disability rights, social inclusion, as well as gender and disability-based violence are crucial to reduce discrimination towards women and persons with disabilities. Those types of trainings can help young women and PWD improve the knowledge about their rights, and who they can speak to in cases of discrimination. For educational and professional staff, training should be provided to better understand how discrimination and violence takes place in educational and workplaces and how barriers for PWD can be reduced. Women and PWD should be consulted prior to trainings to ensure their effective participation.
- **Establish women shelters:** Women's shelter on community-level can help victims of violence seek easily accessible safe spaces. In Northern Sri Lanka, CARE supported the establishment of Poorani Women's Shelter, which was created as a safe space for women to protect them from violence, as well as engage in feminist learning and activism (CARE International, 2019a). A similar approach can be followed. Women shelter also need to be established in refugee camps.
- **Establish support groups for young men to redefine masculinity:** In order to effectively reduce discrimination and gender-based violence, it is important to not only target young women and PWD, but to also establish safe spaces for interactions between (young) men. Women groups in Nyamagabe and Kayenze emphasized the importance of capacitating men to ensure that conflicts in the household can be reduced.<sup>219</sup> Support groups for (young) men can help transform social norms and prevent gender-based violence on household level.

### **Improve health care access**

Young women, especially those with disabilities often struggle to access important health care services. This does not only risk their lives, but also affects their possibilities of participating in income-generating activities, such as in the agricultural sector. Some of these strategies may be beyond the reach of the proposed project activities as it does not deal with health care as a core topic. Yet, it may still be worthwhile to assess options of how the project could contribute or enable an improved access to basic health care options. The following strategies can help improve access of women, PWD and refugees to health care:

- **Promoting health infrastructure in refugee camps:** Health care centers with well-educated staff should be established in refugee camps to improve female refugees' access to health care services. As teenage pregnancies are a major health risk for female refugees, health care staff in refugee camps must be trained sufficiently on

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<sup>219</sup> Kay\_4, Nyam\_5

sexual and reproductive health and related services. Such interventions are necessary to improve the provision of services and overall living conditions for refugees in camps.

- **Promoting access to health care on community level:** In different places around the world, CARE has used strategies and approaches to help different target groups to engage with different types of stakeholders, such as the providers of services, governments and private sector to improve dialogue, and accountability around health care access. Many of these strategies were based on a community-level, such as the community-level support system (CmSS) in Bangladesh, a mechanism that strengthens the community capacity to demand and use health services (CARE International, 2019a). Following a similar approach could help young women, PWD and refugees improve the quality and overall access of health care services.

#### 9.4.4. Risk reduction and adaptation

##### **Improve resilience against climate change related risks**

Women working in the agricultural sector are particularly vulnerable to climate risks. This is partly because agricultural activities are sensitive to climate change related extreme weather events, and partly because women are exposed to a higher risk of experiencing hunger and poverty after natural disasters (Koo, Jawoo et al., 2022). The following strategies propose ways to improve women's resilience against climate change related risks:

- **Target women in climate change risk and adaptation trainings:** As women are disproportionately affected by climate change risks, targeting women in training on climate change adaptation can help increase their resilience regarding climate change and natural hazard risks. The education of women on such topics could follow a similar approach as CARE's Disaster Risk Reduction initiative in Vanuatu. As part of the initiative's work, Community Disaster and Climate Change Committees were set up and trained on planning, capacity building and coordination on climate change risk reduction (CARE International, 2019a). In accordance with Rwanda's environmental policies, women and youth farmers should be trained on sustainable agriculture and the use of drought-resistant seeds. Additionally, educational efforts should include information on agriculture insurances and their potential on reducing risks to invest in agricultural production.
- **Promote investment and gender-sensitive training on climate adaptation technologies:** New technology provides a crucial asset to improve climate change

adaptation and reduce the chances of harvest and production losses. For the poultry value chain this may mean improved animal housing, soil and water conservation, the breeding of resilient chicken, modern veterinary measures for animal health. In the chili value chain, demand was reported on smart irrigation technology, soil health conservation, integrated pest management. Also in the green bean value chain, adapting irrigation technology was considered favorable. Targeting women in the education of the use of such technologies and tools could empower them and increase their overall resilience on climate change and natural risks.

## **Thematic Report 3: Agriculture financing policy**

## 10. Agriculture financing policy and other policies

### Executive Summary

**Despite the importance of Rwanda's agriculture sector for its economy, financial institutions' exposure to the agriculture sector is low.** While the agricultural sector employs three quarters of the population and contributes 23.5 percent to GDP (World Bank, 2021), bank lending to agriculture represents less than 1 percent of total commercial bank lending. MFIs' exposure to agriculture is significantly higher, but the MFI sector itself is relatively small. Constraints to agricultural lending include first and foremost the limited skills at the banks to serve the agricultural sector, high transaction costs, and high risk perception of agriculture,

**Stringent collateral requirements limit agricultural lending.** In general, banks apply stringent collateral requirements, including to agriculture lending, requiring land and properties as securities for loans above a few thousand dollars equivalent. In the banks' view, lack of sufficient collateral limits farmers and agribusinesses to access agricultural finance. Aside from banks, MFIs (including U-SACCOs) also have stringent collateral requirements for individual and agri business loans. However, for their group loans they mostly rely on guarantees from group members, complemented by cash collateral. Banks, and to a lesser extent MFIs, sometimes make use of loan guarantee facilities to complement collateral.

**The National Agricultural Insurance Scheme (NAIS) has the potential to de-risk agriculture, but uptake remains low.** Currently, there is one main agri insurance product offered by NAIS, a multi-peril crop insurance which is difficult to scale up. Of the VCs under the Serve project, NAIS covers chilis, French beans and poultry (and not tomatoes). Usage of agriculture insurance in 2020 was well below 1 percent of farmers (0.4 percent for males and 0.1 percent for females). Current usage is estimated between 75,000 to 80,000 farmers. Agriculture insurance under NAIS is subsidized with a 40 percent government subsidy.

**With 93 percent of the population financially included, Rwanda is nearing its 100 percent target for 2024, driven by the uptake of both formal and informal financial services.** Financial inclusion refers to the percentage of the adult population that has access to formal and/ or informal financial services (Finscope 2020). Informal mechanisms such as Village Savings and Loan Associations (VSLAs) play an important role in financial inclusion (used by 78 percent of adults), but the percentage of adults that only rely on the informal sector (16 percent) is declining. Informal only financial inclusion is skewed

to the northern, southern, and western provinces, adults with no formal education, women, and youth under 18.

**The gender gap in financial inclusion continues to narrow, while youth under 18 report low levels of financing inclusion.** In 2020, 92 percent of women were financially included (vs 93 percent males). However, men are more likely than women to use formal financial services. Interestingly, women borrow slightly more than men but rely less on formal sources of credit. At the same time, financial inclusion of 16- to-17-year-olds is significantly lower than financial inclusion levels of Rwanda's population.

**More than three quarters of farmers borrowed money in 2020, but mainly from informal sources; and only 5 percent borrow to finance farming activities.** There has been a substantial increase in usage of credit among Rwandan farmers with 76 percent of farmers borrowing money. The proportion of farmers borrowing from formal financial institutions has doubled, driven by informal credit, which is also the most important source of credit for farmers. At the same time, credit from formal and informal sources only makes up a tiny fraction of the financing mechanisms for farming activities, used by only 5 percent of farmers. From focus group discussions with farmer groups, it became clear that the formal loans that farmers take out (mainly from U-SACCOs and MFIs) are mostly for farming purposes.

**At national policy level, there is a strong push towards the promotion of financial inclusion and agricultural finance.** Rwanda prioritizes financial inclusion and agriculture finance in different policy documents, starting from its Vision 2050 and its national Strategy for Transformation (NST1) and continues throughout agriculture and financial sector policies. The NST1 set a target of agriculture finance to represent 10 percent of all loans by 2024 but Rwanda is nowhere near reaching this target. The National Agriculture Policy (NAP) presents a vision to have a productive, green, and market-led agricultural sector which implies a larger role for the private sector and a recognition that agricultural finance is key to increasing productivity, as is empowering women and youth.

**The Central Bank of Rwanda (BNR)'s policies are in line with international best-practice; however, BNR does not set minimum exposure targets for certain priority sectors such as agriculture.** BNR supervisory laws and regulations are prudent and in line with international best-practice, balancing the interests of all stakeholders including depositors. Priority sector lending targets are at times set by central banks to encourage lending to a certain sector of the economy such as agriculture, expressed as a percentage of a financial institution's loan book. To date, the BNR has not taken such measures, despite the low level of agriculture finance.

**The Business Development Fund (BDF) is well known for its loan guarantee facilities, but its outreach is limited.** The BDF is a subsidiary of BRD with an aim to support Micro, Small

and Medium Enterprises (MSMEs) in accessing finance as well as advisory services. The outreach of the guarantee facilities is limited to 1,000 to 1,200 beneficiaries per year (of which 201 under the agriculture finance facility) for a total guaranteed amount of about RwF 3.6 billion per year, which may be considered low. A guarantee typically covers 50 percent (75 percent for women and youth) of the collateral that is required by the lending institution and the procedure to obtain a guarantee is cumbersome.

**Different delivery models and agri finance products serve different target groups through a variety of institutional arrangements.** In Rwanda, the following delivery models for agriculture finance can be distinguished: Village Savings and Loan Associations (VSLAs), One Acre Fund model, formal group loans, Value Chain Finance, and agriculture loans to individuals and businesses. A large majority of Rwandan women in rural areas participate in VSLAs which provide basic but essential financial services to its members. The One Acre Fund serves over 600,000 smallholder farmers through an innovative, holistic credit model. Value chain Finance is not very common in Rwanda outside established VCs but it is an approach with large potential given its scalability lack of collateral. Much agriculture lending in Rwanda, by commercial banks but also by MFIs and U-SACCOs, is done in the form of individual loans or agri business loans which are heavily collateralized.

**There are two main types of de-risking mechanisms to distinguish: guarantee facilities and agriculture insurance.** Guarantee facilities help financial institutions to de-risk loans to clients with insufficient collateral but there is a danger that guarantee facilities do not enhance lending to agriculture but merely act as collateral replacement or enhancement. Agriculture insurance as offered through NAIS can be an effective de-risking instrument for farmers, but also for financial institutions that lend to farmers. Finally, there are various alternatives to land and property as collateral that financial institutions can use as alternative de-risking instruments including financial transaction histories (from VSLAs, financial institutions, and mobile money), group and personal guarantees, biological assets, and credit scores.

**A diverse set of barriers limits access to formal agriculture finance for women and youth, including a lack of focus on inclusion by financial institutions, cultural and societal barriers, lack of collateral and limited financial literacy.** Banks and other financial institutions lack focus on women and youth financial inclusion and empowerment within institutions' strategic goals and plans. Cultural and societal barriers limit women's ability to participate in financial decision-making at the household level, exacerbated by time and mobility constraints due to disproportionate care responsibilities. Women and youth farmers often lack collateral which is a main barrier to accessing loans. Youth typically do not own land, and, due to their relatively short engagement in farming or other business, have not been able to build an asset base that could serve as collateral. Finally,

limited financial literacy and limited education among women hinders access to finance.

**To fix women and youth access to agriculture finance, agriculture finance itself needs to be fixed first and a starting point could be setting agriculture exposure targets for financial institutions (e.g., 15 percent of the loan book).** Such targets are common in India, Nigeria, Brazil, China, and Bangladesh and will ensure that a certain percentage of the financial institutions' loan books is invested in agriculture.

**Financial literacy efforts need to continue to target women and youth, paying special attention to mobile money usage and agriculture insurance.** Financial literacy programs should specifically target women and youth farmers, and first and foremost focus on the role of credit in farming-as-a business. In addition, such program should pay special attention to the use of mobile money services, which are very convenient for women given time and mobility constraints. Finally, a significant financial education effort is called for when it comes to agriculture insurance which has huge potential as a de-risking mechanism but knowledge and uptake is low.

**Youth and gender-inclusive agriculture product design needs to be collateral free.** As a matter of principle, agriculture finance products targeted at women or youth should not require traditional collateral as this cannot be readily offered by women and youth borrowers. At the same time, it is not realistic to rely on guarantee facilities such as BDF as in practice they only benefit very few farmers and are not built to scale. Hence, the solution should be sought in further design and promotion of collateral free loan products such as group loans, value chain finance and/ or perhaps relying on alternative forms of collateral.

**Bottlenecks and barriers to policy entitlements include bureaucratic processes, and lack of information and transparency in allocating project benefits.** Four main types of policy entitlements can be distinguished: extension services, input subsidies, irrigation equipment subsidies and access to certain de-risking instruments including insurance, complemented by various donor and government programs. While the extension services and input subsidies, despite being restricted to certain crops or activities, reach millions of farmers, other policy entitlements operate at a much smaller scale and potential users face barriers including lack of information, bureaucracy and lack of transparency.

**Financial education/ awareness of policy entitlements is the best remedy to overcome bottlenecks.** SERVE consortium partners should ensure that financial education programs to farmers, especially to women and youth, raise awareness on the existence and potential benefits of various policy entitlements, perhaps by appointing 'coaches' that assist farmers in applying for, accessing, and reporting on such entitlements. In



addition, the program should not rely on the BDF guarantee but rather invest in developing collateral free loan products.

**Environmental and climate policies define a climate resilient development pathway for Rwanda and stress the importance of access to improved seeds and on-farm water management.** Increasing smallholder access to good quality, climate resilient seeds is recommended for enhancing crop yields and supporting greater food security. Similarly, improved on-farm water management including irrigation also plays an important role in enhancing climate resilience. Based on Rwanda's environmental policies, the focus should be on training women and youth farmers in sustainable agriculture practices and to promote the use of drought-resistant seeds and irrigation. The latter can be promoted by making irrigation loans available through the consortium partners.

**Increasing access to agriculture finance for women and youth call for an integrated set of recommendations.** First, to increase the overall level of agriculture lending, the BNR should be persuaded to set agriculture sector lending targets. Second, barriers that women and youth face in accessing agriculture finance can be addressed through financial education, promotion of digital financial services, innovative collateral-free product design, and fostering linkages between the informal and formal financial sectors. Third, (financial) education is needed to raise awareness of policy entitlements. Fourth, assisting farmers, especially women and youth, in increasing their resilience against the effect of climate change must be woven into all aspects of the approach.

In summary, women and youth access to agriculture finance can be increased by following the steps below:

1. Women & youth undergo a **comprehensive financial education program** that is organized by Serve consortium members that prepares them, among other things, for accessing agriculture finance, insurance, policy entitlements and raises awareness about the effects of climate change.
2. In the meantime, carefully selected financial institutions from among AMIR members have addressed internal bottlenecks and **developed at least 3 collateral-free agriculture loan products** that are easily accessible to women and youth, for instance by allowing for disbursements and repayment through mobile money. These products should include (1) a group loan with seasonal payments, (2) an individual input loan with seasonal payments and (3) an irrigation loan. For the individual loans, biological assets and/ or irrigation equipment will apply as 'collateral', complemented by agriculture insurance.
3. Women and youth will have **different pathways to accessing agriculture loans**, either by applying directly with a partner institution with newly developed loan

products, or through a linkage program between 'their' VSLA and a partner institution. At the same time, a support system needs to ensure that project participants have ready access to policy entitlements.

4. Aside from access to finance, women and youth farmers will need **access to improved seeds** which could be encouraged by applying interest rate subsidies only on loans that increase farmers' resilience to climate change.
5. The Serve Consortium can consider advocating for agriculture sector exposure targets for financial institutions with the BNR, for including SERVE VCS under its extension program with RAB, for including tomatoes under its insurance cover with NAIS, and reaching out to donor programs to **coordinate** efforts and explore synergies.

## 10.1. Agriculture Financing Policies, Models and Best Practices

### 10.1.1. The Agriculture Finance Landscape

**The National Bank of Rwanda is the country's central bank and regulates the financial sector.** The National Bank of Rwanda (BNR), established in 1964, is the financial sector's regulatory authority. Its current mandate is derived from Law N°48/2017, focusing on ensuring price stability and fostering a sound financial system. As such, it has licensing and supervisory authority over financial institutions including commercial banks, MFIs, Umurenge Savings and Credit Cooperatives (U-SACCOs) and insurance companies.

**The Rwandan state is a significant player in the financial sector, which is dominated by the banking sector.** Aside from its oversight role through the BNR, the state also has an indirect share in country's largest commercial bank, Banque de Kigali (BK) <sup>220</sup> which has over one third market share. In addition, the Rwandan state has presence in the financial sector through two 'market development entities' with strong developmental objectives, i.e., the Development Bank of Rwanda (BRD) and the Business Development Fund (BDF). Finally, the country's 416 U-SACCOs are initiated, registered, and supervised by Rwanda Cooperative Agency (RCA), a government institution mandated to develop the cooperative sector. Banks make up two thirds of the financial sector while the

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<sup>220</sup> BK has a diverse ownership including two entities that are ultimately controlled by the state through Agaciro Development Fund (sovereign wealth fund) 21.6% and RSSB (33.8%). Jointly, these institutions own more than 50% of the bank.

pension funds represent one sixth of the financial sector, followed by the insurance companies (9 percent) and the MFIs (5 percent).

**Rwanda's concentrated banking sector only has very limited exposure to agriculture.**

Rwanda's banking sector consists of 10 commercial banks, 3 microfinance banks, 1 development bank and 1 cooperative bank (as of December 2022). Over 75 percent of banking assets are held by the five largest commercial banks (BNR, 2023). While the agricultural sector employs three quarters of the population and contributes 24 percent to GDP (NISR, 2022). Bank lending to agriculture represents only 0.8 percent of total commercial bank lending (December 2022), down from 1 percent a year ago (BNR, 2023). The decline is perhaps due to a surge in NPLs in agriculture loans, making lenders hesitant to lend more. Finally, the state Development Bank of Rwanda (BRD)'s agricultural loan book is 3.8 percent of its overall loan book (BRD, 2023). In addition, about half of BRD's export finance is allocated to agriculture (see section 1.3 for more details). Constraints to agricultural lending include first and foremost the limited skills and operational capacity at financial institutions to serve the agricultural sector, high transaction costs, and a high risk perception of agriculture, exacerbated by limited availability of medium to long-term funding for on-lending by financial institutions (World Bank, 2018).

**MFIs and SACCOs are more engaged in agriculture lending than banks.** As of July 2022, there are a total of 457 MFIs, of which 416 are Umurenge-SACCOs (U-SACCOs), 23 private SACCOs, and 18 are registered as limited liability microfinance institutions, and total assets of the microfinance sector are RwF 356 billion (BNR, 2023). U-SACCOs have reached 2.8 million members and have considerably contributed to the increase of financial inclusion. Despite their impressive growth, U-SACCOs face numerous managerial and operational challenges (RCA, 2018) (World Bank, 2018). The share of MFIs' and SACCOs' agricultural loan book relative to their total loan book is significantly higher than the banks' share at 30 percent for U-SACCOs and 9 percent for MFIs (BNR, 2023).

**The availability of MFI-driven financial services in SERVE's operational area differs from one province to another.** When analyzing the population per MFI (lower is better), it becomes clear that SERVE's target districts in the Northern and Southern provinces are relatively well off when it comes to access to financial services from MFIs (including SACCOs) while the Western, and specifically the Eastern provinces are much less served by MFIs. For instance, while in Rulindo there are 15,000 inhabitants per MFI, in Kirehe this is almost double at 28,000 inhabitants per MFI. Despite the significant differences in availability of financial services, these patterns were not confirmed by outcomes of focus group discussions which give a picture of similar levels of access and related challenges across provinces and districts.

**Table 43: Number of MFIs in SERVE's operational area**

Province/ district	MFI Ltd	Non-U Sacco	U-Sacco	Total	Number of inhabitants	Inhabitants per MFI
Northern						
Rulindo	3	6	15	24	360,144	15,006
Gakenke	2	1	19	22	365,292	16,604
Eastern						
Kayanza	6	1	12	19	457,156	24,061
Rwamagana	4	1	13	18	484,953	26,942
Ngoma	2	1	14	17	404,048	23,768
Kirehe	2	2	12	16	460,860	28,804
Southern						
Nyamagabe	3	3	17	23	371,501	16,152
Huye	7	1	14	22	381,900	17,359
Western						
Nyabihu	2	1	12	15	319,047	21,270
Rubavu	10	3	12	25	546,683	21,867
Total	41	20	140	201	3,791,440	18,863

**Stringent collateral requirements limit agricultural lending.** In general, financial institutions have stringent collateral requirements, requiring land and properties as securities for loans above a few thousand dollars equivalent. Collateral coverage ratios are at a minimum 100 percent but can go up to 200 percent, calculated against the forced sale value of collateral. In the banks' view, lack of sufficient collateral limits farmers and agribusinesses to access agricultural finance. An exception to stringent collateral requirements is for the provision of working capital loans to finance the 'coffee campaign' where banks can be more flexible. Aside from banks, MFIs, including U-SACCOs, also have stringent collateral requirements for individual and agri business loans. Financial institutions sometimes make use of loan guarantee facilities to complement collateral,

such as the guarantee fund from the business Development Fund (BDF), but its scale is limited.

**The National Agricultural Insurance scheme has the potential to de-risk agriculture, but its main product seems to lack scalability.** In Rwanda, agricultural insurance was piloted from 2013 to 2016 by ACRE, an innovative agriculture insurance support organization. The successful pilot, which was supported by IFC, evolved into the subsidized National Agriculture Insurance Scheme (NAIS) that offers livestock and crop insurance products in all districts of Rwanda since 2019 (MINAGRI, 2023). The government-led and controlled initiative is implemented through selected insurance companies. Currently, there is one main agri insurance product offered under NAIS due to government preferences, an indemnity product commonly referred to as “area yield insurance” but in fact it is a Multi-Peril Crop Insurance (MPCI). However, according to industry experts, this product is deemed to be very labor intensive (e.g., it requires multiple field inspections per cycle), expensive and not scalable. Of the VCs under the Serve project, NAIS covers chilis, French beans and poultry. Tomatoes are not covered under NAIS but could in theory be insured outside NAIS.

**Uptake of agriculture insurance remains low.** According to the Finscope 2021 Thematic Insurance Report, 8 percent of farmers reported having used formal insurance schemes, including health, agriculture and other types of insurance (Finscope, 2021). It can be assumed that the introduction of the NAIS in 2019 by the contributed to this improvement to some extent. Awareness among adults of agriculture insurance is 32 percent (34 percent men, 31 percent women, 30 percent youth) but usage in 2020 was well below 1 percent (0.4 percent for males and 0.1 percent for females). Based on data from the ministry of Agriculture and own calculations, the number of agriculture insurance users is estimated at 78,000 farmers (0.3 percent of farm households)<sup>221</sup>.

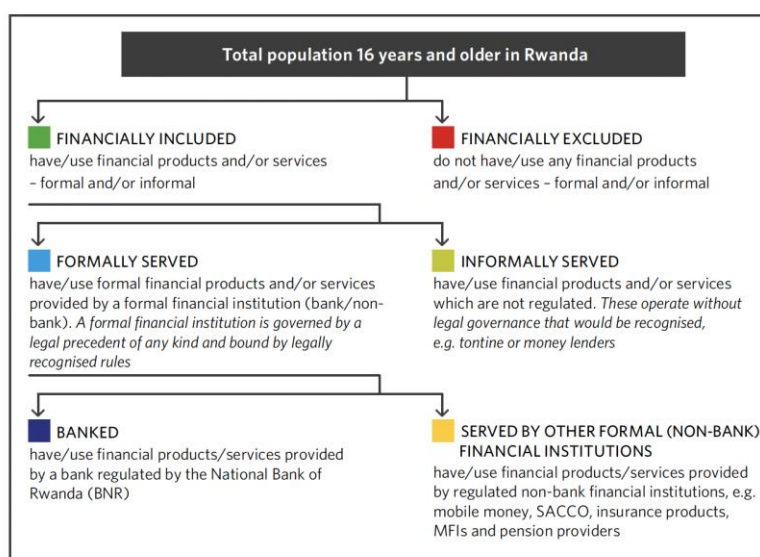
**The insurance premium before subsidies is set at 10 percent but could be much lower if insurance is more widely used.** After a 40 percent subsidy, the premium is 6 percent. The average paid premium is around USD 10 equivalent. Contrary to pricing structures during the pilot phase, pricing is not differentiated by type of product or value chain. Given the reported occurrence of moral hazard, especially in livestock insurance, the current uniform pricing structure may not be adequate. Due to economies of scale, more uptake, in combination with better, redesigned products could lead to significantly lower premiums, perhaps as low as 2 percent to 3 percent if agricultural insurance was made mandatory.

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<sup>221</sup> See section 8.3 for details

## 10.1.2. The state of financial inclusion

The Rwanda FinScope 2020 survey demonstrates that about 93 percent (6.7 million people) are financially included, up from 89 percent in 2016 (Finscope , 2020). Rwanda has made good progress in achieving high levels of financial inclusion, nearing the government target of 100 percent financial inclusion by 2024. The increase in financial inclusion is driven by the uptake of both formal and informal services. Formal products and services are provided by financial institutions that are regulated through an act of law (banks and other regulated financial institutions, including mobile money providers and U-SACCOs) while informal services refer to services from unregulated, informal financial institutions and mechanisms, including community-based organisations/ mechanisms to save or borrow money. At the same time 7 percent of the adult population do not use any financial products or services (neither formal nor informal) to manage their financial needs, i.e., they are financially excluded. Traditionally vulnerable groups such as, the poor, those residing in remote rural areas, women, and vulnerable age groups (16–17-year-olds and above 60 years old), are more likely to be financially excluded (Finscope , 2020).



**Figure 30: Levels of financial inclusion**

**Informal mechanisms play an important role in financial inclusion, but the percentage of adults that only rely on the informal sector is declining.** In total, about 78 percent of adults in Rwanda use informal financial mechanisms such as moneylenders and savings groups (Village Savings and Loan Associations-VSLA, tontine, ikibina), particularly in rural areas and among women. Focus group discussions confirmed the immense popularity

of VSLAs. However, the percentage of adults relying on informal mechanisms only has decreased to 16 percent (down from 21 percent in 2016). This implies that most people that use informal mechanisms also make use of formal financial services. Informal only financial inclusion is skewed to the northern (24 percent), southern (22 percent) and western (20 percent) provinces, adults with no formal education (30 percent), women (19 percent), and 16 to 17-year-olds (18 percent) (Finscope , 2020).

**Formal financial inclusion increased from 68 percent in 2016 to 77 percent in 2020, driven by the increased uptake of banking and mobile money.** About 36 percent (2.6 million adults) are banked, up from 1.5 million adults in 2016. About 77 percent of adults use both banks and other formal (non-bank) financial services (5.5 million individuals). Growth in non-bank financial services was mostly driven by the uptake of mobile money services (60 percent uptake) and to a lesser extent by the growing penetration of U-SACCOs (Finscope , 2020).

**The gender gap in financial inclusion continues to narrow and women are increasingly using formal financial services.** In 2020, 92 percent of women were financially included (vs 93 percent males), up from 87 percent in 2016 (vs 91 percent males). However, men are more likely than women to use formal financial services, creating a -7 percent gender gap in access and uptake of formal financial services but also that gap is narrowing over time. Encouragingly, 34 percent of women are using banking services in 2020, up from 24 percent in 2016. The use or uptake of banking products aided in reducing the proportion of financially excluded women. Interestingly, women borrow more than men (77 percent against 76 percent) but more from informal sources.

**Youth under 18 has significantly lower levels of financial inclusion.** Financial inclusion of 16- to-17-year-olds is 66 percent, significantly lower than the 93 percent of Rwanda's population. This may be because the minimum age for many financial products and services is 18 years and many 16 to 17-year-olds are still at school. Encouragingly, financial inclusion of the 18-35-year olds is at par with the population as a whole.

**Digital financial inclusion is driven by mobile money and banks but gaps in inclusion persist.** In 2020, around 66 percent of Rwandans make use of Digital Financial Services (DFS), up from 46 percent in 2016. This increase is mainly driven by mobile money, and to a lesser extent by banks. The penetration of mobile money is 60 percent (up from 39 percent in 2016). Digital finance, i.e., the provision of instant loans, is still at its infancy in Rwanda and mainly targets salary earners. Examples are the Payday loan by Access Bank, Quick Credit Payday loan by GT Bank and BK Quick, all of which can be accessed

through USSD<sup>222</sup> short codes using mobile phones. There is both a gender gap and a rural-urban gap in use of DFS: 71 percent of men are digitally included, against 62 percent women. The rural-urban divide for digital financial inclusion is even larger: 93 percent (urban) vs 57 percent (rural). There is also significant variation in DFS inclusion between SERVE target districts ranging from 41 percent (Nyamagabe) to 77 percent (Rulindo). Access to mobile phones (86 percent overall), which is a prerequisite for the use of mobile money, also differs per district. Awareness of existing DFS solutions is vital to ensure usage. Similar to actual usage, there are significant gender and rural-urban awareness gap with regard to DFS (Finscope, 2021).

**Table 44: Access to DFS inclusion and mobile phone**

Province/ District	DFS inclusion	percent access to mobile phone
Northern province	53 percent	82 percent
Rulindo	77 percent	88 percent
Gakenke	47 percent	81 percent
Eastern Province	65 percent	85 percent
Kayonza	74 percent	87 percent
Rwamagana	70 percent	91 percent
Ngoma	68 percent	87 percent
Kirehe	67 percent	84 percent
Southern province	55 percent	81 percent
Nyamagabe	41 percent	76 percent
Huye	56 percent	81 percent
Western province	56 percent	84 percent
Nyabihu	63 percent	86 percent
Rubavu	72 percent	92 percent

Source: (Finscope, 2021)

**Formal financial inclusion of Rwandan farmers is increasing and the gender gap in access to financial services among farmers is narrowing.** Formal financial inclusion for farmers increased from 65 percent in 2016 to 73 percent in 2020. Male farmers have

<sup>222</sup> Unstructured Supplementary Service Data (USSD) code is a code that is programmed into a SIM card or cell phone. USSD can be used for browsing, prepaid callback service, mobile-money services, location-based content services, menu-based information services, and as part of configuring the phone on the network.



better access to formal financial services, with 77 percent of them using bank or formal non-bank services, against 70 percent for female farmers. (Finscope, 2021). Notably, the gender gap has reduced from 12 percentage points in 2016 to 7 percentage points in 2020.

**There is significant disparity among farmers' financial inclusion at district level.** The percentage of farmers that are banked (i.e., they have an account at one of the banks) ranges from as low as 6 percent in the least banked district to 70 percent in the most banked district. Similarly, the proportion of farmers that are financially excluded (from both banks and other formal and informal financial services) ranges from 0 percent to 18 percent. The below table highlights the percentage of farmers that are banked, excluded and the travel time to the nearest bank branch (or U-SACCO) for each of the Serve Project's 10 districts.

**Table 45: Farmers' access to finance by district**

Province	District	percent of farmers banked (have bank a/c)	percent of farmers financially excluded	percent of farmers needing > 1 hr to bank (U-SACCO)
Northern	Rulindo	35 percent	1 percent	-
Northern	Gakenke	15 percent	13 percent	58 percent (U-SACCO: 40 percent)
Eastern	Kayanza	34 percent	6 percent	-
Eastern	Rwamagana	30 percent	7 percent	-
Eastern	Ngoma	24 percent	7 percent	-
Eastern	Kirehe	26 percent	8 percent	69 percent (U-SACCO: 43 percent)
Southern	Nyamagabe	20 percent	2 percent	68 percent (U-SACCO: 56 percent)
Southern	Huye	26 percent	4 percent	60 percent (U-SACCO: 33 percent)
Western	Nyabihu	15 percent	7 percent	60 percent (U-SACCO: 35 percent)
Western	Rubavu	32 percent	8 percent	60 percent (U-SACO: 34 percent)

Source: (Finscope, 2021)

**Focus group discussions and farmer interviews demonstrate that farmers have multi-faceted strategies to access financial services without notable differences at district level.** The vast majority of farmers was a VSLA member. Those that were not part of a VSLA either could not afford the weekly savings or were solidly banked (and VSLA membership did not add much value). The findings related to the use of U-SACCOs were mixed: some were very positive about services of U-SACCOs, while others thought them to be bureaucratic and expensive. Interestingly, most farmers had a layered approach to accessing financial services, relying both on informal and formal mechanisms, often combining VSLA memberships with mobile money savings and an account in an U-SACCO, MFI or bank; or even in more than one formal financial institution. Loans from the formal financial sector tended to be used for productive purposes, mostly for agriculture. It is estimated that about a quarter of FGD participants and interviewed farmers received a loan in the past two years from a formal financial institution which is not inconsistent with the findings from the Finscope surveys.

**According to the Finscope survey, more than three quarters of farmers borrowed money in 2020, but mainly from informal sources.** There has been a substantial increase in usage of credit among Rwandan farmers over the past 4 years. Indeed, 76 percent of farmers borrowed money in 2020, up from 42 percent in 2016. Specifically, the proportion of farmers borrowing from formal financial institutions has doubled, including 4 percent of farmers borrowing money from banks and 12 percent from other formal non-bank institutions. However, the main driver of this growth is informal credit (mainly VSLA and to a lesser extent moneylenders), which is also the most important source of credit for farmers (54 percent of farmers borrow from informal sources). Compared to the total population, farmers seem to be using less bank and other formal credit products, while levels of farmers that are not borrowing are similar to the total population (both 24 percent) (Finscope, 2021). Interestingly, most farmers use credit for household (including education) and other business-related purposes rather than for farming. Based on focus group discussions, most formal credit is directed to farming, which implies that most informal credit is used for other purposes.

**Only 5 percent of farmers use credit to finance farming activities.** Credit from formal and informal sources only makes up a tiny fraction of the financing mechanisms for farming activities, used by 5 percent of farmers (Finscope, 2021). Farmers rely mostly on coping mechanisms to overcome gaps in agriculture financing. These include recycling seeds from previous harvests (for 29 percent of farmers), selling crops, livestock, or other produce to get financing (22 percent), using savings (21 percent), and using money from other sources of income (13 percent) (Finscope, 2021).

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### 10.1.3. Analysis of Agriculture Financing Policies

#### 10.1.3.1. National and agricultural policies

**At national policy level, there is a strong push towards the promotion of agricultural finance.** Rwanda prioritizes financial inclusion and agriculture finance in different policy documents, starting from its Vision 2050 and its national Strategy for Transformation (NST1) and continues throughout agriculture and financial sector policies.

#### **Vision 2050**

**Rwanda's Vision 2050 is the successor to Vision 2020 and articulates the long-term strategic direction for Rwanda.** In its Vision 2050, the government lays out the pathways to transform its economy and modernize the lives of all Rwandans and serves as the planning and policy blueprint to guide the efforts of all players in Rwanda's development. Vision 2050 is built on five pillars: (1) human development; (2) competitiveness and integration; (3) agriculture for wealth creation; (4) urbanization and agglomeration; and (5) accountable and capable state institutions. The overarching objective for pillar 3 (agriculture) is to attain agriculture transformation that is equally led by both women and men professional farmers and commercialized value chains. One of the four mentioned priorities under agriculture is 'increased access to finance and risk sharing facilities' (RoR, 2020).

#### **NST1**

**Financial inclusion is one of the main priority areas in achieving Rwanda's National Strategy for Transformation, which is a key pillar for the crossover from Vision 2020 to Vision 2050** (Finscope , 2020). The National Strategy for Transformation (NST1) covers the period from 2017 to 2024 (RoR, 2017). According to the strategy, underserved populations for financial services, such as women, youth, and micro, small, and medium enterprises (MSMEs), face major challenges to achieving financial independence and, hence, are limited in terms of their contributions to the country's overall development. Hence, NST1 aims to "Bring financial services closer to people" by increasing the percentage of adult Rwandans financially included at 100 percent by 2024 (from 89 percent in 2016).

**NST1 aims at increasing agriculture loans to 10 percent of total loans by 2024.** Under NST1, the goal is to achieve a 5.7 percent average growth per annum of the agriculture sector. NST1 mentions the 'modernization and productivity increase of agriculture and livestock' as key, stating that 'a comprehensive agricultural ecosystem financing program including financing and insurance with a focus on priority value chains will be established'. As a result, credit to the agriculture sector as percentage of total loans is expected to increase to 10.4 percent by 2024 (RoR, 2017) – which is still very far off from where it is today (below 1 percent) and this percentage has declined rather than increase in recent years.

## **National Agriculture Policy**

**Rwanda's National Agriculture Policy underlines the role of agriculture in the country's transformation.** According to the National Agriculture Policy of 2018 (NAP), agriculture is a central driver for transformation toward a knowledge based, middle-income economy as it remains the backbone for sustained economic growth and providing livelihoods (RoR, 2018). The policy subtly points at past experiences of agricultural transformation in Western and East Asian countries. In particular, the policy recognizes an untapped potential for increasing yields (which are at 50 percent of potential) and minimizing post-harvest losses (which may reach up to 30 percent of production in some value chains). At the same time, agriculture transformation is hampered by land fragmentation which is expected to be accelerated by population growth, and the effects of climate change. On the upside, there is high regional economic growth and Rwanda's economy is opening up, increasing regional and international trade in agriculture products.

**At its core, the NAP presents a vision to have a productive, green, and market-led agricultural sector** which implies a larger role for the private sector. Greater private sector participation will require a shift in the role of the government from being a market actor to becoming a market enabler. To make this shift, the NAP presents an agenda for institutional and regulatory reforms which defines the principles of public investment, lays out a framework for attracting private investment to the agricultural sector and enhances the responsiveness of public institutions.

**The NAP recognizes that agricultural finance is key to increasing productivity.** Access to finance is at the very core of increasing agricultural productivity: inputs, land husbandry, animal feed, irrigation, value addition, etc. require investment before the return is received. Without finance, farmers have limited funds available for increasing production. To this end, the NAP has formulated several demand and supply side policy actions to increase agricultural financing. These policy actions include support for the demand

side through financial literacy campaigns, encouraging farmers to join savings groups and cooperatives; and supporting entrepreneurs (including women and youth) in creating bankable business plans. At the same time, it lists policy actions to increase the supply side, encouraging product development, establishing farmer databases, promoting technical assistance to MFIs and SACCOs in agriculture finance and developing value chain financing.

**Empowering women is also seen as a means to increase agriculture productivity.**

Women outnumber men in the agriculture workforce, but unequal power relations leave women with limited decision-making powers. This affects their control over agriculture inputs, assets, and capacity building opportunities, resulting in lower average productivity. Women empowerment is linked to many positive spill-over effects including household members' health and nutritional status. Women's empowerment can be achieved by provision of technical skills and promoting access to inputs, whereby access to suitable financial products is deemed critical.

**To promote youth's role in agriculture development, the NAP emphasizes the importance of training.** According to NAP, youth need access to specialized training and assistance, for instance in business skills such as meeting food safety standards and other regulatory requirements, and market orientation. The NAP calls for private sector involvement in training (e.g., in e-learning), and ensuring that training curricula are accessible to youth (and women) with minimal formal education.

**The NAP promotes off-farm opportunities for women and youth.** Off farm opportunities play an important role in diversifying and stabilizing household incomes and are critical for creating rural employment opportunities. Women are less likely to own a business than men; just 28 percent of all businesses are women owned. Youth are less likely to own land and their education may be more relevant for off-farm sectors. What is needed is support in identifying off farm opportunities, capacity building, coordination with national employment programs and last but not least developing financial instruments for off farm opportunities.

## **Strategic plan for Agriculture Transformation**

**Rwanda's Strategic Plan for Agriculture Transformation is the implementation plan of the NAP and represents the agriculture sector's strategic document under NST1.** The Strategic Plan for Agriculture Transformation phase 4 (PSTA 4) outlines priority investments in agriculture and estimates required resources for the agriculture sector for the period 2018-2024 (MINAGRI, 2018). It follows the same line of reasoning as the NAP, highlighting an increased role for the private sector, the importance of agriculture finance and the

promotion of successful agriculture finance models, the need for woman empowerment, financial literacy programs and capacity building for women and youth.

**The PSTA 4 foresees continuation of the Crop Intensification Program (CIP).** The CIP is a flagship program that started under PSTA 2 (2007) with the aim of increasing agricultural productivity for food crops. CIP currently undertakes a multi-pronged approach that includes facilitation of inputs (improved seeds and fertilizers at subsidized rates), consolidation of land use, provision of extension services, and improvement of post-harvest handling and storage mechanisms. Started in September 2007, the CIP program focuses on six priority crops namely maize, wheat, rice, Irish potato, beans, and cassava.

### 10.1.3.2 Financial sector policies

**Central bank supervisory policies are in line with international best practice.** One of the BNR's main mandates is to ensure a sound financial system. This is achieved by regulating and supervising commercial banks, MFIs and insurance companies. Supervisory laws and regulations are prudent and in line with international best-practice, balancing the interests of all stakeholders including depositors. Key prudential ratios such as capital adequacy ratios and liquidity ratios<sup>223</sup> are set above international levels but clearly consider the operating environment. While some argue that higher capital requirements and loan loss provisioning policies deter banks from agriculture lending in East Africa (ACELI Africa, 2022), in the view of the consultant, there is no direct relationship between the two.

**Unlike in other countries in sub-Saharan Africa, the effect of crowding out the private sector by T-bills is limited.** One of the main reasons of limited financial intermediation by banks and non-banks in sub-Saharan Africa is government borrowing through treasury bills or similar instruments which is in direct competition with lending. Many governments offer high returns on virtually risk-free government instruments which act as a disincentive for lending and push interest rates up to unsustainable levels. Fortunately, this is not the case in Rwanda where most bank assets consist of loans (66 percent of assets) rather than government securities (22 percent) (BNR, 2023). However, on the back of increasing T-Bill rates, the government security portfolio increased by 32 percent in 2022, twice the growth rate of the banks' total assets.

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<sup>223</sup> Total Capital Adequacy Ratio (CAR) is set at minimum 15% while Tier 1 CAR is set at 12.5%.

**Rwanda's central bank does not have policies that establish lending targets for priority sectors such as agriculture or smallholder farmers.** Examples of countries where such policies exist for agriculture lending are India, Nigeria, Brazil, China, and Bangladesh. Priority sector lending targets are usually set by Central Banks as a percentage of a financial institution's loan book (ACELI Africa, 2022). For instance, India's priority sector lending-target for agriculture is 18 percent. Banks that do not meet the target are penalized (Banking Digests, 2023) (ACELI Africa, 2022). Similarly, commercial banks in Nigeria are required by the Central Bank to allocate a portion of their loan books to the real sector of the economy, including agriculture.

### **Guidelines to Women's Financial Inclusion**

**Rwanda's Central Bank recently released Guidelines to Women's Financial Inclusion.** According to the BNR, women continue to remain disproportionately excluded from the financial sector. In response, the BNR worked closely with the IFC to develop a set of guidelines that promotes women's financial inclusion for financial institutions. These guidelines aim to equip Rwanda's financial institutions with a toolkit to account for women's financial inclusion in their strategic targets and financial products. The guidelines include recommendations to make gender a strategic priority in the goals and action plans of the financial institutions, as well as indicative actions to develop more gender-inclusive financial products including loans. It also documents several ways to include digital solutions in product creation and dissemination (BNR, 2023).

### **Financial Sector Development Strategic Plan**

**Rwanda's Financial Sector Development Strategic Plan focuses on four priorities towards a developed financial system.** The Financial Sector Development Strategic Plan 2018-2024 (FSSP) argues that a deepened, broadened and developed financial system is a prerequisite to sustainable economic growth. The strategic plan focuses on four priorities: (1) mobilizing savings, (2) private sector financing, (3) financial inclusion, (4) position Rwanda as a cashless economy, and (4) Establish Rwanda as an international financial services center (MINECOFIN, 2018).

**One of the focus areas under the FSSP's private sector financing priority is to increase agriculture lending.** Under the second priority (private sector financing), one of the four key focus areas is to increase agriculture financing whereby high collateral requirements by lenders are recognized as a major impediment. Strategic actions to increase agriculture financing include enabling warehouse receipt financing, promotion of loan guarantees and the promotion of agriculture insurance (which will ultimately de-risk

lenders). Another key focus areas under private sector financing is to strengthen the U-SACCO program by the consolidation of U-SACCOs into district SACCOs and ultimately the establishment of an apex Cooperative Bank to act as a funding vehicle for SACCOs.

**There is no reference to women & youth in the FSSP.** In the 65-page document, 'youth' (in the context of youth employment) is mentioned only once, when stressing the need for cross-sector consultations. Similarly, 'women' is also mentioned once, when referring to a former guarantee fund that was later consolidated in the BDF. The phrase "gender" does not appear at all.

### **Women and Youth Access to finance strategy**

**In 2016, the Ministry of Gender and Family Promotion issued the Women and Youth access to finance strategy 2016-2020.** While the document is past its due date, it is relevant because it specifically focuses on increasing inclusive access to finance in Rwanda as a means to achieve economic empowerment of women and youth in Rwanda. Its strategy was based on 4 pillars: (1) Advisory, Mentorship/coaching and capacity building programs; (2) Financial Access and credit enhancement (financial literacy); (3) Financial products tailored to women and youth needs and priorities and (4) Coordination, monitoring and evaluation (MIGEPROF, 2016).

## **10.1.4. Mapping of Existing Interventions by Government and Development Agencies**

### **10.1.4.1. Government agencies**

**The Development Bank of Rwanda is the government's investment arm.** Created in 1967, the Development Bank of Rwanda (BRD) is the investment arm of the Government of Rwanda, with a mission 'to be a trusted and strategic partner in the development of the country'. This mission is to be achieved by providing finance and advisory services to dynamic entrepreneurs in key priority sectors. The BRD provides financing either as loan capital or as equity. As a Development Finance institution (DFI), it typically targets large(r) projects, cooperatives, and exporters (World Bank, 2018).

**Agriculture is one of the five priority sectors of BRD but its agriculture exposure is mostly in agriculture-related export finance.** In 2021, BRD had an agricultural unit that currently consists of 2 staff which was foreseen to grow to 7. All loans are sourced through its main office in Kigali. The BRD has no specific products for agriculture and its minimum loan



size is RwF 15 million. It prices its loans 200 bp under market rates. As of December 2022, 3.8 percent of its loan book is invested in agriculture, equal to RwF 10.8 bn. For the past 3 years, its agriculture loan book has been stable but as its total loan book has grown, the share of agriculture loans to total loans is on the decline. Its main agricultural exposures are in tea plantations and factories, agri processing, maize, and mechanization. In addition, up to half of its export loan portfolio (RwF 85.8 bn; 30 percent of portfolio) is related to agricultural exports. BRD also on-lends funds to MFIs and SACCOs to increase access to finance for smallholder farmers (BRD, 2023).

**Table 46: BRD Loan book broken down by sector for 2022 and 2021**

billions of RwF Type of loan	2022	2022	2021	2021
	amount	percent	amount	percent
Agriculture	10.8	3.8 percent	10	5.0 percent
Export (of which ~50 percent to ag)	85.8	30.1 per-cent	64.4	32.2 per-cent
Energy	29.6	10.4 per-cent	29.4	14.7 per-cent
Education	5.9	2.1 percent	7.1	3.6 percent
Housing	28.5	10.0 per-cent	10.7	5.4 percent
SP & infrastructure	124.4	43.6 per-cent	78.1	39.1 per-cent
Total	285.0	100.0 per-cent	199.7	100.0 per-cent

Source: (BRD, 2023) (BRD, 2022)

**BRD also manages several 'special projects'**. These projects range from the issuance of sustainability-linked bonds, the export growth fund to a clean-cooking finance subsidy scheme in cooperation with the World Bank. The BRD is also one of the implementing partners for a USD 300 million World Bank pipeline project 'Commercialization and De-Risking for Agricultural Transformation' (CDAT). Of the USD 300 million USD 75 million is allocated to agriculture finance and agriculture insurance (NAIS) and includes funds for onlending to SACCOs and MFIs (World Bank, 2023).

**The Business Development Fund (BDF) offers various financial products and services in support of MSMEs and agriculture.** The BDF was established in 2011 by the Government

of Rwanda and the Development Bank of Rwanda (BRD) with an aim to support Micro, Small and Medium Enterprises (MSMEs) in accessing finance as well as advisory services. Financial services offered by BDF include credit guarantee facilities, agribusiness loans, leasing, and Sacco refinancing. In addition, the BDF manages grant programs on behalf of different stakeholders and offers advisory services, mainly in the form of capacity building (BDF, 2021).

**For its guarantee facilities, BDF works with banks, MFIs and SACCOs but its outreach is limited.** The guarantee typically covers 50 percent of the collateral that is required by the lending institution. Eligible women, youth, and people living with disability are provided with up to 75 percent of the required collateral. The maximum guaranteed amount is RwF 500 million for long term loans (up to 10 years) and agriculture working capital loans; and RwF 20 million for working capital loans for other sectors. The BDF does not offer portfolio guarantees. Rather, each loan is pre-approved by the financial institution after which it must be forwarded to BDF for approval. In general, such guarantees are more cumbersome than portfolio guarantees which can be issued by the financial institution directly. Whether or not caused by the rather cumbersome procedure, fact is that the outreach of the guarantee facilities are limited to 1,000 to 1,200 beneficiaries per year (of which 201 under the agri facility) for a total guaranteed amount of about RwF 3.6 billion per year, which may be considered limited in terms of outreach.

**Table 47: Outreach: number of approved guarantee projects in 2020 and 2019**

Facility	2020		2019	
	Number of beneficiaries	percent women	Number of beneficiaries	percent women
Agri Guarantee Facility	201	37 percent	148	35 percent
SME Guarantee Facility	775	42 percent	1,038	23 percent
Total	976	41 percent	1,186	25 percent

Source: (BDF, 2021)

**BDF's agribusiness facility targets university graduates with a part-loan, part grant.** This facility was designed with the objective of increasing university graduates' self-employment in market-oriented production, agriculture value addition through modern farming and transformation and linking production to market. The BDF agribusiness facility provides loans up to Rwf 10 million, repayable in 5 years. 30 percent of the loan can be converted into a grant based on certain performance criteria. Based on BDF statistics,

there were 6 beneficiaries of the agribusiness facility in 2020 and 51 in 2019, all of which were men (BDF, 2021). Again, the outreach is very limited.

**BDF provides manages agriculture-related grant projects for different stakeholders, mainly government entities.** BDF, in partnership with different stakeholders through different projects, provides grant to different sectors of activities, including agriculture, trade, and commerce. As of 2020, BDF managed the Climate Resilient Post-harvest and Agribusiness Support Project (PASP, 16 beneficiaries in 2020); Project for Rural Income through Exports (PRICE, 971 beneficiaries in 2020) Rwanda Dairy Development Project (RDDP, 1,697 beneficiaries in 2020), and Women and Youth grants (W&Y, 989 beneficiaries in 2020). Of the four above-mentioned grant projects (including W&Y), 51 percent of beneficiaries was female.

**BDF provides equipment leases to cooperatives in technical sectors and micro-leases to TVET graduates.** The Equipment Leasing facility is offered to cooperatives working in 'Udukiri' (integrated craft centers) in welding, carpentry, and leather. BDF offers equipment loans of up to Rwf 100 million with a 15 percent performance-based grant and a low interest rate. In 2020, 4 such projects were approved. The micro-lease facility aims at providing TVET graduates with equipment. BDF Provides equipment of up to Rwf 10 million to eligible companies and cooperatives. During 2020, 1,317 such leases were approved.

**The SACCO refinancing facility impacts around 75 individuals per year.** The SACCO refinancing facility is designed to increase SACCOs' capacity to lend to women and youth. Around Rwf 60 million per year is allocated to refinancing SACCO loans. On average, this facility reaches between 70 and 80 beneficiaries per year for an average amount of Rwf 800,000 per beneficiary. According the 2020 BDF annual report, the facility 'was much affected by exhausted funds that affected the approval of a good number of projects' (BDF, 2021).

**The Rwanda Agriculture and Animal Resources Development Board (RAB) implements the national policy, laws, and strategies on agriculture.** Aside from crop and animal research, RAB is responsible for the implementation of the extension services delivery all over the Rwanda (through the Twigire Muhinzi extension model), seed development and delivery, and the input (seed and fertilizer) subsidy program. RAB also implements agriculture projects in collaboration with donors such as the World Bank CDAT and SAIP projects (see below).

#### 10.1.4.2. Selected donor agency projects

##### World Bank and Rwanda Government SAIP

**The Sustainable Agricultural Intensification and Food security Project (SAIP) is a USD 33 million project that focuses on agricultural productivity increase, market access, and food security in selected districts.** SAIP is implemented in eight districts; **Rulindo, Rwamagana**, Karongi, Rutsiro, **Kayonza**, Nyanza, Gatsibo, and **Nyabihu** (overlap with SERVE project districts in bold). The project runs until 2024 and has 3 components: (1) Institutional strengthening, agriculture productivity enhancement, and nutrition improvement; (2) irrigation and water use efficiency; and (3) market linkages and value addition investment support. The latter component includes the capacity development of farmers to access finance to meet their growing business needs, skills development and business training of youth and women, and support to farmer groups in capturing value by promoting quality enhancing and pre-processing activities.

### **World Bank and Rwanda Government CDAT**

**The Government of Rwanda and the World Bank Group have launched a USD 300 million project that seeks to commercialize and de-risk agriculture sector in Rwanda** (World Bank, 2023). The new Project, dubbed Commercialization and De-Risking for Agricultural Transformation Project (CDAT) targets to increase the use of irrigation and commercialization among producers and agribusiness firms across the country. CDAT is implemented by the RAB and the BRD. CDAT will also increase access to agriculture finance and insurance with a budget of USD 75 million. In addition, **CDAT** will finance public investments in the seeds sector, develop and rehabilitate irrigation systems (18,000 ha) and apply land husbandry technologies (11,000 ha) to increase productivity and promote women and youth engagement in agriculture to enhance uptake of Climate Smart Agriculture practices. The 5-year Project will initially be implemented in 37 sites located in 16 districts, including the following overlapping sites with the Serve Project: **Huye** in the Southern Province, and **Kayonza**, and **Kirehe** in Eastern Province.

**In partnership with financial institutions, the CDAT project will enhance access to affordable agriculture finance products and services.** The aim is to expand the supply of financial products and services to farmers and cooperatives. The project will strengthen and scale up existing public financial support mechanisms through (1) institutional capacity development for participating financial institutions; and (2) credit lines for agriculture finance. Both activities will be managed by BRD based on its expertise in agriculture lending and its wholesale lending operations with other financial institutions. Of the USD 75 million budget for this activity, USD 55 million is allocated to scaling up agriculture finance. It is expected that about 2,232 households including women and youth will benefit from the agriculture finance component (implying an average loan size of around USD 25K). In addition, USD 20 million is allocated to upscaling NAIS (MINAGRI,

2023). About 650,000 farmers will benefit from CDAT's support to the NAIS, which implies that NAIS is expected to scale up significantly.

**The project also includes a special fund for youth and innovation and matching grants for commercialization.** A CDAT youth innovation challenge fund has been set aside for investment in particularly innovative solutions for the agriculture sector that can be brought to scale. The project will also support commercialization through matching grants for investments in mechanization, post-harvest infrastructure and processing equipment. The matching grant scheme will finance up to 50 percent of the asset costs and be complementary to the credit line activities under the agriculture finance component.

### **USAID Feed the Future**

**The Feed the Future Rwanda Kungahara Wagura Amasoko is an USD 18 million project that focuses on increasing high-value agricultural exports and promoting investment in the country's agricultural sector.** The five-year project, which started in 2021 is implemented by RTI International and provides technical assistance for (1) facilitating policy reforms and (2) supporting local actors to attract, mobilize, and direct public and private financing towards productive priority agriculture and food export projects. The project targets, among others, a 12 percent increase in exports of targeted agricultural commodities and USD 300 million of private investments mobilized through Rwandan government agencies (RTI, 2023).

**The Feed the Future Rwanda Hinga Wunguke project aims to increase incomes and improve nutrition in Rwanda.** The project, which is managed by CNFA, focuses on increasing agricultural productivity, improving resilience to climate change, and enhancing nutrition and food security. The project also has an 'Access to Finance' component, whereby the project facilitates access to finance and improves financial literacy skills of farmers and agribusiness so that they can obtain and manage funding needed to boost their production and incomes. Over the project life, it aims to have facilitated USD 20 million in agriculture-related financing (CNFA, 2023).

**Launched in April 2018, the five-year Feed the Future Nguriza Nshore project sought to increase employment through expanded investment in small and medium-sized enterprises (SME) across Rwanda.** The program applied a facilitative ecosystem strengthening approach to support the following three components (1) expand the capacity of financial institutions and non-bank financial institutions to finance SMEs and agribusinesses; (2) Increase private and commercial investment into SMEs and agribusinesses; and (3) Strengthen the enabling environment to create the condition of off-farm SMEs to increase their business performance and profitability. The program established

partnerships with 33 financial institutions including RIM, Goshen Finance, BK, Co-gebanque, and various SACCOs (USAID, 2022).

## **IDH**

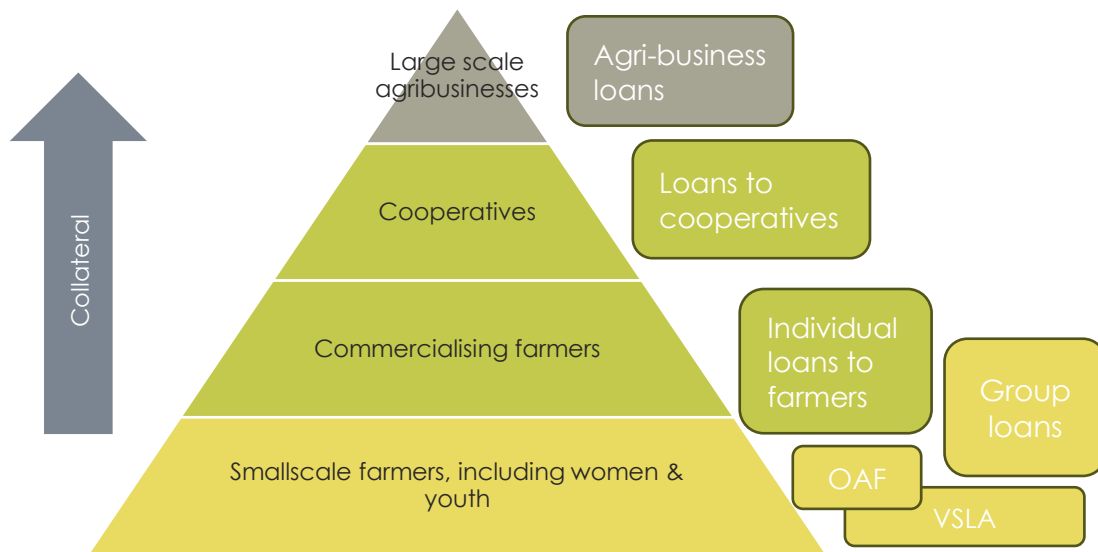
**Phase 2 of IDH's horti-export project aims to increase horticulture exports.** Specifically, the project aims to enhance the commercialization of Rwanda's horticulture sector by supporting export-oriented SMEs and create 650 new jobs (50 percent for women and 20 percent for youth), improved working conditions of employees and farm workers, and increased smallholder farmer income. Building on the achievements made under the first phase, Horti-Export phase two plans to secure ten long-term and two short-term off-take deals in premium markets including Africa, Asia, European Union, and the Middle East. Also, it seeks to establish six cooperatives with the capacity to supply to the selected horticulture SMEs. The USD 1 million project extension is expected to last until June 2024 (IDH, 2023).

## **R-YES**

**The Rural Youth Employment Support (R-YES) project is a 5-year project (2020 to 2024) that focuses on the creation of employment opportunities for rural youth through integrated agribusiness hubs.** The goal of the R-YES project, implemented by Kilimo Trust, is to create 1,200 youth jobs and 1,800 as indirect jobs. The project is focusing on youth aged between 18 and 30 years from across 16 target districts including Kamonyi, Nyanza, Ruhango, **Huye**, Rusizi, Gisagara, **Rulindo**, Musanze, Burera, Gicumbi, **Nyabihu**, **Rubavu**, Nyagatare, **Rwamagana**, **Kayanza** and Bugesera (overlap with SERVE project districts in bold) (Kilimo Trust, 2023).

### **10.1.5. Analysis of Existing Agri Finance Delivery Models and Products**

**Different delivery models and products serve different target groups through a variety of institutional arrangements.** In Rwanda, the following models can be distinguished: (1) VSLA, (2) One Acre Fund (OAF) model, (3) formal group loans, (4) Value Chain Finance, (5) loans to individuals and businesses.



**Figure 31: Schematic overview of the agriculture finance market**

#### 10.1.5.1. VSLAs

**A large majority of Rwandans in rural areas participate in Village Savings and Loan Associations (VSLAs) which provide basic but essential financial services.** VSLAs have played a key role in providing access to financial services, especially for women. In a VSLA, 25 to 30 members meet in a self-managed group once a week to save money. As the savings fund grows, the group begins to make small, short-term loans to its members against interest (up to 5 percent per month). Loans are often granted within a week after application. At the end of the annual cycle, the total fund is shared between the members. Many groups also organize social activities for their members. Based on focus group discussions, the experience with such savings groups was very positive overall, and most members stated that VSLAs helped them to develop economically. During one focus group discussion, it was said that “compared to financial institutions, VSLA loans are the best!”. In another focus group discussion, two members stated that they did not participate because they could not afford the weekly contribution. There was only one focus group that voiced a negative experience, stating that “nowadays some group leaders steal our savings”. However, given the weekly loan repayment regime, the VSLA model as such is not very conducive to agriculture financing, given that most agriculture activities are seasonal.

**Care International, which pioneered the VSLA approach, links members to financial institutions.** As the financial needs and capabilities of the group and its members outgrow what VSLA alone can provide, CARE helps to link them with formal financial institutions, often (U-)SACCOs, so that they can continue to grow their savings and their businesses.

Allegedly, loans applied for by VSLAs from financial institutions are primarily used for agricultural production, including leasing, or purchasing farmland, as well as acquiring seeds and inputs. However, it was observed that financial institutions, especially during the agricultural season, struggle to meet all VSLAs' loan requests due to insufficient liquidity. Around 240,000 Rwandans are currently members of VSLAs that CARE and its partners have helped to establish (CARE, 2023).

**Care also supports youth with the VSLA model.** Youth participating in VSLAs benefit from practical training in financial literacy and entrepreneurship and from linkages with financial institutions, as described above. The latter allow youth to access loans at amounts higher than what they could obtain directly from their VSLAs. However, youth face challenges in providing collateral required by financial institutions to access loans, as they often lack personal properties. Another potential barrier is the long distance that VSLA members must travel to reach partner financial institutions (Byansi, 2023).

#### 10.1.5.2. One Acre Fund

**One Acre Fund benefits over 600,000 farmers in Rwanda with an innovative, holistic approach.** One Acre Fund (OAF) is a non-profit organization with operating entities in 9 African countries including Rwanda. In Rwanda, it operates under the name Tubura (= to grow exponentially). In Rwanda OAF both works with farmers directly and in collaboration with the Rwandan government to support the agriculture sector. In working with farmers directly, OAF provides seeds and other inputs on credit and extension services to farmers who are organized in small groups who on average farm on an acre of land. Farmers order inputs such as seeds using USSD, after which supplies are delivered to their doorstep. Most farmers grow maize, but OAF also finances inputs for a range of other crops to help farmers diversify their incomes. In Rwanda, OAF employs over 2,700 private extension agents to enroll farmers, distribute inputs, provide extension services, and collect repayments. Repayment rates are north of 90 percent which compares well with other agriculture finance providers. Currently, OAF is redesigning its model, centered around a digital platform. OAF solidified its position as a key seed provider in Rwanda, processing 2,100 metric tons of maize seed. Its partnership with API and Western Seed Company now meets half of the country's demand for hybrid maize seed. In 2021, in collaboration with the Rwandan government, OAF distributed 19.4 million timber trees for free to 1.4 million farmers countrywide, as well as more than 300,000 fruit trees through other channels (AOF, 2023).



### 10.1.5.3. Formal group loans

**Group loans are offered by many U-SACCOs, MFIs and microfinance banks.** A group loan is defined as a loan to a group or individuals within a group whereby group members co-guarantee each other's loans. Typically, members must save a certain percentage of the loan amount prior to receiving a loan. These savings are blocked during the life of the loan and act as a collateral substitute. Urwego Bank probably has the most developed group lending scheme that is tailored to agriculture. U-SACCOs and MFIs also offer group loans.

**Urwego Bank, a microfinance bank and consortium partner, is well placed to offer agriculture lending through its group loans to farmers.** Urwego has 20 years' experience in financing farmers and has 10 percent (RwF 2 billion) of its loan book invested in agriculture. It currently focuses on 4 main VCs: maize, coffee, rice, potato due to the fact that these VCs are well organized. However, it plans to expand to the Serve Project's VCs tomato, green beans, chili and poultry. It has designed the generic products (which will be amended further for the Serve project) and did not start lending yet to these VCs except for poultry. Urwego uses a trust group methodology and offers a crop-based group loan to groups of 20-30 farmers that grow the same crop. The combined land holding of the group should be 1.5 hectares. Loans are uncollateralized and allow for bullet payments. As part of the bank's due diligence for agriculture loans, it looks at off-takers to ensure market. The off-takers agree to an assignment of payment, routing farmers' payments through a bank account [so that the bank can deduct principal and interest], i.e., a form of value chain finance. Urwego also offers mHose, a mobile banking platform with integrated mobile money services, allowing clients to receive and pay loans to the bank through mobile money.

**Several MFIs offer specialized agriculture group products.** According to a recent study (Byansi, 2023), the most active MFIs in agriculture are Umutanguha Finance Company, Duterimbere (16 percent exposure to agriculture), RIM (38 percent exposure to agriculture); and Goshen. RIM and Goshen have been partners of the USAID Feed the Future Nkuriza Nshore project. The most active MFI in agriculture group lending is probably RIM which targets informal groups with its 'credit agri elevage peche assofi' product which allows for seasonal payments. Other MFIs that offer group lending are Duterimbe and Goshen. Some U-SACCOs offer group loans but these are not tailored to agriculture.

### Box 7: Mixed experiences with U-SACCOs

#### **U-SACCOs do not have specialized agriculture products and lending experiences vary.**

The 416 U-SACCOs have 2.8 million members and are present in all sectors (sub-districts) of the country. Combined, the U-SACCOs have an agricultural loan book of RwF 27.4 billion (June 2023), representing 26 percent of the total U-SACCO loan book (BNR, 2023). According to the World Bank's agriculture finance diagnostic, U-SACCOs typically do not have tailored financial products for agriculture, requiring frequent repayments and collateral<sup>224</sup>. While SACCOs may take, livestock, other fixed assets, cash collateral, and group guarantees as collateral, collateral is still been considered as a challenge. Based on focus group discussions, practices differed markedly from one U-SACCO to another. One FGD commented that "you hardly get a loan from the U-SACCO, the charges are high, and a 30 percent cash collateral is required in addition to land and house with a land title". The 30 percent cash collateral requirement appeared in other FGDs as well. Another group said that "terms and conditions for SACCO loans are tiresome, it can take a year to get a loan". Yet another group had a completely different experience, stating that there was no collateral required for loans except for a group guarantee. In one case, a tomato farmer had to present a business plan for a RwF 200K loan which seems preposterous. Typical loan amounts of U-SACCO loans for agriculture purposes are from RwF 100K to 500K.

#### **U-SACCOs' ability to deliver agriculture finance may be hampered by operational issues.**

U-SACCOs are small entities, typically have officers with limited capacity, combined with rather basic lending practices. U-SACCOs face numerous managerial and operational challenges that threaten their ability to evolve into modern, professional and sustainable financial institutions (World Bank, 2018) (RCA, 2018). There are plans underway to automate and merge U-SACCOs into district cooperative banks, but implementation has been delayed. By April 2021, only 33 U-SACCOs had been automated, 8 percent of the total. However, the proposed consolidation of the SACCO sector presents a major opportunity to build up their capacity to offer services tailored to the needs of the agriculture sector.

#### 10.1.5.4. **Loans to co-operatives**

**Banks and MFIs actively lend to co-operatives. For instance, Banque de Kigali, the country's largest bank, channels about 60 percent of their agricultural loans through co-operatives,** with loan sizes ranging from RwF 500 to 800 million. The co-operatives then

on-lend funds to their members, but the cooperative remains the sole counterparty for the financial institution. BPR has specialized accounts for cooperatives with seasonal payment options for inputs (World Bank, 2018). Umutanguha, an MFI, also lends to cooperatives. Loans to cooperatives often require collateral. Finally, the BRD lends to producer organizations in cash crop value chains such as coffee and tea (World Bank, 2018).

#### 10.1.5.5. Value Chain Finance

**Value Chain Finance (VCF) is not very common outside coffee and tea.** Value Chain finance is a tripartite finance mechanism that involves farmers or farmer groups, a (large) off-taker and a financial institution. Typically, the off-taker is an established 'anchor' client of the financial institution and assists the financial institution in identifying upstream farmers. The farmers or farmer groups, who have a delivery contract with the off-taker, agree to assign receivables to the financial institution. The assignment of receivables acts as a collateral substitute. Usually, the proceeds are paid into a special account that is controlled by the financial institution. The benefit to the off-taker is a reliable source of raw materials of a certain quality. The benefit to the farmer is farmer access to finance without collateral. From the financial institution's point of view, it has traded credit risk to many small farmers for performance risk (farmers have to meet the obligations of their contracts) and limited collection risk (it has to collect from the off-taker which is usually a more established company than the farmers). In Rwanda, Urwego Bank, Equity Bank and BPR offer such Value Chain Finance facilities, but outside the established VCs (tea and coffee), it does not appear to be very common.

#### 10.1.5.6. Loans to individual farmers and agribusinesses

**Loans to individual farmers and agribusinesses are offered by MFIs, commercial banks, and BRD.** As stated above, the most active MFIs in agriculture lending are Umutanguha Finance Company, Duterimbere (16 percent exposure to agriculture), RIM (38 percent exposure to agriculture); and Goshen. Individual agriculture loans are all collateralized with traditional collateral. Duterimbe is the only institution that offers a loan product with a BDF guarantee.

**Umutanguha** offers agriculture loans, including seasonal loans, to individual small and large-scale farmers whereby collateral is required (also to associations and

cooperatives). It also offers specific products for women and refugees. It has a network of 23 branches.

**Duterimbe** offers specialized agriculture loans for youth (18-30y) and women (women groups and individuals). Collateral is required but Duterimbe does offer a loan product with a BDF guarantee (Byansi, 2023).

**RIM** offers, aside from its group loans, loans to individuals and companies for agriculture purposes and seasonal payment options.

**Goshen** offers various individual agriculture products and piloted a youth-focused agriculture loan product with USAID support.

**Commercial banks' engagement in agriculture lending is mostly through export finance and financing of co-operatives.** Commercial Banks' exposure to agriculture as a percentage of banks' loan books is low. The most active banks in agriculture seem to be BK and BPR, followed by Equity Bank. In general, banks are mostly financing tea and coffee exports with trade finance products as part of their agriculture lending. BK offers an 'agricultural loan' for professional farmers, to be secured with land (BK, 2023). Equity Bank also has specialized agriculture products (Imsar, 2022).

**The public-sector lender, the Development Bank of Rwanda (BRD), primarily lends to large agribusinesses.** The BRD primarily provides large loans for exporters, agri-processing companies, and producer organizations in cash crop value chains such as coffee and tea.

**Table 48: Summary of delivery models**

Delivery model	Offered by	Advantages (+)	Disadvantages (-)
VSLA	VSLAs, U-SACCOs, MFIs, Urwego bank	No collateral (group guarantee)	Small amounts Short-term Mostly regular payment plans (except Urwego Bank)
One Acre Fund model	OAF	Holistic approach Last-mile delivery of inputs	Only for certain value chains, with a focus on food (security) crops
Individual loan/business loan for working capital and fixed assets	U-SACCOs, MFIs, Banks	Larger amounts Seasonal payments Trade finance	Documentation requirements Collateral

Delivery model	Offered by	Advantages (+)	Disadvantages (-)
Loans to coops	Umutanguha BK Equity Bank	Coops may on-lend funds to members, reaching scale quickly	Not VC finance as such as coop is the counterparty for the FI Collateral may be required
VC Finance	Urwego Bank Equity Bank BPR	No collateral required Ability to impact many smallholders	Highly standardized approach with fixed dates and standardized amounts

### 10.1.6. De-Risking Mechanisms Across Value Chains

**There are two main types of de-risking mechanisms to distinguish: guarantee facilities and agriculture insurance.** Furthermore, there are several innovative collateral substitutes that can and should be considered in agriculture finance loan design.

**Guarantee facilities help financial institutions to de-risk loans to clients with insufficient collateral.** Aside from the BDF guarantee facility that is discussed in section 1.3, such guarantees are offered by FMO Nasira (USD 10 million) to I&M Bank Rwanda and by the African Guarantee Facility to Equity Bank (USD 50 million) scale up its lending activities to women owned and managed MSMEs in Kenya, Uganda, Rwanda ,and DRC, ensuring women are able to access credit. Of the USD 50 million facility to Equity Bank, USD 10 million is allocated to Rwanda. Aceli Africa is a recent initiative to incentivize banks to lend more to agriculture, including a first loss portfolio guarantee. Aceli is a catalytic market facility offering financial incentives to lenders that then provide commercial financing to agricultural SMEs in Rwanda (and other East African countries). Aceli offers origination incentives, portfolio first-loss cover and impact bonuses. Aceli started operations in 2020. To date, Aceli has processed 93 deals in Rwanda through its partners BRD and BPR Bank for a total of USD 23 million, with an average of USD 247K. There is a danger however that guarantee facilities do not enhance lending to agriculture but merely act as collateral replacement or enhancement for loans that the banks would have made anyway.

**Agriculture insurance is an effective de-risking instrument.** Agriculture insurance as offered through NAIS can be an effective de-risking instrument for farmers, but also for financial institutions that lend to farmers. However, as argued in this report, agriculture insurance only reaches a very small portion of the farming population. To effectively work as a de-risking mechanism or even as a collateral substitute, farmers that want to

obtain an insurance policy should be able to do so. Outside NAIS insurers also offer agriculture insurance, but the government subsidy does not apply.

**There are various alternatives to land and property as collateral that financial institutions can use as de-risking instruments.** Such alternatives include financial transaction histories, of which a borrowers' credit histories are most common. Current account turnover can also provide great insight into a borrower's capacity to pay. The same logic, although less often used, applies to savings passbooks or ledgers of VSLAs, and to mobile money transaction data. Such data, if made available to financial institutions, can form a good basis to lend against. Other alternatives to traditional collateral that are relatively easy to offer from a potential borrower's perspective could be group guarantees (for group lending), one or more personal guarantors (for individual loans), biological assets (crops in the field or chickens) in combination with agriculture insurance, the asset that is financed (e.g., irrigation equipment in case of an irrigation loan) and last but not least, a statistical credit score.

## 10.2. Increasing Access to Agriculture Finance for Youth

### 10.2.1. Analysis of barriers to access to agriculture finance for women and youth

**Women actually borrow slightly more than men but rely less on formal sources of credit.** Interestingly, women borrow more than men (77 percent against 76 percent) but more from informal sources, mainly VSLA, shops offering goods on credit and to a lesser extent moneylenders. 18 percent of women borrow from formal sources, against 25 percent of men. The difference is made up by more reliance on informal sources of credit such as savings groups and moneylenders (59 percent of women borrow from informal sources against 51 percent of men). Only 5 percent of farmers (no disaggregated data by gender available) actually borrow for farming purposes; most farming activities are financed by sale of produce or livestock, savings and other incomes. However, women-led MSMEs are more often (formal) credit constrained than men-led MSMEs (38 percent vs 26 percent) (AFI, 2023).

**While informal sources of credit remain important, formal credit has the potential to scale up and offer tailored solutions.** Women and youth borrow mostly from informal sources, i.e., from VSLAs. While loans informal sources (VSLAs and moneylenders) may be convenient, they may be more expensive, not be able to offer loans with higher amounts (e.g., to purchase sufficient inputs) and/ or loans with a longer tenure, for

instance for investments in greenhouses or farm equipment. Hence, below the barriers for women & youth to accessing formal sources of credit are elaborated in more detail.

**A diverse set of barriers limits access to formal agriculture finance for women and youth.**

These barriers can be grouped into the following categories: (1) supply-side barriers: lack of focus on women and youth inclusion by financial institutions, (2) demand side barriers: cultural and societal barriers, lack of collateral, disparity in entrepreneurship between men and women, and limited financial literacy.

**Supply side barriers**

**Banks and other financial institutions lack focus on women and youth financial inclusion and empowerment within institutions' strategic goals and plans.** According to the BNR, one of the key challenges to inclusivity is that most financial institutions lack a gender (and youth) focus in their strategic plans. The lack of customized products that target women's needs for personal and business finance is another challenge, indicating a need for several financial institutions to invest in understanding the women (& youth) market and developing and marketing cost-effective and convenient products. Indeed, according to an AFI report, there is a fundamental mismatch between offerings and the needs of women and women-owned and -led businesses. 38 percent of women-owned MSMEs are (formal) credit constrained, compared with 26 percent of men-owned MSMEs and there remains a lack of choice of financial products and services specifically tailored to meet women's various needs (AFI, 2023). Moreover, national legislation does not explicitly prohibit gender-based discrimination in access to credit (World Bank, 2021).

**Demand side barriers**

**Women face several cultural and societal barriers.** These barriers limit their ability to participate in financial decision-making at the household level, where their male partners or family members may often make decisions alone, particularly financial decisions. In other cases, women may need to get consent from their spouses before taking out a loan or offering collateral that is jointly owned. Time and mobility constraints due to disproportionate care responsibilities often make accessing branches of financial institutions challenging (BNR, 2023).

**Women and youth farmers often lack collateral which is a main barrier to accessing loans.** Numerous studies indicate that collateral, including land, is a main barrier for women to access loans from the formal sector. As mentioned earlier, formal financial institutions have stringent collateral requirements. Results from focus group discussions also revealed that collateral was the number one barrier for women and youth to access loans. Women with joint asset ownership often need consent from spouses, which

may be challenging because of limited agency and existing social norms. According to NISR Statistics (NISR, 2022), 11 percent of all registered parcels of land were owned by women only, 19 percent by men only and 48 percent co-owned (by couples). Youth typically do not own land, and, due to their relatively short engagement in farming or other business, have not been able to build an asset base that could serve as collateral.

**Limited financial literacy and limited education among women hinders access to finance.** Financial literacy is the ability to make informed decisions about financial resources. According to the BNR, women's low financial literacy continues to be a major hurdle for providers and customers alike (BNR, 2023). As to be expected, there is a clear relationship between education levels and financial literacy and behavior: financial inclusion is lower among people with lower levels of education. In Rwanda, 23 percent of women have not received any formal education, against 15 percent of men. The education gap for women exists across all age groups but is significantly higher for women of 61 years and older (60 percent of women have no formal education against 38 percent of men) (Finscope, 2020). A key challenge that was highlighted by almost all financial institutions is women's limited education and awareness about financial services (BNR, 2023). Indeed, women's awareness of financial products is fairly low at 43 percent (compared to 47 percent of men). Similarly, affordability considerations before buying financial products are lower for women than for men. More women than men have experienced a lack of transparency from financial service providers (55 percent of women felt that information on financial products was provided in a clear and transparent manner, against 62 percent of men). The reasons that female non-borrowers give for not taking loans may also point at limited financial literacy. Aside from not needing a loan (38 percent) one of the main reasons for not taking a loan is because women indicated that they had concerns about being unable to pay their debt (34 percent), despite the fact their rate of non-performing loans is similar or lower than that of men (AFI, 2023).

**Disparities in entrepreneurship between men and women may be explained by the same factors that limit access to finance.** While women in Rwanda account for just over half the population and have the same legal rights as men to sign contracts, register businesses, and open bank accounts, they remain underrepresented in the formal MSME sector and account for only one third of registered enterprises, of which about 60 percent are either micro or small. According to the Women & Youth Access to Finance strategy, women and youth entrepreneurship culture remains weak, which in turn limits their ability to save and invest (MIGEPFOP, 2016). Entrepreneurial skills and success are influenced by a complex interplay of social, economic, cultural, and individual factors. Disparities in entrepreneurship between men and women in Rwanda due to a combination of structural and cultural factors that affect opportunities for both genders



differently, including societal norms, education levels, lack of networking opportunities (AFI, 2023), and, indeed, access to finance itself. Gendered social norms also affect women entrepreneurs. It is a struggle to convince others, be it their husbands or community, that women start their own business and not spend more time in the home. According to a recent survey on gendered social norms, 71 percent of Rwandans in rural areas think that women shouldn't start their own business if they have children (The Banker, 2023).

## 10.2.2. Recommended Policy Enhancements and Interventions

**To fix women and youth access to agriculture finance, agriculture finance itself needs to be fixed first.** Rwanda's commendable progress on financial inclusion is to a large extent a result of a coherent set of proactive, best-practice policies. Thus, this report does not have any recommendations related to existing policy documents which all point in the right direction: towards 100 percent financial inclusion, including for women and youth, and mentioning increase in agriculture finance as a priority. However, based on actual levels of agriculture finance at below 1 percent (measured as a percentage of the aggregate loan book) against the 10 percent target that was set for 2024, additional measures are called for to stimulate agriculture lending. Thus, the first policy enhancement addresses supply of agriculture lending at large, followed by specific policy enhancements for women and youth.

**Rwanda's Central Bank should consider setting minimum exposure targets for agriculture lending for banks and non-bank financial institutions (e.g., 15 percent of the loan book).** Such a minimum exposure target is usually set as a percentage of a financial institution's loan book, sometimes referred to as priority sector lending targets (ACEI Africa, 2022). Examples of countries where such targets and policies exist for agriculture lending are India, Nigeria, Brazil, China, and Bangladesh. For instance, India's target for agriculture lending is 18 percent. There is also a 12 percent target for 'weaker sections' which includes small and marginal farmers (Banking Digests, 2023). Both targets are part of an overall priority sector lending target of 40 percent for banks (and 75 percent for regional rural banks and small finance banks). Any bank having a shortfall in lending to priority sectors pays the difference as a contribution India's Rural Infrastructure Development Fund (RIDF) or other funds as decided by its Central Bank (ACEI Africa, 2022). Similarly, commercial banks in Nigeria are required by the Central Bank to allocate a portion of their loan books to the real sector of the economy, including agriculture. Such a program could be phased in slowly to give financial institutions time to adjust. Finally, it could also include sub-targets for loans to women and youth farmers.

**In addition to BNR's 'Guidelines to Women's Financial Inclusion - Actions for Financial Institutions', BNR should consider issuing similar Guidelines for Youth financial inclusion and perhaps for lending to smallholder farmers.** The Guidelines to Women's Financial inclusion are very practical and hands-on and are a clear call for action for financial institutions. It is recommended that the BNR issues similar 'Guidelines to Youth Financial Inclusion' which will encourage financial institutions embrace youth financial inclusion as part of their strategies, develop youth-inclusive financial products and bring these to market. Finally, similar to Nigeria's Central Bank 'Anchor Borrowers program Guidelines', the BNR could consider issuing guidelines to encourage lending to smallholders (CBN, 2021).

**Financial literacy efforts need to continue to target women and youth, paying special attention to usage of mobile money and agriculture insurance.** Financial literacy programs should specifically target women and youth farmers, and first and foremost focus on the role of credit in farming-as-a business. In addition, such program should pay special attention to the use of mobile money services by (older) women which is a prerequisite for enabling the use of digital financial services. For instance, it is noted that while 84 percent of women have access to a mobile phone, only 55 percent of those women have a mobile money account, mainly due to lack of knowledge (The Banker, 2023). Finally, a significant financial education effort is called for when it comes to agriculture insurance which has huge potential as a de-risking mechanism. Finscope research indicates that knowledge of agriculture insurance is low, which may explain low uptake (Finscope, 2021).

### **10.2.3. Suitable Delivery Models and Products for Increasing Access to Agriculture Finance for Youth**

**Suitable delivery models for improving access to finance for women and youth should focus on embracing technology as an enabler, inclusive product design and promoting linkages between VSLAs.** While the gender gap is narrowing for financial inclusion as a whole, there is still a gap when it comes to formal financial inclusion and in particular in accessing agriculture loans from the formal sector.

**Digital financial services offer opportunities for both women and youth financial inclusion.** Digital financial inclusion offers opportunities to increase youth and women's financial inclusion because of ease of access and innovative digital products. This is particularly relevant for women's financial inclusion, given the widely documented fact that women have lower mobility and less free time, so they transact in a narrower geographic range than men (BNR, 2023). Even though women have reduced phone

access and lower financial literacy, especially older women, women greatly prefer DFS (BNR, 2023). Similarly, DFS can build on the fact Rwanda has a relatively young (farming) population (41 percent of farmers is under 30) and these youth have high penetration and usage of mobile devices to manage their financial needs (Finscope, 2020). All in all, this presents an opportunity in adopting technology as an enabler for financial inclusion and usage. At the same time, as stated above, education programs are needed to ensure that also older women become active users of digital financial services.

**Youth and gender inclusive financial product design needs to move away from relying on traditional collateral.** Numerous studies and FGDs indicate that collateral is the main barrier for women to access loans from the formal sector. As a matter of principle, agriculture finance products targeted at women or youth should not include traditional collateral as this cannot be readily offered by women and youth borrowers. At the same time, it is not realistic to rely on guarantee facilities such as BDF as in practice they only benefit very few farmers (201 farmers in 2020) and are not built to scale. Hence, the solution should be sought in further promotion of collateral free loan products such as group loans, value chain finance and/ or relying on alternative forms of collateral as mentioned in section 8.1.6., such as biological assets as collateral in combination with agriculture insurance and credit scoring.

**Linkages between VSLAs and financial institutions should be promoted.** Given that many women are already a member of a VSLA, linkages between VSLAs and financial institutions should be strengthened. CARE and other consortium partners can play an important role here. As part of the referral process, savings and credit histories of VSLA members should be made available to the financial institutions (MFIs and U-SACCOs mostly) in a format that is palatable to the financial institutions so that this transaction history makes members bankable and perhaps acts as a collateral substitute.

## **10.3. Policy Entitlements for Value Chain Operators**

### **10.3.1. Identification of Existing Agriculture Policy Entitlements**

**Four main types of policy entitlements can be distinguished for small-scale farmers, including women and youth: extension services, input subsidies, irrigation equipment subsidies and access to certain de-risking instruments including insurance.** In addition, access to certain donor-driven programs could be viewed as policy entitlements.

Extension services consist of the Twigire Muhinzi system, input subsidies are granted through the Smart Nkunganire System (SNS) while irrigation equipment subsidies are made available through the Small-Scale Irrigation Technology (SSIT) subsidy program. Access to financial services includes first and foremost subsidized agriculture insurance through NAIS and access to the BDF guarantee facilities.

**Twigire Muhinzi is Rwanda's nationwide, decentralized farmer-oriented system for delivering agricultural extension and advisory services.** It was designed with the specific goals of maintaining national food security, improving crop productivity, increasing farmers' income, and improving livelihoods (FAO, 2021). The extension system is based on two complementary types of farmer-to-farmer extension approaches: the farmer-promoter approach and the Farmer Field School (FFS) approach. The farmer-promoter approach has farmers organized in Twigire groups supervised by farmer-promoters. In these groups, farmers have access to basic extension messages and information through demonstration plots in each village. The groups meet three times per season, during which they are trained on Good Agriculture Practices. The FFS approach aims in part to gradually reach all farmers with in-depth knowledge by offering an experimental learning experience in FFS plots. Farmers are organized in FFS groups facilitated by a trained FFS facilitator, and they meet every week. Based on an FAO report, there are 14,200 farmer promoters and 2,500 FFS facilitators who train farmers groups (FG) through demonstration plots, field days and village meetings (FAO, 2021). As of 2016, almost 60,000 farmer groups composed of just over a million farmers countrywide who access extension and advisory services through Twigire Muhinzi. Likely, the numbers are significantly higher now. On the downside, the Twigire Muhinzi programme focuses on specific crops. For example, in Rubavu, the FGDs indicated that they focused on a few crops such as carrots, cabbage, bitter roots and onions.

**Agriculture input subsidies are allocated through the innovative Smart Nkunganire platform.** The platform, which is described in Box 8 below, is widely used by crop farmers to access to fertilizers (NPK, DAP and Urea) and seed (mostly maize seed) at subsidized rates. However, only crops under the Crop Intensification Program (CIP) fall under the input subsidy scheme: maize, wheat, rice, Irish potato, beans, and cassava. Data from BK TechHouse indicates that 2.5 million farmers have registered on the platform, with over 1,900 retail agro-dealers as well as 36 fertilizer and seed (agri-SMEs) companies. Over 131,380 MT of agriculture inputs are distributed annually by the platform for a value of RwF 85 billion (BK Techouse, 2023).

### Box 8: Smart Nkunganire System (SNS) Platform

SNS is a platform that digitizes the input supply chain. SNS is a joint effort to digitize Rwanda's national agri-inputs subsidy management under a public-private-partnership (PPP) agreement between BK TechHouse (a subsidiary of Bank of Kigali) and RAB. The platform targets end-to-end digitization of the agri-input supply chain management under Rwanda's Agri-Input Subsidy program and bridging the communication gap between all the stakeholders involved in the agriculture sector. The platform targets all actors involved in the end-to-end supply chain of the agriculture sector and intends to add more business value to the agriculture sector (SNS, 2023).

SNS enables farmer self-registration capability to allow the application for subsidized agro-inputs on time using a USSD short code, this process provides visibility on agro input demand, cultivated land size, yield in the previous season.

In the future, SNS is aiming to de-risking agriculture through integrated financial services via credit scoring service and risk assessment to financial service providers. With the help of big data analytics, the system would be able to facilitate the loan eligibility assessment for small holder farmers. Hence increasing the farming capital, ultimately positively influencing the yield production. There is also talk of NAIS being integrated into the SNS system.

Source: (SNS, 2023).

**The Small-Scale Irrigation Technology Subsidy (SSIT) program aims at supporting small-holder farmers in acquiring irrigation equipment.** The program was launched in 2015 with the goal of developing 25,000 ha of irrigated land by 2024 (Resilience, 2023). The main component of the SSIT program is the provision of a 50 percent subsidy for farmers to acquire ready-to-use irrigation kits (pumps and water distribution technologies) for 1, 5, and 10 ha from approved suppliers. SSIT irrigation sets typically cost between USD 3,500 to 6,000 per Ha. The idea is that subsidized access to affordable irrigation technologies will alleviate the impacts of climate change-induced droughts and increase the agricultural productivity of smallholder farmers in Rwanda (Resilience, 2023). According to Rwanda's Irrigation Masterplan, SSIT should be one of the priorities as it has proven to be a great benefit to the farmers (RAB, 2020). The SSIT program is coordinated by RAB and funds are earmarked to selected districts.

**BDF guarantees should ease access to finance while agriculture insurance protects farmers against agriculture risks.** The BDF guarantee, which is described in more detail in section 8.1.4.1. should act as a collateral substitute for those farmers that do not have

sufficient collateral. The agriculture insurance that is provided under NAIS can protect farmers against agriculture production risk and carries a 40 percent government subsidy. Related to NAIS, it must be noted that its coverage is limited to certain crops and livestock sectors. For instance, tomatoes, which is a priority VC under the Serve project, is not covered by NAIS. Agriculture insurance is described in more detail in section 8.1. while the section 8.3.2. contains details on exploitation levels.

**Some members of focus group discussions benefited from various government or donor projects.** Examples of groups or cooperatives that benefited from projects include a matching grant from OXFAM, greenhouses from a government program, washing facility and cold room for vegetables from different donors. However, at least as many groups had not received any support (other than extension, input subsidies or NAIS subsidy) through a government or donor program.

### 10.3.2. Exploitation Levels and Bottlenecks Encountered

**Extension services and input subsidies seem to be widely used while other policy entitlements are much less common.** The exploitation levels are estimated as follows. First, exploitation levels are first estimated based on literature reviews and calculations. Second, exploitation levels are commented on based on findings from the field work. These findings are elaborated in the remainder of the paragraph.

**Table 49: Exploitation levels for policy entitlements**

Policy entitlement	Program	Estimated number of beneficiaries	Comments from the field
Extension services	Twigire Muhinzi	1 million (60,000 groups)	Most farmers receive extension services which are largely appreciated
Input subsidies	Smart Nkunganire	2.5 million	Practically all farmers receive input subsidies and are satisfied
Irrigation equipment subsidies	SSIT	45,000 <sup>225</sup> (since inception)	None of interviewed FDGs/ farmers received SSIT support

<sup>225</sup> According to the 2021-22 annual report of the ministry of Agriculture, 22,073 Ha was under irrigation due to SSIT. Assuming 0.5 Ha per farmer, the number of beneficiaries can be estimated at 44,146 (45,000 rounded)

Policy entitlement	Program	Estimated number of beneficiaries	Comments from the field
Agri Loan guarantee	BDF	201 (2020) 148 (2019)	Only 1 BDF guarantee encountered during field-work
Agriculture Insurance subsidy	NAIS	75,000 to 80,000*	Only encountered poultry farmers that were insured
Other donor/ government programs	Various		Erratic access with information and transparency issues

\* See table and calculation below

**Table 50: Number of animals and Ha insured under NAIS**

Livestock/ crop	Achieved 2021-22	Achieved 2020-21
Chicken	163,124	109,630
Cows	35,517	24,144
Pigs	3,477	2,378
Rice (Ha)	22,047	23,957 Ha
Maize (Ha)	4,730	
Irish potato (Ha)	1,028	
Green bean (Ha)	10	
Chili (Ha)	162	
Total	27,977 Ha	23,957 Ha

**The number of NAIS Beneficiaries is estimated between 75,000 and 80,000.** Based on data in Table 50 the number of NAIS users is estimated at around 78,000 farmers, including just a few farmers in green beans and chilis, which is consistent with field work findings where the farmers that were insured were poultry farmers. On a positive note, both the number of animals and the number of hectares has increased year-on-year which points at increased uptake.

**It must be stressed that all policy entitlements are costly interventions and rely on budget support.** All the policy entitlements discussed here are cost-intensive and further rollout is likely to be constrained by availability of government and/ or donor funding. For instance, according to an FAO report, the main limitation of the farmer field school approach is its high cost (FAO, 2021). Intense training activities are expensive in terms of cost incurred per farmer trained; and the number of farmers that are trained

countrywide each season is constrained by available financing and usually results in a smaller number of trainees per season compared to the planned number. Likewise, input subsidies are a huge drain on the budget. According to various estimates, fertilizer subsidies alone cost around USD 15 to 20 million per year. Each SSIT subsidy costs the government USD 1,750-3,000 per hectare. On a positive note, the World Bank CDAT program contains funding for NAIS, including a target to scale it up to 650,000 farmers, about an eight-fold increase. Without exception, policy entitlement projects and budgets that are under the Ministry of Agriculture's budget are expensed for 100 percent which may point at rollout being budget constrained.

**Practically all farmers receive subsidized inputs through SNS (despite it being restricted to certain crops) and are generally content.** Overall, focus group discussions and interviews with individual farmers confirm that practically all farmers make use of input subsidies. One farmer commented that “*there is no farmer today who does not use the SNS platform*”. Given the fact that the input subsidy program only applies to strategic food crops and does not apply to the VCs that are promoted by the SERVE program, it seems that most farmers grow a food crop (maize, wheat, rice, Irish potato, beans, and cassava) in addition to tomato, chilis, green beans or engage in poultry. It cannot be excluded that certain subsidized inputs (e.g., fertilizer), are (partially) applied to other crops. Overall, farmers' experience with the input subsidy program was very positive, with only very few farmers commenting on the delays in receiving inputs, or on receiving less inputs than expected.

**Regarding extension services, there is general appreciation but also some points for improvement.** Most farmers that were interviewed extension services under the Twigire Muhinzi extension program. While the services were appreciated, farmers lamented that their preferred crops (e.g., crops promoted by the SERVE project) were not covered by the extension services. Hence, it should be explored if the farmers under the SERVE project can benefit from a change in training curriculum that, going forward, could include tomato, chilis, and green beans. Other critical remarks related to farmer promoters and FFS facilitators did not devote sufficient time to their role as promoters or facilitators because they were pursuing their own projects, leading to less effective extension services. Yet others appreciated the ease of access and availability of “their” farmer-promoters.

**The SSIT uptake is impacted by technical issues and access to finance.** According to a recent evaluation by Resilience B.V, a consultancy, the main constraints related to SSIT uptake were found to be lack of funding, land tenure security, water permit requirements, the cost of equipment and access to finance: (given a 50 percent subsidy, a farmer still has to finance between USD 1,750 to USD 3,000 per hectare plus working



capital for growing crops under irrigation); quality of provided equipment and materials<sup>226</sup> and finally, the application process and transparency of the program itself.

**Uptake of the BDF agri guarantee facility is impacted by bureaucratic processes and perhaps by limited resources.** Notably, in 2020, the last year for which data are published, only 201 agriculture loan guarantees were granted by the BDF. As described in section 8.1.4.1, the BDF guarantees are not designed as portfolio guarantees. Rather, each loan needs to be approved on a one-by-one basis. Banks and AMIR commented that the process was bureaucratic. While in fact many of the farmer groups and women groups that were interviewed had accessed loans from the formal sector (including U-SACCOs), and just one of these loans was guaranteed. To reach large numbers of farmers, the BDF facilities would have to be redesigned, and probably more funding to back the guarantees should be made available. From the focus group discussions and farmer interviews, only one farmer actually received a BDF guarantee.

**The NAIS faces challenges and limitations and reaches only a fraction of farmers in Rwanda.** There is lack of awareness and trust among crop farmers related to agriculture insurance. Interviewed crop farmers commented on the lack of information on NAIS and crop insurance. Also, the high cost of the product can be prohibitive. After the 40 percent subsidy, still 60 percent must be paid, with remaining premiums of around 6 percent. The complexity of insurance products scares potential customers away. Moreover, the main and preferred product in the market today is a multi-peril crop insurance which requires frequent field inspections and, according to insurance experts, is not scalable. Based on own calculations, approximately 78,000 farmers use agriculture insurance. On a positive note, most interviewed poultry farmers were actually insured. A major game changer may be the recently approved World Bank CDAT program which intends to increase the number of beneficiaries of NAIS to 650,000.

**Based on Focus Group Discussion outcomes, access to donor and government projects is erratic due to limited information and transparency.** Members of FGDs complained consistently about the general lack of information on donor and government projects (other than extension programs and input subsidies), and about project eligibility criteria. It was said that most projects have their own, pre-set targets and plans, and it may be difficult for groups or individuals to fit in and be part of such a project. Members that applied for a certain program were informed that they were not selected but a reason was not given. Criteria such as age (e.g., up to 35 years old, targeting youth) or type of

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<sup>226</sup> For instance, the Irrigation Masterplan comments that the quality of lining for small reservoirs “proved to be sub-standard and was not UV radiation resistant resulting in a life span of only one or two years when it should last more than 10 years”.

VC actor (off-taker instead of producer), however well-intentioned, are not easily accepted by members.

### **10.3.3. Recommendations for Intervention/Enforcement Approaches to be Deployed Along SERVE Implementation To Close Identified Gaps And Maximize Policy Entitlements**

**Financial education/ awareness of policy entitlements is much needed.** SERVE consortium partners should ensure that financial education programs to farmers, especially to women and youth, raise awareness on the existence and potential benefits of various policy entitlements, including government and donor programs. In addition, 'coaches' could be appointed that assist farmers in applying for, accessing, and reporting on such entitlements.

**If possible, SERVE should try to influence the content of Twigire Muhinzi to include the VCs/ crops under the project.** The consortium should explore if it is possible to adjust the content of the extension program to include at least its 3 crops (chili, tomatoes, and green beans), perhaps on a cost share basis with the government/ RAB. If not, the consortium would have to establish its own extension and training program for its VCs.

**Given the need for matching funding and limited reach of the SSIT program, loan product design under the SERVE project should also cater for irrigation loans.** Irrigation loans could either finance the remaining 50 percent of the SSIT facility, or finance a complete set of irrigation equipment. Such loans would normally have a longer tenor than seasonal input loans and could be collateralized with the asset that is being financed, i.e., the acquired irrigation equipment.

**Effort should go into designing collateral-free loans rather than bet on BDF's facilities.** The BDF facility, as documented in this report, is simply not set up to process and issue guarantees to thousands of small farmers. Hence, rather than assuming the BDF facility will solve its problem, maximum effort should be put into designing loans that are collateral free.

## **10.4. Environmental Policies and Climate Adaptation**

### **10.4.1. Analysis of Environmental Policies and Climate Adaptation Plans**

**Vision 2050**

**Vision 2050 envisages Rwanda as a developed food secure country, with a strong services sector, low unemployment, and low levels of poverty.** It is a country where agriculture and industry have a minimal negative impact on the environment, operating in a sustainable way, and enabling Rwanda to be self-sufficient regarding basic necessities. By 2050, development will be achieved with low carbon domestic energy resources and practices, reducing Rwanda's contribution climate change while allowing it to be independent of imported oil for power generation. Finally, Rwanda will have the robust local and regional knowledge to be able to respond to changes in the climate, in a position to support other African countries as a regional services hub (RoR, 2020).

**Vision 2050 stresses the need for sustainable use of natural resources and building resilience to climate change.** As part of the aim of attaining higher living standards and quality of life, Vision 2050 states that growth and development will follow a sustainable path in terms of use and management of natural resources while building resilience to cope with climate change impacts. Under pillar 3 on agriculture wealth creation (one of the 4 pillars of Vision 2050) a key priority is 'modern market-oriented and climate resilient agriculture'. These aspirations be embedded in Rwanda's long term Green Growth and Climate Resilient Strategy (see below).

### **Rwanda Green Growth and Climate Resilience Strategy (GGCRS)**

**The Rwanda Green Growth and Climate Resilience Strategy (GGCRS) defines a development pathway for Rwanda that is climate resilient and harnesses green economic innovation.** To achieve a climate resilient and green economic future, the GGCRS is built around four thematic program areas: (1) Green Industrialisation and Trade; (2) Green Urban Transition and Integration; (3) Sustainable Land Use and Natural Resource Management; and (4) Vibrant Resilient Green Rural Livelihoods, of which the latter is most relevant to this report. Indeed, agriculture will continue being a key contributor to economic growth and resilient rural livelihoods. Key elements of the strategy towards this pillar are (1) a focus on climate resilient seeds, (2) and improved on-farm water management (RoR, 2022).

**Access to climate-resilient seeds and animal breeds for smallholders is key in the transition to climate resilient agriculture.** Currently, the Rwandan seed sector is dominated by farmer-saved seed which produces low yield and is vulnerable to the effects of climate change. Increasing smallholder access to good quality, climate resilient seeds is recommended for enhancing crop yields and supporting greater food security, balanced nutrition, improving the value of the product in the market, and contributing to economic growth. Further, to cope with the effects of climate change and variability, Rwandan agriculture will also need to focus on promoting high quality animal breeds that are able to cope with climate change. The private sector must play a more active

role in improving crop varieties and animal breeds, including those with climate-resilient traits. The GGCRS calls for policy reforms to shift the role of the governmental seed regulatory system from direct supervision of seed production towards technical and policy support to the private seed industry. Finally, the CCRS underlines the importance of access to micro-finance and risk sharing.

**Improved on-farm water management including irrigation also plays an important role in enhancing climate resilience.** Rwanda's agriculture is highly rainfall dependent. As a result, crop and livestock production is vulnerable to water-related stress, and water scarcity leads to significant productive losses. Irrigation is key to addressing water stress, but it will only deliver its full potential if combined with proper soil management techniques (and quality seeds). Providing access to water to farmers will be critical in the face of a changing climate and will require more effective and efficient ways to capture water in both downhill marshland systems and hilltop crop production. This can be accomplished through a combination of measures such as: (i) increasing the capacity of on-farm water harvesting and storage; (ii) expanding and modernizing irrigation infrastructures; (iii) enhancing soil moisture retention capacity; (iv) drainage and flood management; and (v) energy efficient and solar pumping.

**Financing the GGCRS will be driven by the Rwanda Green Fund (FONERWA).** The Green Fund, also known as FONERWA is a national Basket Fund and thus an instrument to streamline and rationalise external aid as well as to facilitate direct access to international environment and climate finance. Access to the Green Fund is open to public institutions, NGOs, and private entities, including businesses, civil society and research institutions. The fund's main backers are the GoR, (former) DFID, KfW and UNDP. When launched, it was one of the first national environment and climate change investment funds in Africa. The fund has 3 main instruments: a grant (for public institutions and NGOs), an innovation grant (performance-based grant for the private sector) and a credit line jointly with BRD at a subsidized interest rate (Green Fund, 2023).

### **The National Environment and Climate Change Policy**

**The National Environment and Climate Change Policy is a high-level document that provides strategic direction in environmental management and climate change adaptation and mitigation.** The key issues and challenges identified that are relevant to agriculture include water, air and soil pollution, land degradation, irrational exploitation of natural ecosystems, among others. While agriculture is recognized as one of the critical sectors and interfaces with some of the issues above, the document does not go into much detail on the agriculture sector. Of the seven formulated policy objectives, the two relevant ones are objective 2 on 'enhancing functional natural ecosystems and managing biosafety' and objective 4 on 'promoting climate change adaptation,

mitigation and response'. Under objective 2, the policy calls for teaching of ecological agriculture at all levels, the promotion of sustainable farming practices that suit the holistic nature of local agricultural practices, and are inclusive of economic, social, cultural and gender considerations and strengthening the implementation of sustainable water management practices. Under objective 4, the policy calls for mainstreaming the sustainable use and conservation of ecosystems in the daily operations of productive sectors, including agriculture.

#### 10.4.2. Practical Interventions for Female Youth in Prioritized Value Chains

**Recommended interventions that are in line with environmental policies have the overall objective of making women and youth farmers more resilient to the effects of climate change.** Based on Rwanda's environmental policies, the focus should be on training women and youth farmers on sustainable agriculture practices and to promote the use of drought-resistant seeds and irrigation.

**Training women and youth farmers in sustainable agriculture practices is crucial.** In order to increase resilience to the effects of climate change, training women and youth farmers in sustainable, climate smart agriculture practices is a priority. Training should include the use of drought resistant seeds/ planting materials, use of organic fertilizer, modern tillage, on-farm water management etc. Such training could effectively be channeled through Twigire Muhinzi if it extends to SERVE's VCs, else it should be integrated in SERVE's own training and extension program.

**Women and youth farmers need access to drought resistant seeds to adapt to climate change.** Access to drought-resistant seeds, planting materials and livestock breeds that are able to cope with the effects of climate change has two aspects: (1) availability of such seeds, planting materials etc. and (2) ability to acquire seeds. The availability of such seeds is probably more a role for the government in coordination with input suppliers. However, Care/ the Serve project could consider an intervention to ensure 'last mile' or 'doorstep' delivery of such seeds. The One Acre Fund's success demonstrates the importance of overcoming the last mile hurdle in input delivery. To ensure that farmer can acquire inputs, seasonal agriculture loans can play an important role here and can be directional. Perhaps SERVE's consortium partners could consider applying interest rate subsidies only to input loans that used to acquire climate smart inputs.

**On farm water management needs to be promoted.** Given that rainfall patterns are becoming more irregular, the importance of on farm management has increased. The most immediate, practical improvement in on-farm management that is particularly relevant to the VCs in the Serve project is irrigation, ideally driven by solar pumps. Such

pumps and pipes could be financed with two-to-three-year loans from SERVE's consortium partners (Urwego Bank and AMIR Members. Another key investment in adapting to climate change may be shade nets or greenhouses and similar longer term financing options could be considered for these assets.

## 10.5. Key Findings and recommendations

### 10.5.1. Overview of key recommendations

**Throughout this section, several key themes emerged around financial inclusion and access to agriculture finance, access barriers for women and youth, policy entitlements and dealing with the effects of climate change which call for an integrated set of recommendations.** First, while financial inclusion is very high with almost gender parity, the level of agriculture finance in Rwanda is very low, even by sub-Saharan Africa standards. Second, there are specific barriers for women and youth in accessing agriculture finance that need to be overcome. Third, policy entitlements do not seem to be fully aligned with the Serve project target VCs and information seems to be a major barrier to access policy entitlements. Fourth, to build resilience against the effect of climate change, access to climate adaptation mechanisms needs to be integrated in the overall project approach.

**First, to increase the overall level of agriculture lending, the BNR should be persuaded to set sector lending targets.** While the NST1 set a target of 10 percent of the financial sector's loans being allocated to agriculture, the current percentage is closer to 1 percent. To be able to increase access to agriculture finance for women and youth, the overall supply of agriculture finance needs to increase as well. This could be achieved by two main measures: first, the BNR should set priority sector targets for agriculture lending, and perhaps for smallholder farmers and women and youth as well. The BNR should also consider issuing 'Guidelines on youth financial inclusion, similar to the recently issued 'Guidelines for Women Financial Inclusion'.

**Second, barriers that women and youth face in accessing agriculture finance can be addressed through financial education, promotion of digital financial services, innovative collateral-free product design, and fostering linkages between the informal and formal financial sectors.** Women have higher access levels than men to informal finance but lower access to formal sources of finance. Formal sources of agriculture finance have the advantage that these can often be offered at terms and conditions that better fit the specifics of agriculture lending such as seasonal repayment options.

Barriers to accessing agriculture finance can be overcome first and foremost by holistic financial education programs that should focus on overall financial literacy, how to access agriculture loans, mobile money usage etc. Second, digital financial services, especially mobile money, can ease access to financial services, for instance by allowing for loan repayments through mobile money services, but also by enabling the ability to save using a mobile money wallet.

**Box 9 – Why SERVE should encourage use of existing digital finance infrastructure rather than the development of fully digital loans**

Designing and bringing a digital loan product (e.g., a digital input loan) to market is a capital and time-intensive trajectory. A fully digital loan would allow for filing a loan application through USSD, instant approval (within minutes after applying) while allowing for disbursement and repayment through a mobile wallet. Instant approval requires the use of statistical scorecards, which is still in its infancy in agriculture lending and would require significant preparatory work. Also, such an investment would require significant scale which the SERVE project will likely not be able to generate. Moreover, disbursement and repayment through mobile wallets is already widely available in the market at low cost and it is straightforward to integrate disbursements and repayments through mobile wallets.

The only viable route to digital lending is that if and when digital loans become available on the SNS platform, SERVE can explore if it can facilitate the integration of its partner financial institutions into the platform.

Third, given the bureaucracy and limited scale of agri guarantee facilities, the emphasis should be on designing collateral-free loans rather than seeking for formal collateral substitutes. Fourth, linkages between VSLA and formal financial institutions should be scaled up.

**Box 10 – Why SERVE should not establish a credit guarantee facility**

Developing collateral-free agriculture loan products is deliberately recommended over the alternative of SERVE establishing a credit guarantee facility that would act as a collateral substitute. Establishing a credit guarantee facility requires specific expertise and is complex and expensive to manage, creates bureaucracy for the financial institutions and often creates perverse incentives such as moral hazard and adverse selection. For instance, the financial institution may utilize a guarantee facility to add security to an already secured loan, deliberately lend to clients who have insufficient repayment capacity, or apply less vigorous collection efforts on

guaranteed loans. Similarly, if clients know that loans are guaranteed, they may be laxer in repaying their loans.

**Third, financial education/ awareness of policy entitlements is much needed, combined with an attempt to influence the content of extension programs to include SERVE's priority VCs.** SERVE consortium partners should ensure that financial education programs to farmers, especially to women and youth, raise awareness on the existence and potential benefits of various policy entitlements through education programs, perhaps complemented by appointing 'coaches' that assist farmers in applying for, accessing, and reporting on such entitlements. And if possible, SERVE should try to influence the content of the Twigire Muhinzi extension program to include the VCs/ crops under the project.

**Fourth, increasing farmers' resilience against the effect of climate change must be woven into all aspects of the project.** Rwanda's environmental and climate policies identify key areas for action, related to access to improved inputs and better on farm water management. Increasing resilience touches on many aspects of the project. It is about access to drought resistant seeds, training and extension services, access to the SSIT program, but also about designing irrigation loans, an issue that has been overlooked until now.

### 10.5.2. Opportunities and entry points for the Serve project to increase access to finance for women and youth

**Overall, the envisaged access to finance program should work as follows.**

Women & youth undergo a **comprehensive financial education program** that prepares them, among other things, for accessing agriculture finance, Digital Financial Services, agriculture insurance and other policy entitlements and at the same time raises awareness about the effects of climate change.

In the meantime, carefully selected financial institutions from among AMIR's members (Partner Institutions) would have **developed collateral-free agriculture loan products** that are easily accessible to women and youth, for instance by allowing for disbursements and repayment through mobile money. Women and youth would have **different pathways to accessing agriculture loans**, either by applying directly with a Partner Institution with newly developed loan products, or through a linkage program between 'their' VSLA and a Partner Institution, or perhaps by joining a VSLA as a first step towards financial inclusion. At the same time, a support system consisting of **coaches** needs to ensure that project participants have ready **access to policy entitlements**.



Aside from access to agriculture finance, women and youth farmers will need **access to improved seeds and irrigation solutions**.

To achieve the above, the following needs to be done:

1. Design and implement a comprehensive, holistic financial education program
2. Implement loan design projects with carefully selected Partner Institutions
3. Expand and scale up linkage programs between VSLAs and Partner Institutions, whereby the financial history of each VSLA member is recognized as part of the member's credit profile.
4. Advocate and coordinate: Advocate with BNR, NAIS and RAB in support of agriculture lending, insurance, and extension programs; and establish coordination mechanism with other large projects and stakeholders,

### 10.5.2.1 Comprehensive education program

Many proposed recommendations in this report have a financial education or training element. Rather than to address these education/ training needs in silos, it is recommended that all education/ training needs are included in a **major training program targeted at women and youth in Serve's Value chains**. At a minimum, based on the findings of this report, the program should address the following:

- a. Financial literacy, including for digital finance (digital financial inclusion is low in Gakenke and Nyabagabe Districts and DFS should be specifically promoted in these districts).
- b. Insurance literacy, including on how to sign up for NAIS.
- c. Basics of agriculture finance, including different types of products that addresses different types of needs.
- d. Where and how to apply for agriculture loans.
- e. Effects of climate change and how to adapt (importance of improved, drought-resistant seeds, on-farm water management including irrigation).
- f. Overview of different policy entitlements, donor, and government projects and how to apply / gain access.

Optionally, given that women entrepreneurs face specific cultural and societal barriers, a training component could be added, targeted at families and households, to work towards a supportive environment for women entrepreneurs.

In terms of immediate actions, it is recommended that such a financial education program is either developed in-house or outsourced. If outsourced, a Terms of Reference needs to be developed and project funding needs to be identified. The developed financial education program needs to be succeeded by identification and training of trainers, and a training rollout plan. The identified trainers could also double as coach for women and youth groups to support them in enrolling in certain government and donor programs (policy entitlements).

### 10.5.2.2. Partner selection and loan design

It is recommended that from among AMIR's members, a careful selection is made to identify a few Partner Institutions, ideally not more than three in addition to Urwego Bank. Hence, preference should be given to financial institutions that jointly have sufficient geographical coverage to cover the entire 10 project districts. At a minimum, these institutions should be profitable, be in compliance with BNR capital and other requirements, have a track record in agriculture lending and have good internal control systems in place. Aside from microfinance banks and MFIs (including SACCOs), One Acre Fund Rwanda (operating under the Tubura brand name) could also be considered as a partner given its impressive track record, including in seed delivery. However, OAF/ Tubura focuses on maize, complemented with some commercial crops for income diversification purposes, and compatibility with SERVE's priority VCs needs to be explored further. Each SERVE partner financial institution should be willing and able to offer at least two out of three of the loan products that are listed below. These products will have three main characteristics: (1) they are collateral-free, i.e., they do not require traditional collateral in the form of land, properties, and vehicles; (2) they allow for mobile loan repayments, greatly easing the burden on especially women to travel to a financial institution to make a loan repayment; (3) an interest subsidy applies (by SERVE program design). If at all possible, it is recommended to only make the interest subsidy available for clients that contribute to climate change adaptation (e.g., improved seeds or irrigation).

The following products will have to be developed with assistance of the SERVE project (unless one or more already exist at partner institution level; for example, the first product already exists at Urwego Bank):

1. **A group loan for working capital purposes with seasonal payments.** No collateral is required other than a group guarantee and, if needed, a small percentage of cash collateral. There should be an option to repay loans with mobile money.

2. **An individual working capital loan with seasonal payments.** Agriculture insurance is mandatory, (except for tomato VC). No collateral other than a personal guarantee and biological assets (crops in the field, or chickens) is required. There should be an option to repay loans with mobile money.
3. **An individual loan for irrigation purposes.** Agriculture insurance is mandatory (except for the tomato VC). No collateral other than the financed irrigation equipment, a personal guarantee, biological assets (crops in the field, or chickens) is required. There should be an option to repay loans with mobile money.

Once the loan products have been designed to the satisfaction of the consortium, funding can be released, and the interest rate subsidy can be applied.

At a later phase, value chain finance can be explored for SERVE's priority VCs. However, VC finance requires structured value chains with established supplier-buyer relationships, evidenced by written contracts between suppliers (smallholder farmers) and buyers. The SERVE project could help establish such relationships between suppliers and buyers but this will take significant time and effort to build a VC scheme outside tea or coffee.

### **10.5.2.3. Linkages between informal and formal sectors**

Given the prevalence and popularity of VSLAs and farmers' limited access to formal financial services, CARE international's linkage program between VSLA and formal financial institutions should be scaled up under the SERVE program and made available to all savings groups of farmers under the project that want access to formal sector agriculture loans with Partner Institutions. The VSLA members' savings histories should be well documented and handed over to the Partner Institution so that it could serve as a collateral substitute.

### **10.5.2.4. Advocate and coordinate**

As mentioned, the overall supply of agriculture loans is very low and the consortium should, perhaps jointly with other stakeholders such as Aceli Africa, advocate with the BNR for a target percentage to be lent to farmers by financial institutions, e.g. 10 or 15 percent. Similarly, the consortium could advocate for 'Guidelines on Youth Financial Inclusion', similar to the recently issued 'Guidelines for Women Financial Inclusion'.

Other areas where advocacy can have a positive impact on overall program success is to encourage NAIS to include tomatoes as part of the crops to be insured; and to

advocate with RAB to expand training and extension services to the VCs of the SERVE project.

Given the overlap in project objectives, coordination with the World Bank CDAT program and the various USAID Feed the Future projects could also be beneficial. Finally, coordination with the SSIT program may assist in making irrigation solutions accessible to project beneficiaries.

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**Appendix 1. Major production, collection, distribution and export of French beans in Rwanda**

<b>Company</b>	<b>Address/ Cultivation locations</b>	<b>Scope of the Export Business</b>
NAEB, MINAGRI/RAB	Kigali/ District	Training & Extension services
SAIP project	MINAGRI	Irrigation (hillside and marsh-land) & Vegetable production.
French beans farmers (689) in cooperatives	Nyagatare, Kirehe, Bugesera, Kayanza, Rwamagana, Kicukiro and Gasabo.	Production & collection, Production, collection, fresh handling
GARDEN FRESH	Head Office Kigali, Kicukiro MAGERWA Street / KK 6 AV Gikondo	Production, collection, fresh handling, and export of French beans and Passion fruit
PROXIFRESH RWANDA	Head Office Kigali, Kicukiro MAGERWA Street / KK 6 AV Gikondo	Production, collection, fresh handling and export of French beans
SOUK IG LTD	Head Office Kigali, Kicukiro Niboye, Kicukiro District	Production, collection, fresh handling, and export of Chilli pepper, French beans, Avocado, and Passion fruit
LOTEC RWANDA	Head Office Kamonyi District, Mugomero-Rugalika	Production, French beans, Chilli pepper, Asian vegs
EXODUS FARM LTD	Head Office, Bugesera District	Production, collection, distribution and export of Chilli pepper and French beans
VEGGIE FRESH LTD	Head Office Kigali, Kicukiro Kagarama-Kicukiro	Chilli pepper, french beans
S&I FRESH LTD	Head Office Kigali, Gasabo Nyarugunga	Collection and export of French beans, Chilli pepper, Avocado
ROYAL GROUP COMPANY LTD	Kigali, Gasabo KG 12ST Kimironko	Production, collection, sorting and grading, and export of Chilli pepper, French

Company	Address/ Cultivation locations	Scope of the Export Business
		beans, Passion fruits and Avocado
HIGH AND LUM MULTI SUPPLY IMPORT & EX- PORT LTD	Head Office, Kigali, Gasabo Remera, Street KG 11 AV 42	Collection, handling and export of Chilli pepper, French beans and Avocado

## 13. Annex

### 13.1. Stakeholder consultations

Table 51 contains a list of all the stakeholder consultations conducted as part of this research. The reference number in the first column allows us to track responses more efficiently, and these numbers are used throughout the report to link findings to specific interviews. The first three (or four) letters denote the district.

**Table 51: Stakeholder consultations**

Reference	District	Institution	Person interviewed	Date	Number of interviewees & Gender	Number of youths
Kig_7	Kigali	Pro-femme Twese Hamwe (PFTH)	Emmanuel, Anetta	15.11.2023	2 males	N/A
Kig_8	Kigali	Proxi fresh	Dannissen Chellen (General Manager )	14.11.2023	1 male	None
Kig_9	Kigali	The Ministry of Gender and Family Promotion (MIGEPROF)	Sila Ngayaboshya (Director General)	15.11.2023	1 male	None
Kig_10	Kigali	RYAF	Jean Marie Viani, Jean Bernard Mukundente	28.11.2023	2 males	N/A
Kig_11	Remote	National Union of Disability Organisations in Rwanda (NUDOR)	Jacqueline Turyashemererwa (Admin and finance officer)	20.11.2023	1 female	None
Kig_12	Kigali	RAB - SAIP project	Jean Hittimana	28.11.2023	1 male	None
Kig_13	Kigali	AVIPRO - Poultry production	Pierrick Fertou (Project Coordinator)	28.11.2023	1 male	None

Reference	District	Institution	Person interviewed	Date	Number of interviewees & Gender	Number of youths
Kig_15	Remote	Acre Africa	Dr. Thomas Buzurasanga (Country Manager )	07.11.2023	1 male	None
Kig_16	Remote	Urwego	Solange Uwimana (MFI & and Branch Network Manager)	07.11.2023	1 female	N/A
Kig_17	Kigali	SOPROWOFA - Poultry NGO	Ildephonse (Funder)	27.11.2023	1 male	None
Kig_18	Remote	AMIR	Emmanuel Gumisiriza (Project Coordinator For SERVE)	03.11.2023	1 male	N/A
Gak_1	Gakenke	NEMBA U-SACCO	Jean Bosco Ngaboyimanzi (Manager)	14.11.2023	1 male	None
Gak_2	Gakenke	AMIR	Nahimana Tharisis (Field Coordinator)	14.11.2023	1 male	N/A
Gak_3	Gakenke	BK insurance	Ntirenganya Eugene (Agent)	15.11.2023	1 male	N/A
Gak_4	Gakenke	Rwanda Poultry association	Andrew Butera (Chairman)	15.11.2023	1 male	None
Gak_5	Gakenke	Pineapple retailers/Wholesaler	Ms. Mukantwari (business owner)	15.11.2023	1 female	None
Gak_6	Gakenke	Women group Gashenyi sector	women group	07.11.2023	8 females	5 female youths
Gak_7	Gakenke	COVAFGA Women's group	women group (7 female)(President, Vice-president, Marketing, Auditing, Member)	26.11.2023	7 females	2 female youths
Gak_8	Gakenke	Producer group	women group	07.11.2023	9 females 9 males	8 female youths 8 male youths

Reference	District	Institution	Person interviewed	Date	Number of interviewees & Gender	Number of youths
Gak_9	Gakenke	Green bean producer	Emmanuel Hatungimana	26.11.2023	1 male	N/A
Gak_10	Gakenke	Poultry producer	Nkinamubanzi Faustin	26.11.2023	1 male	N/A
Gak_11	Gakenke	Green bean retailer	Ms. Mukandayisenga Josiane (Business owner)	26.11.2023	1 female	N/A
Gak_12	Gakenke	VSLA	Members of VSLA Group (9 female, 1 male)	25.11.2023	9 females 1 male	9 female youths 1 male youth
Gak_13	Gakenke	District Officials	Ms. Aline Mpambara (Gender Officer), Mr. Nayili Malachie (Youth, sports and culture), Mr. Evariste Kanyetariki (Cash crops officer, Agricultural dept.), Mr. Emmanuel Bizimana (Employment Promotion Officer)	09.11.2023	1 female 3 males	N/A
Huy_1	Huye	Government officials	Government official (Director of agriculture, animal resources and natural resources)	24.11.2023	1 male	N/A
Huy_2	Huye	Umutanguha Finance Company Plc.	Jean de Dieu Ntirenganya (Branch Manager)	04.12.2023	1 male	None
Huy_3	Huye	Producer group chili	Marcel Mbikeshimana	04.12.2023	1 male	N/A
Huy_4	Huye	Farmer group french beans	Agathe Niyonsaba	04.12.2023	1 female	N/A
Huy_5	Huye	Farmer group poultry	Clemence Murekatete	04.12.2023	1 female	N/A
Huy_6	Huye	Women's group EJO HEZA RUBYIRUKO	Women group	04.12.2023	1 female	N/A



Reference	District	Institution	Person interviewed	Date	Number of interviewees & Gender	Number of youths
Huy_7	Huye	Government officials	Government official (Director of agriculture, animal resources and natural resources)	30.11.2023	1 male	N/A
Kay_3	Kayanza	Farmer group tomato	Emmanuel Irankunda, Phenias Uwiringiye	04.12.2023	2 females	N/A
Kay_4	Kayanza	Women group	Esperance Nyiramahoro, Gerardine Mutumwinka, Jane Namurinda	04.12.2023	3 females	N/A
Kay_5	Kayanza	Government officials	Government official (District agronomist)	07.12.2023	1 male	N/A
Kir_8	Kirehe	Farmer group poultry	Innocent Musoni, Obed Ngabonziza, Peace Uwizeyimana, Immaculee Mukanaza, Martine Murorunkere	17.11.2023	3 females 2 males	N/A
Kir_9	Kirehe	Mahama refugee camp (poultry)	16 poultry farmers	17.11.2023	9 females 7 males	N/A
Kir_10	Kirehe	Farmer group french beans	Innocent Musoni, Obed Ngabonziza, Peace Uwizeyimana, Immaculee Mukanaza, Martine Murorunkere	04.12.2023	3 females 2 males	N/A
Kir_11	Kirehe	Farmer group chili	Innocent Musoni, Obed Ngabonziza, Peace Uwizeyimana, Immaculee Mukanaza, Martine Murorunkere	04.12.2023	2 females 3 males	N/A
Kir_12	Kirehe	Farmer group passionfruit	Fidelite Uwishimwe, Daphrose Akimanizanye, Samuel Twirinyimana, Annonciatha Nyirantibimenya, Kabarambe	04.12.2023	2 males 3 females	N/A

Reference	District	Institution	Person interviewed	Date	Number of interviewees & Gender	Number of youths
Kir_13	Kirehe	Farmer group tomato	Fidelite Uwishimwe, Daphrose Akimanizanye, Samuel Twiringiyimana, Annonciatha Nyirantibimenya, Kabarambe	04.12.2023	3 females 2 males	N/A
Kir_14	Kirehe	Financial institution: Twungurane SACCO - Nyamugali	Manager of Twungurane SACCO – Nyamugali	04.12.2023	1 female	N/A
Kir_15	Kirehe	VSLA	Fidelite Uwishimwe, Samuel Twiringiyimana, Annonciatha Nyirantibimenya (Representatives), Kabarambe (Secretary)	04.12.2023	2 females 2 males	N/A
Kir_16	Kirehe	Womens group	Fidelite Uwishimwe, Daphrose Akimanizanye, Annonciatha Nyirantibimenya, Immaculee Mukanaza, Martine Murorunkere, Peace Uwizeyimana	04.12.2023	5 females 1 male	N/A
Kir_17	Kirehe	Government officials	Government official (Director of agriculture, animal resources and natural resources)	07.12.2023	1 male	N/A
Nyam_2	Nyamagabe	Farmer group poultry	Jean Claude Nshimiyimana	05.12.2023	1 male	N/A
Nyam_3	Nyamagabe	Farmer group tomato	Valens Tuyishimire	05.12.2023	1 male	N/A
Nyam_4	Nyamagabe	Financial institution: COOPEC TWIZIGAMIRE	Steven Hakizimana (Branch Manager)	05.12.2023	1 male	N/A
Nyam_5	Nyamagabe	Women group DUHUZU-MUSARURO	Angelique Mukanyandwi, Berthe Niyitanga. Marie Jeanne	05.12.2023	4 females	N/A

Reference	District	Institution	Person interviewed	Date	Number of interviewees & Gender	Number of youths
			Mukakarinda, Solange Ihoza-bose			
Nyam_6	Nyama-gabe	Farmer group passion fruit	Protegene Ntiwiragabo	05.12.2023	1 male	N/A
Nyam_7	Nyama-gabe	Government officials	Government official (District Agronomist)	30.11.2023	1 female	
Rwa_2	Rwama-gana	French bean tomato poultry	12 respondents	08.11.2023	5 females 6 males 1 U/K	N/A
Rwa_3	Rwama-gana	Government officials	Government official (District agronomist)	30.11.2023	1 male	N/A
Rwa_4	Rwama-gana	Farmer group geen beans and tomato	Abatangingama farmer group	07.12.2023	4 females 5 males	N/A
Rwa_5	Rwama-gana	Farmer group poultry	Germaine Tuyiringire	07.12.2023	1 female	N/A
Rwa_6	Rwama-gana	Wholesaler/Processor chili Fisher Global Ltd	Fisher Global Ltd	07.12.2023	1 male	N/A
Rwa_7	Rwama-gana	Processor chili	Donathile Mukandayisenga	07.12.2023	1 female	N/A
Ngo_5	Ngoma	Farmer group chili	Philbert Mwiseneza	05.12.2023	1 male	N/A
Ngo_6	Ngoma	farmer group poultry	Komiza Pacifique	05.12.2023	1 male	N/A
Ngo_7	Ngoma	farmer group tomato	Anathalie Musaniwabo	05.12.2023	1 female	N/A
Ngo_8	Ngoma	farmer group french beans	Eric Bagaragaza	05.12.2023	1 male	N/A

Reference	District	Institution	Person interviewed	Date	Number of interviewees & Gender	Number of youths
Ngo_9	Ngoma	Government officials	Government official (District agronomist)	07.12.2023	1 male	N/A
Nyab_1	Nyabihu	FGD Green beans: TWITEZIMBERE COOP	7 members and president of TWITEZIMBERE COOP	27.11.2023	4 females 4 males	2 female youths 2 male youths
Nyab_2	Nyabihu	Financial Institution SACCO	Solange Mutete (Accountant)	26.11.2023	1 female	N/A
Nyab_3	Nyabihu	District Officials	Monique Uwurukundo Twa-hirwa (Gender Officer), District officer in charge of Youth, sports and culture, Theodore Hatangimbabazi (Cash Crops Officer)	25.11.2023	1 female 1 male 1 N/A	N/A
Nyab_4	Nyabihu	Womens group (tomato) COOP. KOTMUI	8 female members (President, Vice President, Umujiyanama, Members)	27.11.2023	8 females	3 female youths
Nyab_5	Nyabihu	Financial Institutions Urwego Opportunity Bank	Innocent Uwimana (Branch Manager), Jean Paul Umuhire (Loan officer)	27.11.2023	2 males	2 male youths
Rub_3	Rubavu	Cabbage producer individual	Veronique Nyiransangiranabo	22.11.2023	1 female	None
Rub_4	Rubavu	Carrot aggregator and retailer	Norbert Shyirambere (Aggregator), Jeannette Uwamahoro (Retailer)	22.11.2023	1 female 1 male	None
Rub_5	Rubavu	Carrot producer KOTI-BANYA Cooperative	9 members (5 female, 4 male)(President, Vice President,	22.11.2023	4 males 5 females	4 female youths

Reference	District	Institution	Person interviewed	Date	Number of interviewees & Gender	Number of youths
			Umunyamuryango, Accountant)			
Rub_6	Rubavu	Poultry Producers (ABA-HUJUBUMWE GROUP)	7 members (1 female, 6 male)(President, Vice President, Umunyamuryango, Accountant, Member)	22.11.2023	1 female 7 males	1 female youth 7 male youths
Rub_7	Rubavu	Insurance provider Radiant	Modeste Musabimana (Field Officer)	23.11.2023	1 male	None
Rub_8	Rubavu	District Officials	Albert Sibomana (Employment promotion officer), Deo Ngoga Kalisa (Youth coordinator), Lucie Uwamahoro (Gender Officer)	23.11.2023	1 female 2 males	2 male youths
Rub_9	Rubavu	Tomato Producers (Nyamyumba youth in agri-business)	7 members (2 female, 5 male), 1 president (female)	28.11.2023	3 females 5 males	3 female youths 5 male youths
Rub_10	Rubavu	Women's group tomato producers	7 members (2 female, 5 male), 1 president (female)	28.11.2023	3 females 5 males	3 female youths 5 male youths
Rul_1	Rulindo	FGD women VSLA (Tuzamurane Remera)	Women group	13.11.2023	17 females 1 male	12 youth females
Rul_2	Rulindo	Processor tomato chilli passionfruit (Enterprise Urwibutso)	Sina Gerard	13.11.2023	1 male	None

Reference	District	Institution	Person interviewed	Date	Number of interviewees & Gender	Number of youths
Rul_3	Rulindo	Retailer chilli tomato green beans	Retailer	13.11.2023	1 female	N/A
Rul_4	Rulindo	Farmer group cabbage green beans	farmer group	16.11.2023	1 male 2 females	1 youth male 2 youth females
Rul_5	Rulindo	Farmer group poultry carrot tomato	farmer group	16.11.2023	2 females 1 male	2 female youths 1 male youth
Rul_6	Rulindo	FGD tomato Duterimbere Group	DUTERIMBERE Youth Group members	16.11.2023	5 females 5 males	5 female youths 5 male youths
Rul_7	Rulindo	Financial service providers Umutanguha finance	Catheline Mujawayezu (Credit Officer)	17.11.2023	1 female	None
Rul_8	Rulindo	District officials	Emmanuel Ndayambaje (Cash Crop Officer)	17.11.2023	1 male	None
Rul_9	Rulindo	Chilli wholesaler processor	Wholesaler	08.11.2023	XX	
Rul_10	Rulindo	Chilli Farmer group/producers	farmer group	08.11.2023	XX	
Rul_12	Rulindo	FGC Chilli Terimbere muhinzi	farmer group	10.11.2023	8 females 5 males	8 female youths 4 male youths
Rul_13	Rulindo	Wholesaler tomato	Wholesaler	10.11.2023	XX	

Reference	District	Institution	Person interviewed	Date	Number of interviewees & Gender	Number of youths
RuL_14	Rulindo	Wholesaler Chilli	Wholesaler	08.11.2023	XX	

## 13.2. Survey Instruments

For the value chain surveys there are 4 basic types of stakeholders:

- Male and female producers: Farmer Groups and Farmer Promoters networks (incl. Female and youth networks); commercial farms
- Other project affected parties and interest groups (e.g. women and youth groups at village level, refugee camps and groups, people with disabilities, community groups)
- Male and female value chain actors<sup>227</sup>
- Government officials (NAEB, RAB, MINAGRI, District officials)

The value chain survey covered four priority value chains of tomato, chilli, green beans, and poultry as well as some potential value chains including passionfruit, cabbage, carrot.

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<sup>227</sup> Including processors, producer associations, wholesalers, retailers, exporters, consumers, input suppliers, service providers, etc.



## Farmer groups/Producers

Interviewer name (s): \_\_\_\_\_

Name of the interviewed organization: \_\_\_\_\_

Type of the interviewed organization (Bank, leasing co. MFI):  
\_\_\_\_\_

### Names and positions, experience w/ organization of the interviewees:

Name (indicate Mr./ Ms.)	Position	Yrs with firm
_____	_____	_____
_____	_____	_____
_____	_____	_____

(if physical meeting: request business card)

Date: \_\_\_\_\_ Location: \_\_\_\_\_

### Commodity basics:

1. For this commodity, please describe the main steps in production, processing and final markets. Identify main actors and farmer activities.
  - o What is required in terms of inputs, labor, transport, value adding, and delivery/distribution
  - o Is this a profitable commodity for you? Why/Why not?
2. Is the land in your district very suitable for this commodity? Why do you choose to produce this commodity here as opposed to other products?
3. What is the role of women in this commodity? (Probe for participation and impact, proportion, role, and decision making of female/youth in production/value chain);
4. Which activities do you think are the best suited for female youth and why?

### Challenges, threats, and bottlenecks

5. What are the biggest challenges with this commodity? Please describe the challenges in detail and explain why this causes the most problems (list of potential examples below)
  - o Barriers to entry?
  - o Availability of inputs?
  - o Capacity constraints (technical knowledge/equipment etc.)
  - o Access to finance,
  - o Access to market information?
  - o Access to climate information (through efficient climate information services)?
  - o Quality control /certification
  - o Post harvest loss
  - o Access to market and market facilities (infrastructure)
  - o Production risks like disease? Regulatory problems?
  - o Plot size?

- Natural hazards
- Land tenure issues
- Any other issues?
- 

### **Risk and environmental analysis**

6. What are the main environmental risks for this commodity and how do you manage these risks?
  - Landslides (terracing? Other erosion measures?)
  - Floods
  - Drought (irrigation and dam sheets)
  - Pest and disease (IPM, biopesticides?)
  - Wildfire
  - Other
7. What have been the most effective risk mitigation measures? E.g. irrigation, terraces, pest management, etc. What if any issues exist when scaling up these measures?
  - How much do these measures cost to build?
  - Do these measures make you more resilient to climate change?

### **Market structure issues**

8. For this commodity, do you see any market structural issues or advantages across the following topics?
  - Number of Firms
  - Barriers to Entry
  - Product Differentiation
  - Pricing Power
  - Market Share
  - Market Concentration
  - Regulation
  - Innovation and Competition
  - Market Performance

### **Opportunities**

9. What do you see as the biggest opportunities or areas with potential in the different production stages for this commodity – in particular for female youth? For examples or ideas please see the list below:
  - Marketing
  - Pest management
  - Quality Certification
  - Export Diversification
  - Technology Adoption
  - Supply Chain Integration

- Sustainable Practices<sup>228</sup>
  - Product Differentiation
  - Post-Harvest Handling
10. Are there any existing initiatives for female youth that you can tell us about?

#### **Needs/requirements to improve and skills gaps**

11. What are the major skills gaps for this commodity? Do you see any particular skills gaps for females and youth workers?
- What do you need to be able to reach the opportunities described above?
  - Who can provide this?
  - Please describe any issues with the current services (extension workers, demonstration plots, etc.)
  - If applicable: How difficult is it to qualify for certification? What benefits would this lead to and what difficulties do you see in reaching this level of production?

#### **Standards and compliance**

12. What is the role of Quality Standards (FCS, Global GAP, SMETA) in this commodity
- Please comment on compliance to standards in the market generally: do people comply with the standards, if not, why not?

#### **Policy gaps for female workers**

13. Are there any policy gaps that impact female practitioners across the production and marketing stages of this commodity?

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<sup>228</sup> Sustainable practices are environmentally and socially responsible actions that aim to conserve resources and protect the well-being of future generations, e.g. recycling or zero tillage farming

## Women's groups

Interviewer name (s): \_\_\_\_\_

Name of the interviewed organization: \_\_\_\_\_

Type of the interviewed organization (Bank, leasing co. MFI):  
\_\_\_\_\_

### Names and positions, experience w/ organization of the interviewees:

Name (indicate Mr./ Ms.)

Position

Yrs with firm

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(if physical meeting: request business card)

Date: \_\_\_\_\_ Location: \_\_\_\_\_

1. Which commodities are mostly in the responsibility of women? Which commodities are mostly in the responsibility of men? How is youth, especially young women, involved in the commodity? Please name a few examples.
2. If a commodity is in the responsibility of women, are they responsible for the whole production chain, from production over processing and transport, to marketing and selling?
3. What are the reasons in your opinion? Why do women work on specific commodities, and men in others? Why are some shared? (Probe for access to equipment and production assets, investment costs, availability of finance, tech skill requirements, social norms, time availability)
4. Do farmers receive support for the development of commodities? Probe for their involvement in training, quality control, input supply, and marketing etc.
5. What is the role of women in agricultural production and processing?
6. What could be done to make production more efficient or easier? How could you save time? (Probe for scale of production, investment in equipment, capacity development, extension services, better work organization in cooperative, climate information on forecasts for better planning)
7. What are specific entry barriers for women in this commodity? (Probe for access to equipment and production assets, investment costs, availability of finance, tech skill requirements, social norms, time availability, land tenure)
8. What are specific entry barriers for youth and specifically for young female farmers in these commodities? (Probe for access to equipment and production assets, investment costs, availability of finance, tech skill requirements, social norms, time availability, land tenure)
9. Would you be interested to organize yourself in a production cooperative focusing on empowering women? Which advantages would you see?

10. For you, what are the main challenges to participate in farmer activities, trainings or commodities development activities? Does youth face different or more challenges? (Probe for mobility concerns, difficulties to reach the training/meeting location, inadequate training/meeting facilities for women, time availability, financial constraints, social expectations concerning what women should do, financial restrictions, etc.)
11. Which conditions or support would you need to participate in those activities? What support would youth and specifically young women need? (Probe for child care, adequate meeting/training facilities for men and women (e.g. sanitation), women trainers or leaders, training at farm gate)

## Processors/Wholesalers/Retailers

Interviewer name (s): \_\_\_\_\_

Name of the interviewed organization: \_\_\_\_\_

Type of the interviewed organization:

### Names and positions, experience w/ organization of the interviewees:

Name (indicate Mr./ Ms.)	Position	Yrs with firm
_____	_____	_____
_____	_____	_____
_____	_____	_____

(if physical meeting: request business card)

Date: \_\_\_\_\_ Location: \_\_\_\_\_

1. Please describe your operations in this value chain
  - a. Processing
  - b. Packaging
  - c. Quality assessment
  - d. Cold storage?
2. Are many women working in your sector or firm? Which tasks do women usually take over within your sector or firm?
3. Do you employ youth (age up to 35 years) and especially young women? What percentage of your workforce are youth or women? Which tasks do they usually take over?
4. What are specific entry barriers in your sector for women or youth?
5. Can you give your thoughts on Rwanda's market potential and competitiveness internationally?
6. Where do you see potential for new markets at local, national, regional, and international level?
7. What role do standards play in this value chain? Are they aware of standards, what are the requirements, what are the relevant applicable standards and how would they impact profits?
8. Does your organization/institution or department have adequate staffing/financing/knowledge capacity to invest in some of the value chains? (Yes, Maybe, No)-Explain

### Challenges, threats and bottlenecks

9. What are the biggest challenges for female youth employment within this value chain?
  - o Barriers to entry?
  - o Availability of inputs?

- Capacity constraints (technical knowledge/equipment etc.)
- Access to finance
- Access to market information?
- Quality control
- Post harvest loss
- Access to market and market facilities (infrastructure)
- Production risks like disease? Regulatory problems?
- Plot size?
- Natural hazards
- Land tenure issues
- #any other issues?

### **Strengths or Opportunities to add value**

10. Where do you see the biggest potential for this commodity in the next five years?
11. Do you see any advantages in developing this value chain compared to other others?
12. How can producers/markets add value and develop future opportunities?
  - Improve production
  - Value addition/ processing,
  - Market level/exports (national or international)
  - Quality Standards (FCS, Global GAP, SMETA) in this value chain
13. If you had to recommend one concrete opportunity for women along this value chain what would it be? (Probe for a concrete idea; e.g. processing, marketing, selling)

### **Needs/requirements to improve**

14. What do you need to be able to reach the opportunities described above?
15. Who can provide this?
16. If applicable: How difficult is it to qualify for certification? What benefits would this lead to and what difficulties do you see in reaching this level of production?

## For end buyers specifically: High end hotels or Restaurants

Interviewer name (s): \_\_\_\_\_

Name of the interviewed organization: \_\_\_\_\_

Type of the interviewed organization: \_\_\_\_\_

### Names and positions, experience w/ organization of the interviewees:

Name (indicate Mr./ Ms.)	Position	Yrs with firm
_____	_____	_____
_____	_____	_____
_____	_____	_____

(if physical meeting: request business card)

Date: \_\_\_\_\_ Location: \_\_\_\_\_

### Sourcing Practices:

1. How do you currently source (commodity x) for your high-end hotel?
2. Are there any specific criteria or standards you follow when selecting suppliers?
3. What are the current employment opportunities and job roles within these processes, and what percentage of them are occupied by females?
4. Have you actively sought to employ women in various positions within your procurement and supply chain, including roles related to sourcing, quality control, logistics, or other functions?
5. What strategies or efforts have you made to encourage and support female employment in these roles?

### Supplier Relationships:

6. Do you have preferred suppliers for (commodity x), and if so, what qualities do you value in these suppliers?
7. Have you had any experience working with local or female-owned suppliers for your produce needs?
8. Have you considered sourcing (commodity x) from local female-led cooperatives or suppliers? If so, how has this affected employment opportunities for women in your supply chain?
9. What experiences or outcomes have you observed when working with female-led suppliers in terms of job creation for women in Rwanda?

### Quality and Freshness and certification/standards

10. What quality standards do you expect from the (commodity x) you purchase for your hotel?



11. How important is the freshness of the produce to your menu and customer satisfaction?
12. Do you prioritize sustainability or specific certifications (e.g., organic, fair trade) when sourcing (commodity x)?
13. Are there any initiatives or labels that you look for to ensure ethical and sustainable sourcing?

**Pricing and Cost Considerations:**

14. How do price and cost considerations factor into your procurement decisions for (commodity x)?
15. Are you willing to pay a premium for higher quality or locally sourced produce?

**Potential for Female Participation:**

16. Have you considered or explored opportunities to source (commodity x) from female farmers or cooperatives?
17. What factors would influence your decision to support female-led or women-inclusive supply chains?

**Supply Chain Challenges:**

18. What challenges, if any, do you encounter in sourcing (commodity x) for your high-end hotel?
19. Are there any specific challenges related to quality, consistency, or availability?

**Future Goals:**

20. Are there any plans to further integrate local or female-led suppliers into your procurement strategy?
21. How do you envision the future of your supply chain, particularly in terms of sustainability and inclusivity?

**Feedback and Suggestions:**

22. Do you have any feedback or suggestions for improving the sourcing of (commodity x) or other agricultural products in Rwanda, especially with a focus on gender inclusivity?

## Government officials (NAEB, RAB, MINAGRI, DISTRICT)

Interviewer name (s): \_\_\_\_\_

Name of the interviewed organization: \_\_\_\_\_

Type of the interviewed organization (Bank, leasing co. MFI): \_\_\_\_\_

### Names and positions, experience w/ organization of the interviewees:

Name (indicate Mr./ Ms.)	Position	Yrs with firm
_____	_____	_____
_____	_____	_____
_____	_____	_____

(if physical meeting: request business card)

Date: \_\_\_\_\_ Location: \_\_\_\_\_

1. What programs exist to support value chain development and promotion
2. Where do you see the biggest challenges to developing value chain x
3. What are the biggest opportunities for value chain x
4. What is the government doing to better support farmers, processors, retailers?
5. What is the government doing to support women in the sector?
6. What does your ministry/department do to support youth, women and gender equality within the agricultural sector?
7. What is the role of women and youth in agricultural production and processing?
8. What are challenges that women and youth face in rural areas and the agricultural sector?
9. What are specific entry barriers for women in commercial agricultural production? (*Probe for access to equipment and production assets, investment costs, availability of finance, tech skill requirements, social norms, time availability, land tenure*)
10. What are specific entry barriers for youth and specifically for young female farmers commercial agricultural production?
11. Has government staff been trained on gender issues? If yes, what were the addressed topics?
12. How do you rate the level of understanding and awareness of different value chain actors regarding gender issues? (5-Excellent, 4-Very good, 3-Neutral, 2-Fair, 1-Poor).
13. Does your organization/institution or department have adequate staffing/financing/knowledge capacity to support some of the value chains? (Yes, Maybe, No)-Explain
14. In your own assessment, do the government and non-government institutional partners, engaged in supporting value chains have the adequate skills required for supporting female youth in the implementation of the value chain programs/activities? Yes/No (Explain and provide any specific examples in terms of extension services, financial services, or climate change mitigation?)
15. What do you see as the market potential for x value chain and what are the most important trends? E.g. Rwanda's competitiveness, market size, market growth, price competitiveness etc.

## Agri financing related questions for focus group discussions with farmers and women's/youth groups.

Interviewer name (s): \_\_\_\_\_

Name of the interviewed organization: \_\_\_\_\_

Type of the interviewed organization (Bank, leasing co. MFI):

\_\_\_\_\_

### Names and positions, experience w/ organization of the interviewees:

Name (indicate Mr./ Ms.)	Position	Yrs with firm
_____	_____	_____
_____	_____	_____
_____	_____	_____

(if physical meeting: request business card)

Date: \_\_\_\_\_ Location: \_\_\_\_\_

### Access to finance

1. Could you describe your experience with banking services, including which banks you use and the convenience of accessing them?
2. Tell us about your use of mobile money services, including your experiences with finding the nearest agent and any challenges you face regarding accessibility.
3. Could you tell us if you are a member of a u-SACCO, including which u-SACCO and the convenience of accessing it?
4. Could you tell us if you are a member of an informal savings group (such as a VSLA or Tontine)? What has been your experience so far?
5. Can you tell us if you have a loan now, from what source (e.g., a bank, an u-SACCO, friends and family) and what the purpose is? Is it for agriculture or something else? Also, can you describe the terms and conditions of your loan?
6. Can you tell us if you had a loan in the past 2 years that is repaid, from what source (e.g., a bank, a u-SACCO, friends and family) and what the purpose was? Was it for agriculture or something else? Also, can you describe the terms and conditions of your past loan?
7. Can you let us know if your loan is (or was) loan guaranteed with a guarantee facility, including by whom?
8. Could you please describe what barriers or bottlenecks you experience in getting a loan, for instance when it comes to documentation requirements or collateral?

### Other services (policy entitlements)

9. Could you describe your experience with receiving agriculture extension services, including from what source (e.g., Twigire Muhinzi or CAES), and how satisfied you are with these services?
10. Please tell us if you recently participated in a farmer field school or other training program and what your experience was.

11. Could you describe your experience with agriculture insurance, including how it was priced (was it subsidized as part of Tekana Urishingiwe Muhinzi Mworoz), if you ever filed an insurance claim, and how satisfied you are with your insurance?
12. Could you let us know if you signed up to the Smart Nkunganire (SNS) platform and what your experience has been so far?
13. Please share with us if you have received any input subsidies under the Agriculture Subsidies Program, or a subsidy for irrigation under the Small Scale Irrigation Technology (SSIT) subsidy program, or benefited from the Girinka program.
14. Please tell us if you receive any **other government or donor support** related to agriculture and if so, what type?
15. Could you describe the **barriers or bottlenecks** that you experience in accessing government or donor support programs?

## Interview Guide for Financial Institutions and AMIR

(see separate Interview Guide for insurance providers below)

Interviewer name (s): \_\_\_\_\_

Name of the interviewed organization: \_\_\_\_\_

Type of the interviewed organization (Bank, leasing co. MFI):  
\_\_\_\_\_

### Names and positions, experience w/ organization of the interviewees:

Name (indicate Mr./ Ms.)	Position	Yrs with firm
_____	_____	_____
_____	_____	_____
_____	_____	_____

(if physical meeting: request business card)

Date: \_\_\_\_\_

Location: \_\_\_\_\_

### Target interviewees:

- Agri dept. Manager and/ or Head of Business and/ or Credit Manager
- AMIR: CEO/ General Secretary (use this guide to ask generic questions about MFI sector)

### Objectives:

- Priority: Understand bank's/ FI's **engagement** in agri finance, including lending to women and youth
- Understand **products** for agriculture, in particular for women and youth
- Understand **district** coverage/ involvement in **VCs**
- Understand **barriers in lending** to agri finance, especially in lending to women and youth.

**INSTRUCTION: to the extent possible, please collect and complete information under section A prior to the interview from the website, annual report and secondary sources General information on current operation**

### 1. Background on your institution

- a. Years of operation
- b. percent of loan book that is agriculture
- c.
- d. Portfolio quality ( percentNPL, trend); root cause of delinquency?
- e. Key **client segments** served (e.g. **Women, Youth**, Corporate, SME, Retail/ salary earners, Micro Entrepreneurs, (SH) Farmers),
- f. Main **channels** (e.g. branch network (# of branches), Mobile Money, Agent Banking etc.)
- g. Main **products/ services** offered (e.g. current a/c, savings a/c, transfers, loans)
- h. Geographical coverage / which districts

### A. Information on agricultural finance

2. Are you a member of the Association on Microfinance institutions in Rwanda (AMIR)? Have you ever been approached by AMIR, if so was the topic of lending to women and youth raised, and if so what were the outcomes?
3. Is the agri portfolio increasing, decreasing or steady? Why? What is the strategy?
4. Which value chains are you active in? Why?
5. In which districts are you providing agriculture finance?
6. Do you lend to new businesses (i.e., businesses/ farms without prior experience)
7. How is agricultural finance organized in your FI?
  - a. Specialized department at HQ? # dedicated HQ staff? # dedicated branch staff?
  - b. Loan officers with agricultural background/ training?
  - c. Loan approvals centralized or decentralized?
8. What agricultural products do you offer?
  - a. Value Chain finance: If yes, which VCs? Who are main partners? Districts? etc.
  - b. Funding outgrower scheme: If yes, which VCs? Who are main partners? Districts? etc.
  - c. Cash-flow based finance
  - d. Asset-based finance
  - e. Group loans
  - f. Other:
9. Do you have special products for women and youth? Do you have special agri products for women and youth?
10. Can you describe the loan process for agri loans - from origination to disbursement for Small-holder loans?
  - a. Repeat question: asset based vs. cashflow based approach
  - b. Origination, approval
  - c. Documentation requirements
  - d. What is the average processing time of an agri loan? TTY/ TTC<sup>229</sup>? What causes the delay?
  - e. How many agri loans were disbursed last week/ month?
11. How are agri loans collateralized:
  - a. Loan to Value:
  - b. Land title/ customary land/ movables/ stock/
  - c. Use of warehouse receipts as collateral
12. How many agricultural clients & volumes (by sub-segment)?
  - a. SH farmers
    - i. Women
    - ii. Youth
  - b. Commercial farmers
  - c. Processors/ aggregators etc.
  - d. Input suppliers
  - e. Other:
13. What are the challenges that you face in expanding your portfolio/ operation in providing agriculture finance?
14. Are there any policy related challenges? How should policies improve to increase agriculture lending?

**B. Experience working with smallholders / women/ youth**

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<sup>229</sup> Time to Yes and Time to Close - Time to Yes (TTY); TTY represents the time it takes for a financial institution to make a decision and approve the agricultural loan after receiving the application. Time to Close (TTC); TTC encompasses the entire processing period from the loan application submission to the final disbursement of funds.

15. What barriers/ challenges did you experience in lending to smallholders?
16. Where do you see opportunity in working with smallholders?
17. Are barriers to and opportunities for working with female and youth smallholders different?  
Please explain how.
18. Are there any policy specific challenges related to lending to smallholders/ women/ youth?
19. Existing cooperation: do you receive any credit lines/ guarantees/ Technical Assistance from Development Finance Institutions, donors, government etc.
  - a. Purpose, target group
  - b. Terms and conditions

**C. Existing and future cooperation**

20. Do you have prior experience with donor projects in relation to agriculture? What has worked, what hasn't?
21. What would be needed to start/ increase lending to women and youth in agriculture?
  - a. Funding (maturity, indicative pricing, currency)
  - b. De-risking
    - i. Guarantees
    - ii. Availability of agri insurance
  - c. Technical assistance (training, establishing agri dept, product development etc.)
  - d. Establishing partnerships with buyers/ processors
  - e. Other

## Interview Guide for Insurance Providers

Interviewer name (s): \_\_\_\_\_

Name of the interviewed organization: \_\_\_\_\_

Type of the interviewed organization (Insurance provider, branch of insurance provider, government official, other). Note that the NAIS is implemented by SONARWA, PRIME and Radiant.

\_\_\_\_\_

### Names and positions, experience w/ organization of the interviewees:

Name (indicate Mr./ Ms.)	Position	Yrs with firm
_____	_____	_____
_____	_____	_____
_____	_____	_____

(if physical meeting: request business card)

Date: \_\_\_\_\_ Location: \_\_\_\_\_

### Target interviewees:

- CEO, COO, or Head of Agri of insurance company
- Senior government official/ ministry of agriculture in charge of NAIS

### Objectives:

- Priority: Understand the insurance company's **engagement** in agri insurance, including providing insurance to women and youth
- Understand insurance **products** for agriculture, in particular for women and youth
- Understand **district** coverage/ involvement in **VCs**
- Understand **barriers** in offering agri insurance, especially in lending to women and youth.

Interviewer name (s): \_\_\_\_\_

Name of the interviewed organization: \_\_\_\_\_

Type of the interviewed organization :

\_\_\_\_\_

### Names and positions, experience w/ organization of the interviewees:

Name (indicate Mr./ Ms.)	Position	Yrs with firm
_____	_____	_____
_____	_____	_____
_____	_____	_____

(if physical meeting: request business card)

Date: \_\_\_\_\_ Location: \_\_\_\_\_

**INSTRUCTION: to the extent possible, please collect and complete information under section A prior to the interview from the website, annual report and secondary sources General information on current operation**

### 1. Background on your institution

- a. Years of operation



- b. Number of agri insurance policies under NAIS
- c. Number of other agri insurance policies (not covered by NAIS)
- d. Total number of insurance policies
- e. Key **client segments** served (e.g. **Women, Youth**, Corporate, SME, Retail/ salary earners, Micro Entrepreneurs, (SH) Farmers),
- f. Main **channels** (e.g. branch network (# of branches), Mobile Money, Agent Banking etc.)
- g. Geographical coverage / which districts

**D. Information on agricultural insurance**

2. **Is agri insurance increasing, decreasing or steady? Why? What is the strategy?**
3. **Which value chains / commodities are covered**
4. **In which districts are you providing agriculture insurance?**
5. **What agricultural insurance products do you offer?**
  - a. Weather index insurance
  - b. Yield index insurance
  - c. Multi peril crop insurance
  - d. Soil moisture index insurance
  - e. Others, namely.....
6. **Do you have special insurance products for women and youth? Do you have special agri insurance products for women and youth?**
7. **Can you describe the process for issuing agri insurance policies - from origination to claims handling?**
8. **How many agricultural insurance clients?**
  - a. SH farmers
    - i. Women
    - ii. Youth
  - b. Commercial farmers
  - c. Processors/ aggregators etc.
  - d. Input suppliers
  - e. Other:
9. **What are the challenges that you face in expanding your operation?**
10. **Are there any policy related challenges? How should policies improve to increase agriculture insurance?**

**E. Experience working with smallholders / women/ youth**

11. **What barriers/ challenges did you experience in providing insurance to smallholders?**
12. **Where do you see opportunity in working with smallholders?**
13. **Are barriers to and opportunities for working with female and youth smallholders different? Please explain how.**
14. **Are there any policy specific challenges related to lending to smallholders/ women/ youth?**

**F. Existing and future cooperation**

15. **Do you have prior experience with donor projects in relation to agriculture insurance? What has worked, what hasn't?**
16. **What would be needed to start/ increase insurance to women and youth in agriculture?**
  - a. Funding (maturity, indicative pricing, currency)
  - b. Cost sharing
  - c. Technical assistance (training, establishing agri dept, product development etc.)
  - d. Establishing partnerships with buyers/ processors

e. Other



