Climate Resilience Through Microfinance: Insights from Rwanda

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EXECUTIVE SUMMARY

Research Topic
Smallholder farmers are highly sensitive to climate change impacts and often have limited means of recovering from or adapting to these. In Rwanda, microfinance products directed at farmers, available through farming or financial cooperatives, have mainly comprised of loans of seed and fertiliser, aimed at increasing yield but not specifically at increasing climate resilience. This project investigated farmers’ experiences with climate change and mitigation; vulnerabilities and exclusions; reverberations of rural climate change impacts in the urban areas of Kigali; opportunities for microfinance institutions (MFIs) to support climate adaptation beyond current products, and possibilities for widening access to climate-resilient solutions through financial inclusion for lower income and more vulnerable groups.

Methods
Interviews (n=30), surveys (n=270), participatory mapping (n=3) and transect walks (n=3) were conducted with smallholder farmers (n=30) in three rural districts of Rwanda: Gisagara, Musanze and Ngoma. Participants were selected through initial contacts identified by Urwego Bank, the local MFI partner of Opportunity International, who funded this research project. Additional interviews were held with agricultural loans officers. Furthermore, 10 interviews were conducted with traders in agricultural produce in Kigali district. Finally, e-interviews (n=11) were held with stakeholders working in the field of financial inclusion, agriculture, development and climate change in Rwanda, to consider the way forward for microfinance as a tool for climate adaptation.

The three rural districts comprise a range of climate vulnerabilities, in terms of the population’s income and age, infrastructure, agricultural sensitivity, and weather patterns.

Climate Impacts and Mitigation
In Musanze, situated in a mountainous region in the North, heavy rain, hail and flooding were experienced almost universally, which affected the potato crop, important for both income and food security. In Gisagara and Ngoma, where rice and maize are important crops, both drought and floods were commonly reported. A majority believed that weather changes are an increasing problem. Direct impacts included erosion, damage to irrigation infrastructure, lost harvests; increased pests and diseases; and damage to property; whereas indirect impacts included malnutrition and famine (including not being able to feed children); ‘suffering’; increased mosquitoes; and a lack of money for school fees, building or home improvement projects, paying back loans, and hiring or paying workers.

 Farmers reported that water infrastructure had helped address both flooding and drought, but were not enough and could not always prevent heavy floods. Erosion was mitigated by digging contours and planting trees or grasses. This was generally perceived to be effective, although trees take time to grow. Planting early was thought important to mitigate losses and some farmers had changed crops or crop varieties. Farmers mentioned ‘modern agriculture’ and saw pesticides and fertilisers as helpful in fighting climate change, but also acknowledged that the additional investment posed a financial risk if crops still failed.

There were indications that both climate impacts and access to opportunities for adaptation and mitigation were unequally distributed, both within cooperatives and when considering those outside of cooperatives.

Financial mitigation and experiences with loans
Financial mitigation measures included spending savings, engaging in casual labour, selling assets, and borrowing money. Few farmers who had suffered financial losses as a consequence of climate or environmental change had fully recovered. Income diversification, e.g. owning a motorbike or livestock, was perceived to help farmers cope. Insurance was seen as important, but levels of understanding and trust were variable.

Generally, respondents thought loans had a positive effect on their ability to deal with climate impacts. Urwego Bank (UB) had shown flexibility when climate impacts had affected repayment ability; a new loan would not be issued until the first one was repaid to avoid spiralling debt. Loans enhanced educational prospects of farmers and their families and helped cover health insurance and the purchase of phones, but moreover provided enough financial stability to plan ahead. Loans also allowed farmers to continue paying workers and avoided the need to spend savings. Having control over loans appeared to be of crucial importance, especially when needing to respond fast to climate impacts.

A common point of dissatisfaction with loans was late disbursement, which prevented farmers from planting early. This could affect poorer farmers most. Also mentioned were high interest rates and penalties, the latter sometimes for circumstances outside of the farmers’ control, such as climate impacts. Some also referred to short repayment periods.

Loan repayment was mainly hindered by weather problems, but short repayment periods and high interest were mentioned again. Cooperatives supported their members by providing a financial buffer when the harvest was poor. Occasionally, though, defaulting could lead to conflict within or temporary suspension from the cooperative, having to work off debts, being pressured to sell assets, or leaving farming altogether; whilst social impacts included loss of trust, stigma, humiliation, anxiety and stress, family disputes, and malnutrition.

Barriers to taking out loans
The cooperative acts as a conduit and guarantor for the loan and internally assesses the member’s ability to repay before approving it. A lack of collateral was the most important barrier for members taking out loans, but cooperatives could also be reluctant to include some members in group
had caused significant losses for almost ¾ of respondents and most had had to change supplier due to bad weather, experiencing reduced availability, inferior quality and higher prices. In the urban setting, participants rarely related climate experiences directly with issues around loans. A lack of knowledge about loan conditions was a key challenge in paying back microfinance loans, although a lack of demand due to Covid-19 and defaulting customers were also mentioned. The main suggested change was a longer repayment period. Whilst there was an awareness of financial risk, many people had positive experiences with loans, which helped them grow their business and improve their standard of living.

The way forward
Microfinance could provide a solution for the challenge of ensuring that investments at the national level reach smallholder farmers, although a number of stakeholders confirmed that current product designs, with high interest rates and short repayment schedules, were unaffordable for many subsistence smallholder farmers, in particular for securing climate-resilient infrastructure such as water tanks and pumps, which also typically requires larger loan sizes than MFIs provide. MF is not reaching the most vulnerable, with the risk of increasing stratification in climate vulnerability if these limitations are not addressed.

Suggestions for loan products and processes and non-financial services
Smallholders expressed interest in loans for pesticides; larger machinery and collective storage facilities; livestock and poultry; measures and equipment for water management and erosion control; and non-agricultural activities such as construction, business, transport, and general expenses. Loans would also be useful to hire more labour to plough and plant early. For larger expenditure, communal loans and longer repayment periods were suggested.

Suggestions on process improvements related mainly to timely disbursement of the loans and longer loan periods. Importantly, it was suggested that loan extensions, lower interest rates, emergency funds, and repayment in the next season would help mitigate climate impacts. Flexibility was seen as important as penalties could lead to a spiral of debt. To broaden access, comprehensive training and pre-loan advice was seen as important. Solutions to the high barrier posed by the collateral requirement would also be needed, such as government provision of a guarantee or joint liability in the cooperative for those who cannot provide it.

Most farmers did not feel they had sufficient knowledge to deal with erratic weather expressed an interest in technical training; provisioning or infrastructural support; agronomists would be welcome. Participants felt the government should play a role in providing information and technical training; provisioning or infrastructural support; and financial support, advocacy and price regulation. Quite a few successful partnerships were mentioned, e.g. with non-governmental organisations (NGOs), governments, and MFIs.

Urban food security and loans in the urban setting
Food vendors in Kigali almost universally thought climate impacts were worse now than in the past. Heat and rainfall increased climate resilience. MFIs were seen as well-positioned to develop and deliver such services.

Microfinance, as currently offered in Rwanda, is neither designed to support the very poorest in society, nor to offer the size and types of loans that would allow for investment in climate resilient infrastructure, such as irrigation equipment. Any adaption strategy that proposes an important role for loans therefore risks increasing equality. The recommendations included in this report aim towards a reduction of both climate risks and financial risk more generally, but also to contribute to removing barriers and improving access to finance, which, it is hoped, will mitigate this undesirable societal effect. Nevertheless, the report identified that some farmers and vendors are reluctant to enter into debt, sometimes with very good reason. Therefore, microfinance loans should always be part of a much wider package of support measures that addresses vulnerability to climate change, and, whilst we have sought to explore how microfinance can increase access to adaptation measures to climate change, longer term monitoring will be required to gauge the impact on social and community structures.
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1. INTRODUCTION

1.1. Background

Least Developed Countries (LDCs) are some of the most vulnerable to climate change, in part due to the fact that their economic growth is highly dependent on climate-sensitive sectors (UNDP, 2010). This is indeed the case for Rwanda, which is highly reliant on rain-fed agriculture and agricultural livelihoods (Republic of Rwanda, 2020). International climate finance has typically focused on delivery at national rather than individual/household level recipients, with one study suggesting that as little as 10% of climate or development finance reaches the local level (Soanes et al. 2017).

Microfinance institutions (MFIs) play an important role in directing development finance to individuals and households, but historically have not focused on improving climate resilience. Our recent research project ‘Microfinance and Climate Change in Rwanda’ (Helwig et al. 2020), which focused on Rwandan farmers, found that micro-loans provided by Urwego Bank had enabled some farmers to mitigate some of the climate impacts they had experienced. Training provided by Urwego Bank was also described as useful by the participants. However, we also found that those outside cooperatives are at risk of missing the benefits of adaptation strategies in part due to lack of access to finance and training.

There was therefore an interest in exploring how microfinance might be optimised to support climate adaptation beyond its current products and to what extent access to climate-resilient solutions can be widened through financial inclusion.

This project seeks to answer the following Research Questions:

- How are MFIs positioned within the wider stakeholder network of climate adaptation and climate-resilient agricultural development in Rwanda?
- How can MFI policies and strategies be optimised to enhance the role of MFIs in enhancing climate resilience?
- What are the climate vulnerabilities experienced by individuals and communities in rural Rwanda, how might these change in the future and how can these vulnerabilities be addressed or mitigated?
- How can microfinance products and training be tailored to better respond to farmers and other (potential) clients’ needs whilst safeguarding local environmental quality?
- In particular, what services can be offered to benefit those who are at risk of being excluded from Agricultural Cooperative, Village Savings and Loans Associations (VSLAs) and Savings and Credit Cooperatives (SACCOs), or face other societal barriers (to be defined) for accessing finance?

This project focused in particular on Urwego Bank, the local partner of MFI Opportunity International, who funded this project. It was undertaken in parallel to the preparation of a proposal for a climate risk adaptation assessment and toolkit development for Urwego Bank, undertaken by MicroSave Consulting (2020).

1.2. Project overview

The project consisted of the following phases.

In Phase 1, 10 interviews were conducted with smallholder farmers in each of three rural districts of Rwanda - Gisagara, Musanze and Ngoma. An additional interview with the Agricultural Loans Officer from Urwego Bank was also conducted in each district.

In Phase 2, 270 surveys were carried out (90, 87 and 93 in Gisagara, Musanze and Ngoma, respectively). During these second visits, a participatory mapping exercise and transect walk was also conducted in each district.

In Phase 3, 10 interviews were conducted in Kigali Province with traders in agricultural produce, as an exploratory investigation of the extent to which the impacts of climate change on agriculture in the rural areas impacts on food supply in the city. A quantitative survey (n=100) and participatory mapping exercise were also conducted in Kigali.

In a final Phase 4, interviews were held with key stakeholders to consider the way forward for microfinance as a tool for climate adaptation.

1.3. Method

1.3.1. The research areas

Rwanda is divided into five provinces: Northern, Western, Southern, and Eastern Province and Kigali City. These are further divided into a total of 30 districts (Fig. 1). Research was undertaken in Gisagara District (Southern Province), Ngoma District (Eastern Province) and Musanze District (Northern Province), as well as in all three districts of Kigali: Gasabo, Nyarugenge and Kicukiro. This spatial selection was complementary to the areas sampled in the project by Helwig et al. (2020) when work was undertaken in Huye (Southern Province) and Rubavu (Western Province).

Over 80% of households in Rwanda are agricultural households. A recent Agricultural Household Survey indicated that the majority of farmers are older, less than 26% of farmers are between 16 and 30 years of age. Just over 87% own land, but despite this nearly half rented land. Just 12.6% of agricultural households belong to agricultural cooperatives (NISR, 2021).
Table 1 Bank accounts in agricultural households

<table>
<thead>
<tr>
<th>Province</th>
<th>Commercial banks</th>
<th>Savings &amp; credits cooperatives</th>
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<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Kigali</td>
<td>38.0</td>
<td>45.4</td>
<td>16.5</td>
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<tr>
<td>South</td>
<td>12.9</td>
<td>76.5</td>
<td>10.6</td>
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<tr>
<td>West</td>
<td>13.0</td>
<td>71.8</td>
<td>15.2</td>
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<tr>
<td>North</td>
<td>13.4</td>
<td>74.6</td>
<td>12.0</td>
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<tr>
<td>East</td>
<td>21.2</td>
<td>71.2</td>
<td>7.5</td>
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<tr>
<td>Rwanda</td>
<td>16.2</td>
<td>72.3</td>
<td>11.5</td>
<td>100.0</td>
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</tbody>
</table>

Source: NISR, AHS 2020

In 2020, 68.1% of agricultural households managed to save money in formal or informal institutions, whereas 38.7% had applied for a loan.

Gisagara

Gisagara is a district in the Southern province of Rwanda. Its population was 322,506 in 2012, of which 53% female. The population density was 375 inhabitants/km². Over 60% of the population is under 25 years of age. Almost a third (32.1%) of the population is identified as extremely poor and 27.3% as poor (excluding extremely poor), making this the fifth poorest district in Rwanda (NISR, 2012b).

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Three-quarters of the population lives in houses with walls made of wood and mud, which is much higher than the national average (35.6%). The district is amongst the lowest in terms of access to electricity, with just 2.4% uses electricity for lighting. Nearly 95% use firewood for cooking. Eighty-five percent of the population has access to an improved water source (NISR, 2012a).

The north-eastern part of the district (Mamba sector) is threatened by floods and landslides, whilst the larger remainder of the district is threatened by floods and landslides, according to maps in the Rwanda National Adaptation Plan of Action (NAPA) (Ministry of Lands, Environment, Forestry, Water and Mines, 2006).

Ngoma

Ngoma is in the Eastern province of Rwanda. The population of Ngoma was estimated at 233,000 in 2010-11. About 55% were under 20 years of age and about 83% under 40 years of age. In this district, the household size is also 4.8 on average (NISR, 2012c). Just over a quarter of heads of household are female (NISR, 2021a) Musanze is mainly an urban district, although it has peri-urban and rural areas too (NISR, 2012b).

Ngoma has average levels of poverty for Rwanda, with 25.3% identified as poor (excluding extremely-poor) and 22.3% as extremely poor (NISR, 2012c).

Ngoma has the highest level of properties with walls made of mud-covered tree trunks in Rwanda. The percentage of households with access to electricity is the same as in Musanze, 46.1% in urban areas and only 4.8% in rural areas. About two-thirds of households use an improved drinking water source whilst 20.9% use surface water as their main source of drinking water (NISR, 2012b).

The Musanze area is not highlighted on the flood, landslide and drought risk maps in the NAPA maps (Ministry of Lands, Environment, Forestry, Water and Mines, 2006).

Table 2 Bank accounts by financial institution and province

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The Ngoma area is highlighted on the drought risk map in the NAPA (Ministry of Lands, Environment, Forestry, Water and Mines, 2006).

Through the selection of these four districts, the project was able to consider areas with a range of climate vulnerabilities, in terms of population income and age; infrastructure; agricultural sensitivity and weather patterns.

1.3.2. Participant selection
Survey participants were selected in first instance through contacts obtained from loan officers at each Urwego Bank branch; these were cooperative leaders who then selected members from their cooperatives, based on the following criteria specified by the research team: number of men, women, youth, people with and people without loans, vulnerabilities, and people with good living conditions. Some additional non-cooperative members were also selected by cooperative leaders. These initial non-cooperative members were people who had tried to join the cooperative; these non-member contacts were then able to connect the team to further interviewees in similar situations.

1.3.3. Phase 1 – Interviews with smallholder farmers
The Topic Guide used for the interviews used in Phase 1 is included in Appendix I. To gain insight in vulnerabilities, farmers were asked if their lives had changed over the last five years because of the weather, in terms of food security, housing, migration, family life or otherwise; what community members had done to adjust to weather changes, to what extent this had been successful and what, if any, further action was planned; what changes they were expecting for the future, what concerns they had and what support they needed to prepare for these.

Respondents were asked about benefits and disbenefits of taking out a loan, loan decision making, what additional loan purposes could be identified, other financial service needs, repayment and challenges for repayment, and the consequences of defaulting.

We were also specifically interested in the experiences of people unable to access loans, so explored barriers to joining cooperatives or savings groups, possible loan provision for this group, and other solutions for financial inclusion that might be suitable for this group.

Interviews took place in the districts and were conducted in Kinyarwandan, translated into English, and thematically analysed using NVIVO software. Participant references in Kinyarwanda, translated into English, and thematically analysed using NVIVO software. The tabulated data is provided in Appendix II.

Figure 2 The community and research team during a participatory mapping exercise in Musanze.

1.3.5. Phase 3 – Kigali field work
The focus for the Kigali field work was on urban/peri-urban agriculture and on the links between rural agriculture and urban businesses:

- To what extent are SMEs in the urban food supply chain, and thus urban food security, affected by climate change impacts on farming or on transport systems and how can MF products and services be optimised to provide resilience?
- To what extent are urban and peri-urban farmers, who are understood to be predominantly focused on fruit and vegetables, affected by the climate change and how can MF products and services be optimised to provide resilience?

The focus was therefore not on direct climate impacts (such as urban flooding) but on indirect impacts such as disruption of the urban food supply chain resulting from climate impacts on Rwandan farming. Urban food was of exploratory nature.

Ten interviews with food vendors were held; the topic guide for the Kigali field work is included as Appendix III. Interviews were again conducted in Kinyarwandan, transcribed into English and coded and thematically analysed using NVIVO software. One hundred surveys were completed; survey participants were drawn from food sellers in all three districts Kimironko, Kicukiro and Nyabugogo. Tabulated survey data is provided in Appendix IV.

Three vendors took part in the participatory mapping exercise in Kigali, which focused on understanding the process of bringing produce to market and included value chain mapping.

1.3.6. Phase 4 – Stakeholder discussions
This phase included eleven stakeholder e-interviews with non-governmental organisations, MFIs, and private companies working locally in Rwanda in the field of financial inclusion, agriculture, development, and climate change. Stakeholders included: (S1) Opportunity International Rwanda Office, (S2) Access to Finance Rwanda, (S3) Hedera and European Microfinance Platform, (S4) SPARK, (S5) Sustainable Villages Foundation, (S6) Money Phone, (S7 and S11) Urwego Bank, (S8) The Sustainable Development Goals Center for Africa, (S9) The International Union for the Conservation of Nature, (S10) AlfaAight.

These interviews were conducted in English, transcribed and again coded and analysed thematically using NVIVO software.
The National Bank of Rwanda (BNR), the Ministry of Finance and Economic Planning (MINECOFIN), along with technical support from Access to Finance Rwanda, has set out the National Inclusion Financial Strategy where the goal is to support MFIs to develop ‘quality’ financial services and products accessible to all categories of the population, as well as to small businesses and farmers’ (Access to Finance Rwanda 2020, 1). In 2020, approximately 70 percent of the adult population in Rwanda relied on informal and formal credit and savings services and the primary use of credit was for development purposes, however, approximately 30 percent of the population, mainly women and youth, did not have access to credit or savings services (Access to Finance Rwanda 2020). Reducing financial exclusion for the ‘economically active poor’ through microfinance is a priority measure within Rwanda’s development policies alongside the aim of strengthening the resilience of MFIs themselves (MINECOFIN 2013, 6–8).

2.2. Policy gaps and institutional barriers for marginalised groups

Rwanda State of the Environment and Outlook Report 2021 (REMA 2022) reported that more work is needed to mainstream climate change adaptation within sectoral practices at the local level. Specifically mentioned were, ‘use of sustainable wetlands, sustainable land use and farming systems, response to initiatives that promote green technologies, and environmental budgeting in the sectoral plans and budgets’ (REMA 2022, 189).

Climate change knowledge and capacity building at the national level has seen rapid improvements, but further knowledge exchange is needed to enhance the knowledge and capacity at district and community levels. Effective coordination and active community participation across the extensive institutional and policy landscape of climate and the environmental protection has been a challenge that was highlighted in a review by the Rwanda Environment Management Authority (REMA 2022). The new National Land-Use Development and Master Plan 2020-2050 (RLMU2021) aims to address this by enhancing community participation processes in development planning and by strengthening the coordination linkages between authorities in national agencies and districts, non-governmental stakeholders, and local communities to include more local voices and preferences in development policies.

The gender and youth mainstreaming strategy by MINAGRI (2019) found that previous agricultural development policies, including the Fourth Strategic Plan for the Transformation of Agriculture 2018-2024 (MINAGRI 2018) and the National Agricultural Policy 2018, had limited knowledge on the institutional and cultural barriers affecting women and youth both in terms of their agricultural productivity and resilience to climate change. The policy documented key issues within the agricultural system. For example, women and youth experienced higher access barriers to loans, extension support, agricultural inputs, and technologies. They had fewer financial resources; youth are often asset-poor and women have smaller farm sizes relative to men. In Rwanda, 15% of households farm less than 0.3 ha and the majority of those are women’s farms for subsistence crops; 30% of all farmers in agriculture use less than 0.2 ha. These financial inequalities have implications for access to MFI loans and agricultural productivity. In addition, women’s seed preferences are not considered during species selection for integrating agro-forestry into farming systems (used for fuel) and the Crop Intensification Program (CIP), which has a focus primarily on export crops. Anecdotal evidence suggests that crops typically grown by women, such as sunflowers and ground nuts, are not eligible for procurement under the CIP of improved seeds. In addition, women have benefited less from government guarantee schemes. Only 8% of the beneficiaries of the rural investment Facility phase 1 (RFI) were women and 9% in phase 2 (RF2). Knowledge dissemination and capacity training on climate change is not channelled in an accessible format that is easily obtained and understood by all women and youth (digital divide, literacy levels, etc.). Fewer agricultural extension officers are women compared to men. MINAGRI suggests that this might explain another part of the reason for lack of engagement and communication by the promoter with women farmers in efforts to integrate climate resilient practices into local extension services and promote confidence in using new tools. To reduce these barriers, specific gender and youth mainstreaming implementation plans are required by stakeholder institutions to improve the climate resilience of marginalised groups.

3. DEMOGRAPHICS AND VULNERABILITIES

3.1. Demographic profile of the surveyed individuals

The project surveyed 270 local residents in the following districts: Gisagara, Musanze and Ngoma. Table 3 shows the breakdown of participants by location and gender. Throughout the report, survey results are only gender- or area-disaggregated where it appeared that there were important differences.

Table 3 Participants by location and gender

<table>
<thead>
<tr>
<th>Location</th>
<th>Men</th>
<th>Women</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gisagara</td>
<td>36</td>
<td>54</td>
<td>90</td>
</tr>
<tr>
<td>Musanze</td>
<td>54</td>
<td>62</td>
<td>87</td>
</tr>
<tr>
<td>Ngoma</td>
<td>61</td>
<td>66</td>
<td>93</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>151</td>
<td>119</td>
<td>270</td>
</tr>
</tbody>
</table>

Regional statistics show that over half of all farmers in each area are female; just below 60% in Gisagara and Musanze and 56% in Ngoma (NISR, 2020). Therefore, men were overrepresented in our Musanze and Ngoma samples.

The average respondent’s age was 44 (mode = 40, median = 42). The majority (87.5%) were born locally, with others having moved to the area more than 10 years ago (83% of those who were not born locally). The average household size was 6 people, with 3 adults and 3 children under the age of 18 on average.

In terms of education, most participants reported having completed primary education (67%). As many as 16% have no formal education, while 13% have secondary schooling, and 3% having an undergraduate degree (Fig. 3).

The vast majority of participants were Christian (over 97%), with the rest reporting Islam as their religion. Most participants were married (80%), with 1 out of 10 being single (Fig. 4).

Figure 3 Respondents’ formal education level

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Total Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>3%</td>
</tr>
<tr>
<td>Secondary</td>
<td>1%</td>
</tr>
<tr>
<td>Primary</td>
<td>67%</td>
</tr>
<tr>
<td>None</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Figure 4 Respondents’ marital status

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Total Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>80%</td>
</tr>
<tr>
<td>Single</td>
<td>10%</td>
</tr>
<tr>
<td>Divorced</td>
<td>1%</td>
</tr>
<tr>
<td>Widowed</td>
<td>8%</td>
</tr>
<tr>
<td>Unmarried</td>
<td>1%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Figure 5 Head of household by gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>60%</td>
</tr>
<tr>
<td>Women</td>
<td>40%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Figure 5 Head of household by gender

While overall, 68% of respondents were the head of their household, only 34% of female respondents chose this answer, compared to 95% of the men (Fig. 5).

On average, it was reported that on average, about 2 people in each household were working for wages or running their own business (including farming). When asked to indicate up to three main sources of their income, participants who are heads of household indicated agricultural production on their own/rented land as the main answer, followed by agricultural production on rented land (except Ngoma), skilled labour, and raising/trading livestock (Fig. 6).

Only 7% of respondents indicated living in a High Risk Zone as designated by the Government of Rwanda. Whilst risks are certainly identified in the districts surveyed (Ministry of Disaster Management And Refugee Affairs, 2012), the Government of Rwanda have already relocated people living in the high risk areas, starting with those most vulnerable to climate risks.
Almost 91% own their homes, with the rest renting (7%) or living free of charge (2%). In Rwanda, a socio-economic stratification system is in place, whereby citizens are assigned to so-called Ubudehe categories. Close to 56% of the surveyed individuals belong to Ubudehe Category 3, followed by 39% in Category 2 and just under 5% in Category 1 (none of which in Musanze). There were no individuals belonging to Category 4 in the sample (Fig. 7).

### 3.2. Agriculture

In terms of the top three cropping choices, the most common responses were maize (193), beans (191) and potato (104). There was a degree of variance across the three districts, with potato reported as the most common crop in Musanze (87).

When asked about the single most important crop for their household income, there were significant differences between the districts, with Musanze respondents relying entirely on potatoes, those from Gisagara relying predominantly on maize and rice, and the residents of Ngoma on maize, rice as well as coffee (Fig. 8). In terms of food security, most participants from Musanze rely on potatoes, while respondents from the other two districts indicated beans, maize and rice (Fig. 9).

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1 The number of Ubudehe categories and criteria have been subject to changes. Until 2015, there were six categories, which not only referred to wealth but also included a qualitative characterisation. These ranged from ‘the abject poor’ to ‘money rich’ and ‘food rich’. From 2015 to 2020, four categories were distinguished: Category 1 – very poor and vulnerable people, often homeless and unable to feed themselves; Category 2 – those who may be able to rent property, but are not gainfully employed and often can’t afford to eat more than once or twice a day; Category 3 – those who are gainfully employed and might employ others, including small farmers who have moved beyond subsistence farming; and Category 4 which include for example business owners, government employees or others in steady employment. From 2020, five categories are distinguished, referred to as A–E. This system places greater emphasis on the ‘graduation programme’ of upward social mobility. Those in categories A and B have ‘diverse life choices’ whereas those in Category E are entitled to full state protection (Rwandapedia, n.d.). Although our interviews took place after the introduction of the new system, our survey respondents always referred to categories as numbers, which leads us to assume they are still referring to the system in place between 2015 and 2020.

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### 3.3. Income

The average household income reported per month was 42,260 RWF ($41.55 USD), with considerable district-level variations (Fig. 12) as well as significant inequalities within the sample. The poverty line and extreme poverty line are currently $3.65 and $2.15 per day, respectively (World Bank, 2022). Although the data is not directly comparable due to the use of household vs. individual figures, our data reflects the fact that the sample included non-cooperative members, some of whom may be classified as poor or extremely poor. About a fifth of respondents in Gisagara, one in seven in Musanze and one in six in Ngoma indicated monthly household income levels of 10,000 RWF or below. Participants were also asked about their income levels in “good” and “bad” months, which varied widely as illustrated next.
Over half of all respondents (53%) admitted that their household expenses exceed what they can afford, followed by 38% who said expenses are around the same level as their income, and 20% indicating that they make more than they spend (Fig. 13). Relatedly, 21% of participants said that they do not manage to save money from month to month, while others manage to save via their cooperatives and savings groups (47%) (Fig. 14).

### 3.4. Infrastructure and services

In terms of local infrastructure, there is a moderate variation across the three districts in terms of the materials participants’ houses are built from, with tree trunks with mud and/or cement and mud bricks covered in cement making up the most popular answers (Fig. 15). The regional variation in wall construction in our sample is not typical for the three regions; according to the National Statistics 83.7% of people in Ngoma, 70% of people in Gisagara and just 42.6% of people in Musanze have walls made from tree trunks with mud, whilst 10.1% (Gisagara), 3.3% (Musanze) and 7.6% (Ngoma) have tree trunks with mud and cement. Mud bricks covered in cement are also less common than in our sample: 9.6% in Gisagara, 10.2% in Musanze and 2.3% in Ngoma. Wall type is important to assess the vulnerability of the building to landslides: houses with walls made of sun-dried bricks are the most vulnerable, followed by those made of wood and mud (Ministry of Disaster Management and Refugee Affairs, 2015).

Most residents live in areas with paved road access (80%), and report walking (87%) or cycling (11%) as their primary means of transport. To get to the closest big town using their primary means of transport, it takes participants between 35 minutes (Ngoma) and 44 minutes (Musanze), on average. When asked about their main source of lighting, most respondents indicated electricity (67%), followed by solar energy (21%). Only 4% reporting having no access to lighting. These figures are much higher than the regional averages reported in 2012 by NISR (2012a, b and c) and more recently by the Rwanda Energy Group (2022).

Fig. 16 illustrates the main source of drinking water for each household per district. Around 55% of all households have access to public tap or piped water. The same proportion of respondents report having to pay for their water. In Gisagara and Musanze, 14% and 17% respectively report using surface water, whilst only one respondent in Ngoma did so. Over half (51%) of all households boil their water prior to consumption, with 46% not treating water at all (with a disproportionately large number in Gisagara). In areas where there is greater reliance on surface water for drinking purposes, increasing use of agricultural inputs poses particular risks, as both pesticides and fertilisers can contaminate the water resource and pose health risks. These risks are not necessarily mitigated by boiling the water. On average, it takes participants close to 18 minutes to reach their main source of water. The mapping activities and transect walks confirmed that in all areas, some community members have to travel long distances to be able to access clean water.

The vast majority (96%) of households rely on firewood for cooking, with the remaining 4% using charcoal.
In terms of amenities, it was established during the mapping and transect walks that all sectors visited have schools. Murama sector (Ngoma) has a good road nearby, but Kansi sector (Gisagara) and Butaro sector (Musanze) do not. In terms of banking facilities, there are no physical offices of any MFIs in Murama sector; the MFIs instead deploy their agents. In Kansi Sector, a SACCO is present, but other financial institutions are further away, mostly in Huye. Urwego Bank’s field agents do visit the local community. In Butaro sector, several banks are present (Bank of Kigali, Banque Populaire due Rwanda and the microfinance bank Umutanguha, but none of these provide financial services to farmers. Urwego Bank is the only bank providing agricultural loans, but farmers have to travel a long way (2hr drive) to the nearest Urwego Bank branch, so they cannot access all financial services on a regular basis.

When it comes to the quantity of family ties, over half of the respondents in Musanze indicated that they regularly keep in touch with over 20 family members outside the household. This was just under half in Gisagara and just over a quarter in Ngoma. Ngoma also had the highest percentage of respondents who only kept in touch with 1-5 people, also just over a quarter of respondents. The vast majority (94%) of respondents reported receiving no remittances, with a small proportion receiving support from within Rwanda (<6%) or abroad (<1%).

4. CLIMATE EXPERIENCES AND MITIGATION

During interviews, in Gisagara, in the Southern province, nearly all participants mention either drought or intense sunshine, as well as heavy rain or (both fluvial and pluvial) flooding. Other impacts, such as landslides, wind erosion and hail were reported less frequently. During the Gisagara survey, droughts / irregular rains and floods were mentioned by about a third of respondents. In Ngoma, heavy rains and subsequent flood were also mentioned by nearly all interviewees, whilst about half of the participants reported droughts; in the Ngoma survey however, droughts or irregular rainfall was the most frequently mentioned (reported by 44 of respondents), whilst about a quarter of respondents reported flooding and excessive rainfall (Fig. 19). In Musanze, situated in a mountainous region, participants hardly mentioned drought or intense sunshine, but hail, heavy rain and flooding were experienced universally. The survey data confirmed this with 66 respondents mentioning excessive rainfall and 34 floods. One respondent said that the main impact [in relation to climate change] was that they suffered intrusion from wild animals.

In Ngoma and Gisagara, just under 30 of survey respondents replied ‘Not sure’, possibly indicating they had not experienced events they would categorise as ‘weather problems’. In Musanze, this was much less common at just 5 respondents.

4.1. Impact on the environment and on food production

Quantitative and qualitative finds are broadly consistent, in particular for Musanze. The near-universal mention of droughts during interviews in Gisagara is not reflected in the survey data, whilst droughts were more common in Ngoma than had been expected on the basis of the interviews. Even within districts, weather patterns can vary from sector to sector, which explains variation between interviewees and survey participants. In all areas, a majority of respondents believed that weather changes were a bigger problem than they were in the past (Fig. 20); consistent with Fig. 19 this was the most widespread in Musanze.

During the survey, a large majority of farmers reported having suffered losses from adverse weather conditions (Fig 21); in Ngoma, 72 respondents had lost subsistence crops and 28 had lost cash crops. In Musanze and Gisagara, just over half had lost subsistence crops and just over 40 had lost cash crops. In all areas, less than a third reported not having lost any harvest.
Did you lose any harvest due to these weather changes in the last growing season, and if so, were they losses of…?

- Gisagara
- Musanze
- Ngoma

### Figure 21 Loss of harvest due to weather changes

It appeared that the losses were substantial: figures of 40-70% were reported by many interviewees and reportedly, some farmers lost all harvest in some years.

Losses due to pests and diseases were quantified separately during the survey. In Gisagara, both pests and diseases were less of an issue than in the other two areas; whilst some had lost up to a quarter, greater losses were uncommon. Experience of pests and diseases were at similar levels in Musanze and Ngoma. Eleven and 8 respondents, respectively, said to have lost up to three-quarters of their harvest (Fig. 22) to diseases. Losses due to pests were reported by 14 respondents in Gisagara, 21 in Ngoma, and 22 in Musanze (Fig. 23).

Fertiliser was said to become too dilute to be effective in heavy rainfall, and increased fertiliser use was also reported.

Growing both cash crops and subsistence crops provided some resilience: “Normally if someone has a piece of land outside marshland, they are well off. Having a field here in marshland will be as an extra. So, they are not affected in the same way. For instance, if I am farming, I know that I don’t own any piece of land outside marshland, it’s different. For those who only grow rice in the marshland, if something happens to their crops in marshland, then that’s a big problem” (N1).

#### 4.1.2. Socio-economic and societal impacts

The impacts of climate change on people’s lives could be extreme: “People can die from starvation” (M8). Food security impacts were mentioned very frequently, denoting the direct impact climate change is having on people’s lives. One mentioned malnutrition, as with a reduced harvest, porridge flour ran out long before the next harvest period (G4). Another referred to famine and not being able to provide food for the children; another that (other) families ate only once a day instead of twice, or not at all, as a result of rising prices due to underproduction (M10). More generally, “disasters” caused “suffering” (G3); this respondent had experience of crop damages due to heavy rainfall as well as wind erosion.

Survey data confirmed the widespread food insecurity, with 28 respondents in Ngoma and 30 in Musanze reporting they had at times not been able to buy food in the past month (Fig. 24).

It should be noted that the research took place against the background of Covid-19, which will have compounded these figures. However, despite the pandemic, 30 people across the four areas listed drought or insufficient rainfall and another 11 listed floods and heavy rains (Fig. 25). Apart from malnutrition, other health impacts were also reported as a result of adverse weather: heavy rain brought a lot of mosquitoes for some (N2), although ‘health facilitators’ had helped by spraying pesticides. Two respondents had not been able to pay for health insurance (M5). And: “If the harvest has gone bad, the kids will go hungry and when one is hungry the sickness gets even worse” (N4).
Intergenerational impacts are clearly evident. Other than children going hungry or suffering malnutrition, loss of income also affected many people’s ability to pay for school fees (M6), which are typically paid after the harvest is sold. This sometimes resulted in children being taken out of school altogether (M7), or in having to pay in instalments and then having to take out an additional loan. Someone else had planned to have their second child after buying 10 acres (10x10m) of land for this child, but had not been able to buy the land (they had still had the child) (M4).

Respondents also reported not being able to buy clothes, or having to buy cheaper clothes than otherwise (G7). One had not been able to buy a motorbike as planned; this means that they could not be hired by the cooperative to work on the waterways which help carry the water to the farm fields. In this case, the respondent reported that they would not be able to borrow one when everyone else is using theirs, so they would end up spraying when it was already too late (M1).

One farmer noted that family members could not migrate because of the Coronavirus outbreak, indicating that the entwining crises can compound each other.

The losses had affected people’s ability to pay back loans, although some had insurance. Several respondents referred to disruption of their ‘financial capacity’ (G2), ‘progress’ (M1), ‘economic development’ (G9), or ‘financial status’ (N7), indicating both an ambition for progress and a certain level of financial literacy.

4.2. Mitigation of impacts

Only 39% of respondents felt they had the required knowledge and skills to deal with the effects of erratic weather. Nevertheless, a lot of farmers were aware of, or had engaged in, mitigating or preventative measures, and numerous successes were reported. Whilst in the 2019 research project (Helwig et al. 2020) farmers often referred to the application of fertilisers and pesticides or changing planting times as ways to mitigate climate impacts, in the 2021 project we heard much more evidence of improving water management and infrastructure and of planting grass and trees to prevent erosion.

4.2.1. Water management

A Gisagara farmer reported that water pumps had been installed, as part of a grant-funded research project (G1), to take water from the river into tanks. This was used to irrigate vegetable, maize and bean crops. Pumps were also installed for the rice fields; these had been paid for by the cooperative with the aid of a loan. Another farmer in the same area also mentioned having received government support for the cooperative to purchase pumps, although “...they are not enough” (G2). This farmer said that the cooperative was setting aside some money every year to save up for more pumps, estimating that about 20 were needed in total. One farmer reported that the purchase of water pumps had been made possible through a loan from Urwego Bank. Furthermore, an irrigation system was funded and installed by the government, comprising water channels, pipes and taps, as well as a ‘dam sheet’ placed in a forest uphill that provides pressurised water for irrigating the marshland (G4). This system however only served part of the area, as some lived too far from any water resources.

This was a concern for the coffee farmer we spoke to (N9). Zones (areas of ¼ ha) far from the irrigation system were said to be “lagging behind”.

A respondent mentioned that prior to the irrigation system, in some zones a labourer would be hired by the cooperative to collect water from a watering hole and irrigate the fields (G4).

The government had also given guidance on preserving water infrastructure: “If there is a water pipe, we should not damage it or that we should not cultivate anywhere near riverbanks which might cause an erosion and the river to be washed out” (G2).

Also in Gisagara, to cope with excessive rain and prevent flooding, a water diversion system was installed to protect the marshland. However, some of the parts were stolen or damaged. The cooperative planned to buy replacements (G2). Similarly, in Ngoma, pipes and a dam had been installed which protects crops during heavy rain (N3), although it seems that these do not provide protection against the heaviest floods (N6).

4.2.2. Erosion prevention

Farmers mentioned that to mitigate erosion, meetings were organised and contours were dug on the neighbouring mountain, which help retain the soil (G8). This was referred to as ‘community works’. The cooperative also applied for financial aid and cleared water channels; help with addressing siltation had been promised by the Director of Agriculture in Gisagara District.

This latter issue - soil sitting up water channels - was also reported in Ngoma. Here, a farmer who reported that water running from the mountains surrounding the marshland caused flooding, said they had tried to work on the waterways which help carry the water away. This respondent also mentioned that “...we also tried to protect the terraces surrounding so that at least the drainage channels that feed us water instead of them to be filled by soil and get disrupted; will only take in water and the soil will be retained in those terraces and in the contours that have been previously dug” (N1).

Both tree planting and contours (terraces) were seen as successful in this case in mitigating both the soil erosion and the consequent water quality issues (N1). N6 had planted eucalyptus trees up on the hill above their parcel, to slow down the flash floods and protect the vegetables they used to feed their family.

Elsewhere, trees were planted to mitigate wind erosion, although that farmer remarked that whilst the trees are still small, they do not offer much protection (N10). N4 also mentioned ‘Greville trees’, which had been planted in 2020, to offer effective protection from the wind within three years. Grass was also planted alongside the contours to protect the terraces from flooding (N10). This technique was also planned by cooperative members in Gisagara, who had learned about during a field trip to Gaherezo (G9).

4.2.3. Changes to planting

As in Rubavu and Haye (Helwig et al. 2020), the timing of planting was often seen as an important mitigation measure. It was thought to be essential to plant early; late planting exposes the vulnerable young plants to intense sunshine. Regardless, there is a lack of predictability of when the harvest will mature. Some farmers have moved to different crops or are doing so: in some parts of Musanze farmers are reluctant to grow potatoes, which has led to high potato prices (M7); in Ngoma, short-grain rice is more resistant to cold weather than long-grain rice (N1).

This also affected the timing of loans being requested: “We also alternate and consider climatic conditions so that we are able to tell them [the bank] at which time do we need the loan” (M1).

The type of seed, in this case Kinigi seed potatoes, had helped: Urwego Bank had “show[ed] us how to shift from the ancient way of agriculture to the modern one using quality seeds and by linking us with SPF” (M10), a fund that supplied Irish seed potatoes. It seems important that such funds are aware of the need to plant early: “so last time we fought hard and they gave us seeds earlier and we planted on the 24th of April” (M2). Farmers elsewhere also mentioned seeds suitable for the changing climate (e.g. N7). The reference to ‘modern agriculture’ reflects the language used in the CIP, where the use of agricultural inputs and improved seed is considered ‘modern’.

4.2.4. Pest control and fertiliser application

In Musanze in particular, to mitigate climate impacts, applying pesticides was commonly mentioned (M2, M3, M5, M7, N4). M2 explained this would help in case of drought as long as there was some rain. If there was no rain at all, then the additional investment in pesticides would be lost too (M2). In wet weather, pesticides were also seen as helpful. When rains were heavy, this would need to be applied more frequently and in higher concentrations than previously, to counteract the harm (M2). Another farmer reported that the situation was particularly difficult for those who did not own pesticide sprayers, as they would not be able to borrow one when everyone else is using theirs, so they would end up spraying when it was already too late (M1).

The application of (organic and inorganic) fertilisers was also mentioned as a way to mitigate climate change (M1, M10, M7, G3, N10, N5, N7) and again valued as ‘modern agriculture’ (M1). As N5 put it: “What we do in our agriculture to fight with climate change is to invest in having chemical fertilizer”.

Fertilisers are not always readily available, although accounts vary on this aspect. Several farmers mentioned TUBURA (the One Acre Fund) as well as the cooperate NGOS working in Rwanda), who appeared to offer fertiliser after initial payment of 20%, with the remainder payable later.

Figure 25 Most important problem affecting household
5. FINANCIAL MITIGATION AND EXPERIENCES WITH MICROFINANCE PRODUCTS

5.1. Financial mitigation and diversification

Among the farmers who indicated a climate and environmental impact as the most important problem affecting their household (17% of the sample), over 80% admitted that the issue caused a reduction in income. In these particular cases, less than 3% had fully recovered and close to 30% reported not having recovered, at all, with the rest having recovered only partially. The impact of poverty on recovery is unclear; whilst none of the Category 1 households and a disproportionate percentage of Category 3 households had fully recovered, a disproportionate percentage of the Category 3 households also reported not to have recovered at all (Fig. 26).

The potentially dire consequences of not having insurance are understood. Several respondents had involved in ‘mobilisation’ for insurance: trying to get others to join insurance schemes. However, there was also evidence of varying levels of understanding and, in one region, a lack of trust.

A family who was struggling to pay off their first loan was aware that someone from Urwego Bank would come out to assess the damage to their crops with a view to exonerating the loan, but seemed only vaguely aware that this was due to an insurance scheme or that a premium is added to the loan debt. Others (e.g. M6) however had a much clearer understanding of insurance.

A farmer in Gisagara (G3) saw crop insurance as important and had mobilised for others to join the insurance programme, but few did, due to an incidence where some cooperative members in a high-risk area had joined an insurance programme that had failed to offer support:

“Resp: Listen, we have a cooperative in KIGEMBE sector called NYAKANYERI RWADIGIKI, they paid for crop insurance but their area is highly prone to disasters and the insurance companies are reluctant to go for assessment when they are called by the farmers…. We also have KABOBOBOGO cooperative located in AKANYARU wetland. And all the streams converge in this wetland so farmers who own plot in MUKINDO, KIRARAMBOGO and MUGANZA areas are not covered by insurance.

Int: They don’t go those areas?

Resp: Yes, they fear to go there because there is always flooding in those areas.” (G3)

Further investigation is required here, but the suggestion that insurance is not available to those at greatest risk is concerning. If a farmer has no insurance in place, the cooperative will pay off the farmer’s- insurer loan, but this results in indebtedness to the cooperative, as well as difficulty paying water fees (G1).

Interviewees also highlighted that when they were affected by the climate, the insurance provided compensation for loan repayment only, but not for the income or contribution to household food normally provided by the harvest. In other words, it is the loan that is insured rather than the crop. As a result, they suffered from hunger when harvest losses occurred.

5.2. Insurance

Insurance is generally seen as an important mitigation strategy and the one provided by Urwego Bank through Radiant (insurance) was particularly mentioned (MT).

In terms of welfare support, only 2% of participants reported living in a household where at least one person benefited from in-kind food assistance - either food for work or free food distributions. Most of this assistance was Government-sponsored. Similarly, only 9% indicated forming part of a household that over the previous 12 months had benefited from financial assistance, including direct support, public works, financial services or Ubudehe credit.

Over 44% of survey respondents reported having participated in at least one training session over the last 12 months (the average being 15 sessions per person). Most of these sessions were compulsory and organized by Urwego Bank, and pertained to technical skills (53%), financial management (25%), health & hygiene (15%) and business development (7%). Training provided by agronomists (N7) and lead farmers (N10) had been experienced as useful. Almost 98% of survey respondents said that Urwego training sessions have improved their skills, with a similar percentage (91%) in the case of sessions not organized by Urwego Bank. There was some evidence of sharing good practice: “Only on individual basis, we teach people as individual the same practices we have in the cooperative and we teach them to apply that into their own fields” (N8).

Figure 26 Household recovery from losses

Households predominantly concerned with climate and environmental impacts indicated spending savings (19.5%), starting or increasing casual labour (15%), selling productive assets (9%), and borrowing money (4%) as a key financial mitigation and diversification strategy. For example, one (M2) had had to take on small jobs to pay off loans, as well as borrow from a friend. Some people had to sell assets (G7).

NI noted that having a FUSeO truck helped in times of natural catastrophes. They also remarked that owning livestock or motorbikes also helped the cooperative members cope by providing a second source of income.

5.3. Experience of adaptation support

When discussing mitigation, several respondents mentioned that others had been involved in various measures: ‘donors’ (N7); lead farmers (N10); the government, who provided guidance (G2); MINAGRI, who had visited the Musanze area (M6); Gisagaras District, who had channelled a central government subsidy for water pumps of 50% (G3) and fully funded and installed the irrigation system (G4); a research project that had paid for pumps (G1).
5.4.1. Intra-household loan decision and control

Most interviewees (both men and women) claim that the decision to take out a loan is made jointly after discussions between the spouses. This was reflected in the survey results, with 58% of respondents claiming decisions on loans are made in this manner. However, there are also households where the husband is in control of the decision, and conversely, where single female heads of households are in full control, though sometimes consulting their adult children. Accordingly, the split between men and women who said that they made loan decisions themselves is 54% vs. 46%, respectively. A few interviewees noted outright that there is inequality in the decision-making between the spouses (M4, M5), and that sometimes loans generate conflicts within the family (G6).

5.4.2. Loan application process for cooperative members

For cooperatives to apply for a loan via the cooperatives, Urwego Bank requires farmers to open an account and pay fees regularly; demonstrate the purpose of the loan (N1); fill out a form with the cooperative and obtain their authorisation (N6). The co-op checks internally a member’s ability to repay the loan; members make harvest pledges based on which the loan will be calculated (G2).

Sometimes, cooperative members are not aware which bank the loan comes from as the process is mediated entirely by the coop’s leadership; this may indicate poor cooperative leadership as information about the loan should be disseminated to all members.

Only 12% of Urwego Bank clients reported having loans with other micro-credit providers. These loans were spent buying fertilizer seeds, agricultural tools or equipment, and a number of other, household-specific expenses. For example, the Union of Cooperatives mediated loans from a factory for rice cooperatives, which were used to buy water (irrigation) pumps (G1).

Importantly, competitors’ loan processes are referred to as simpler and shorter (M2).

5.4.3. Use of loan

All but 4 survey respondents reported using their loans for their original purpose. The main reasons reported for diverting the loan were health emergencies (n=11), school expenditure (n=1), household consumption and subsistence crops (n=1) and for a different income generation activity (n=1). This highlights the purpose and use of the loan is not frequent in other contexts (or the microfinance sector in general where money is fungible; Jumpah et al. 2018; Cai et al. 2021) and likely relates to the design of the agricultural loans, particularly those of Urwego Bank, which prevent the loans from being diverted from their original purpose.

Some cooperatives had internal controls (e.g. having an agronomist) to ensure loans were spent and inputs applied correctly.

5.4.4. Benefits of loans

Generally, all the interviewed farmers were knowledgeable on appropriate use of loans for requested purposes and aware of the consequences and potential stress caused by loan mismanagement. Most reported they had benefited from taking out micro loans with Urwego or other MFIs and thought the advantages of loans outweighed any disadvantages.

In fact, the majority of those surveyed believed the products provided by the loans have overall positive or very positive impacts on soil quality, water quality, plants and animals, and participants’ health (Figs. 31a,b,c and d), although one thought impacts were very negative on all of these participants.

Elsewhere, concerns have been raised over the long-term impact of the use of inorganic fertilisers on soil and water quality (Cioffo et al. 2016; Cantore, 2011). Moreover, these adverse impacts can spread to neighbouring plots where no such fertilisers have been used (Cioffo et al. 2016). These issues were however not raised by our respondents.
Delayed receipt of loans, both to individuals and suppliers of seeds, was mentioned several times as a stressor caused by occasional "bad customer service" with reported disbursement delays of up to two or three months (N1, N2, N10, G10, M1, M6, M7). In such cases, farmers mentioned in that case to invest their savings in outputs meant to be financed by the loan, and use the eventually disbursed loan to cover these expenses later: "Yes, [bank/loan] help us, but we normally don't rely on them. We are actually supported by the cooperative, and the intervention comes late, for example when we need it in land preparation they provide it in weeding, then it helps not that much, because it is needed most in land preparation" (N3).

In the case of late disbursement, the repayment period is not adjusted accordingly. As one farmer explained, this can affect poorer farmers the most: "...[when] we are able to calculate the loan[and] cover them, but I am sure things are proceeding normally. But for those with no capacity, you see they get affected more" (N3).

5.4.7. Interest rates and penalty charges

Farmers also complain of high interest rates and penalty charges, and in the words of one of the interviewees: "There are times there are some conditions attached to the loan and [...] those conditions might be unbearable to the farmer" (N9). The main issue reported here were high penalty rates and then the reason for some farmers reported being confused by the interest rate or amount changing slightly from month to month, which decreased their trust in the lending institution. Relatedly, farmers also reported concerns about having to pay penalties and fines for late repayment due to circumstances that are beyond their control, such as adverse climate events.

Some farmers found that SACCOs were easier to deal with. Others noted that insurance is now required to get loans.

5.5. Reasons for reluctance to take out loans

It should also be noted that some farmers chose not to take out loans. This was sometimes because they had already achieved their financial goals and thus "graduated" from their VSLA. Similarly, the most productive farmers had been able to secure individual loans rather than group ones. However, a number of responses concerned the conditions of the loan products themselves. Here, participants cited high interest rates, short repayment periods, and late repayment penalties as particularly significant obstacles. At the same time, a perceived lack of clarity of financial institutions policies on climate disasters and the anticipation of climate change impacts were seen as making loan repayment very difficult.

A significant number of participants cited reluctance towards loans in general. More specifically, the reasons mentioned during the interviews included the fear of being in debt and the social stigma attached to it. The embarrassment associated with being a debtor, becoming socially isolated, losing other cooperative or VSLA members’ trust, losing land, and creating family conflicts were mentioned as strong deterrents. Loans are also seen by some participants as a stressful undertaking. This was not only because of the ever-present risk of bankruptcy, but also the uncertainty around weather variability and natural disasters, which have a detrimental and sometimes catastrophic impacts on yields. This was particularly an issue for those whose loans are unsecured.

Another category of responses in this context related to more external, political economic factors. Namely, some farmers believed that market uncertainty and price volatility make it very challenging to plan agricultural production, with or without a loan. People in Ubudehe Category I are not able to take out loans as they would not be able to pay them back. These are the most vulnerable in society and it is the Government’s responsibility to take care of them. However, in some cases, farmers explained that they have been approached by the Vision 2020 Umunurege Program Money, a government programme for poverty eradication, rural growth and social protection of the Rwandan Government in partnership with development partners and NGOs.

Finally, a number of personal reasons for reluctance towards loans was cited by interviewees. Some of them simply expected to be denied, which reflected the broader issue of low awareness about loans and how they work. Relatedly, some participants reported insufficient knowledge of rates and terms, and low confidence in their ability to secure and manage a loan - something that clearly reflected farmers' risk aversion and fear of losing collateral or having to incur late repayment charges. Some farmers, particularly young ones, were particularly sceptical of loan insurance schemes, preferring instead to spend money on food or other expenses. Lastly, in some cases, it seemed that cooperatives could be reluctant to involve particular members in group loan applications, especially when leadership do not believe the farmer in question is capable of producing the level of yields necessary to ensure repayment.

When survey respondents were asked for the reasons their household not having all loans at the moment, included in the following: "I don’t need one" (54%), "I can’t afford one" (no collateral or low income) (42%), "I don’t like having debt" (2%) and "I don’t know how to get one" (2%).

Among the survey respondents who said they would not take out a loan even if they were eligible (n = 66), 50% said they already had one, 32% said they didn’t one, 10% said they couldn’t afford one. Fewer participants indicated loan conditions, including the interest rates (5% of those surveyed), insufficient information/knowledge (3%), bad experience with loans (2%), bad leadership of their cooperative/savings group (2%) and fear of the husband taking over the loan (2%).

One participant said, concerning that the Rwanda Cooperative Association (RCA) favour bigger producers and advise farmers with 1-2 plots not to slow their cooperatives down and give up their parcels to more productive members (G1).

5.6. Loan repayment challenges and default processes

According to the survey the main factors that make difficult loan repayment are not operational but related to climate change (Fig. 32). However, the main operational factors was the repayment period (30%), although high interest rates (26%) and lack of knowledge about loan conditions (19%) were also mentioned (see Fig. 32 for regional variation).

Interviewees provided the following specific examples:

• The need to buy food rather than investing in agricultural production (M4)
• The process: “to beg the Bank”, wait for it to “decide your fate” (M8), and eventually getting clearance for selling your house as collateral (the Bank itself does not auction it)
• Climate change impacts reducing harvest and thus incomes (G2, G4, M7); people abandoning cooperative plots for hillsides due to climate change impacts (N7)
• The drought of 2017 was mentioned as an example of climate challenges (N3)
• People are sometimes reluctant to aggregate (or aggregate ALL) of their loan, thus, leads to difficulties in repaying (G1), also cooperatives leave farmers enough profit to live on - they don’t recoup the whole amount if payment is not if it is not enough to ensure survival (N3)
• Urwego Bank not taking disasters/climate change into consideration (N4)
• Reputational risk in the eyes of potential investors/entrepreneurs (N7).

In one cooperative, the previous leadership took a loan in 2014 which still hadn’t been repaid, very little understanding from Urwego Bank: “Those people from Urwego who destroyed us...” (G10, G3). The respondent alleged that accountants on both sides – the cooperative and Urwego – were appropriating money. On our second visit to Gisagara, we were informed about a 2nd alleged case of the repayment failure of cooperative members due to the president appropriating their money and disappearing.

5.6.1. Loan repayment process

The loan repayment process is described by one respondent as follows: farmers deliver the harvest to factory, the factory pays Urwego Bank, Urwego Bank deducts the loan amount and disburses the rest to cooperatives, cooperatives then disburse loans to members (G3). (Urwego Bank loans are always repaid first (G1).
Cooperatives can support their members in various ways. For example, normally, the loan is paid from the income of the farmer’s harvest. However, when the income of the season is not sufficient, the cooperative can pay the remainder and the farmers will reimburse the cooperative in the next season (N1). The cooperatives also help with sick people’s fields, not letting their harvest to go to waste (N6), as this would impact on their ability to repay.

Some remarks were made specifically in relation to VSLAs: firstly, that there was a VSLA safeguard of lending less than someone’s savings (25k vs 30k). Secondly, that some VSLAs made their members sell their collateral, rather than helping them out – VSLAs seemed more unforgiving than cooperatives in that respect (M7).

5.6.2. Loan default consequences for cooperative membership

For those affiliated with cooperatives, a notable drawback of loan default is the fact that in the case of some members’ defaults, it is the other members who need to foot the bill. Loans is the fact that in the case of some members’ defaults, it is the other members who need to foot the bill. For those affiliated with cooperatives, a notable drawback of loan default is the fact that in the case of some members’ defaults, it is the other members who need to foot the bill.

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Cooperatives will charge interest of their own, and block the ability to secure future loans to debtors (N3). The cooperative encourages farmers to manage their loans; if no improvement is seen after advising members with loans 3 times, these members are asked to step aside and “let the responsible ones take over” their plots (N3).

5.6.3. Loan default consequences for livelihoods

A range of impacts were reported as a consequence of loan defaulting. In terms of economic impacts, a respondent explained that losing a parcel of land meant losing income and therefore poverty (G4). Another referred to “sliding back” in terms of development (G5). Farmers may return to work as a casual labourer, working for others rather than for themselves (M7, N10). Cooperatives sometimes give debtors small jobs to recoup money in that way (N6). One respondent described livelihood diversification as fragmentation and indicated that many small jobs gave little security (N9). Some abandon farming altogether (G10).

Farmers reported authorities selling [their] assets on behalf of the VSLA/cooperative (G9, M1), including livestock (G6); having to use family savings to repay (G1); and having to rely on loans from other people (leading to personal debts and dependence) (M7). Impacts could be permanent: some get back on their feet, others “get unlucky and don’t get back up again. They stay down” (M9).

Defaulting also had social, psychological and health impacts: respondents mentioned isolation and anxiety as a result of frantically looking for money and sometimes eventually losing [their] own home (M8); family disputes (G6); and malnutrition or eating less nutritious food, e.g. sugarless porridge (G4). The latter could be a result of losing subsistence plots to repay debt (N4).

Less seriously, one mentioned losing their bonus for the holiday season from the cooperative (100k RWF) due to being in debt (N9).

Another interesting remark was that sometimes defaulting may be deliberate whereby the farmer knows the collateral is worth much less than the loan amount (M8). One person said people don’t know how to manage a loan in the first place (N5); another that there was a lack of one-on-one support for farmers who were defaulting (M8). A loan officer spoke of a need to keep farmers on track and follow up with them regularly on the part of the Bank.

Some members report no problems relating to defaults (G2, M3).

6. COOPERATIVES AND SAVINGS GROUPS AS FACILITATORS OF FINANCIAL INCLUSION

The Rwandan government encourages cooperative working; the public Rwanda Cooperative Agency (RCA) was set up to regulate and encourage cooperatives (RCA, n.d.a). RCA distinguishes five types of cooperatives; relevant to this project are Production Cooperative Organisations, which include farming cooperatives, and Savings and Credit Cooperatives or SACCOS, which are credit unions in which members of the same community combine their savings which can then be lent to the members (RCA, n.d.b). Furthermore, Village Savings and Loan Associations (VSLAs) are microcredit organisations of 25-30 members that also facilitate mutual savings and loans (UNDP Rwanda, 2022).

Bearing in mind that our sampling method reflected our interest in experiences with microfinance and started with recruitment via Urwego Bank, only 6% of those surveyed said they did not belong to either a cooperative or a savings group. Conversely, 28% were members of a farmer cooperative, 23% formed part of a savings group, and 44% said they were members of both. Figure 33 shows the district-level variations in these responses. The average cooperative and savings group had 369 and 40 members, respectively.

Cooperatives and savings groups have been identified as catalysts for financial and social inclusion, however their membership eligibility requirements can, on occasions, create inequality as those more financially vulnerable experience substantial difficulties in becoming members (Helwig et al. 2020).

Most of our respondents in the three areas of the study were aware of the benefits of taking part in a cooperative or a savings group. Many of the interviewees mentioned how participating in a cooperative or savings group would facilitate access to microloans. For example, in the words of a Musanze farmer: “Once you have full capacity, they can give you a loan and try your chances. That is how the cooperative helps the members.” (M6). Some members mentioned financial inclusion as their main motivation to join.

However, the most valued benefits were the collaboration and mutual help that members experienced. This help contributed to their financial stability and resilience. In words of one of our interviewees:

“The best advice I can give to people who are not in groups is that they should join. Because when you are in a group and your child fall sick, you will not worry about the medical fees; in groups, they pay for us health insurance. Like we have another group there where they pay for us Social security contributions (pension scheme/ EjoHeza). So, I encourage people who are not in solidarity savings groups to join so that they also belong somewhere. When you are in a solidarity saving group, you don’t eat food without salt and oil. You will not worry about body lotion.” (G7)

Another relevant theme that emerges is the progression from being financially vulnerable and starting in a savings...
The perception of cooperatives and savings groups was positive for all interviewees, with one of the members saying:

“Those people (who do not take part in cooperatives and savings groups). I can’t really know who those are, they are people who are behind me. I can’t really identify that they are these or these, but I would say that they are lagging behind.” (N2).

In Gisagara, respondents can see advantages for elderly women and youth to join the cooperatives. For example, the cooperative will give money to a young person who is getting married to support them through the transition and also help elderly women who can no longer work in the fields. For example, one said:

“There are also some elderly women whom we help to do most of the thing because they are too old. There are some needy people (elderly people) we have in our cooperatives that we help because we don’t want them to be alone sleeping in their houses (…) Because once a person is getting old, he/she starts to feel lonely and when we are with them, they don’t feel lonely.” (G3)

One of our respondents also mentioned that the cooperative in Gisagara was helping with construction of houses for those on lower incomes. However, this level of cross-member support did not seem to be the case for all interviewees and there were several barriers mentioned for elderly, youth and women to join and fully participate in the cooperatives and savings groups

6.1. Cooperative and savings group membership eligibility requirements and barriers
Both cooperative or savings group members and non-members were able to identify and understand the eligibility requirements of local savings groups and cooperatives, which appeared to vary slightly from area to area.

The main requirement identified by the interviewees to join a cooperative was the initial share fee. This fee, which varied in value (5,000-20,000 FRW, USD 5-20) depending on the cooperative and on what was included (e.g., parcels), was mentioned repeatedly by both members and non-members of cooperatives across the three areas in our study. In most cooperatives, this fee needs to be paid upfront and for many farmers who are not able to build up that sum it becomes a major barrier to membership:

“I can’t find the whole amount to pay at go” (G6). Some of our interviewees spoke about cooperatives that were more flexible and accepted instalments/deferred payment (across seasons) of the basic share:

“They don’t have to pay the entire 15 000 FRW to enter the cooperative. We can give them two seasons to pay the entire amount, they may say that if they cultivate this season, they will pay 7500 FRW and in the next season they will pay the rest (G9).”

Some respondents also mentioned membership fees and other regular payments that need to be made monthly to the cooperative. According to one respondent (G10) these fees include membership fees, health insurance, social security and pension contribution, taxes, and water fees to fill the needs for irrigation. This is a major barrier for non-members living on low-incomes trying to join. The same applied for the savings groups with one of the Gisagara non-members saying:

“i refused to join because I have seen many people who join and they are constantly on pressure to pay, and you may find someone has failed to pay. I have just waited to see if I can afford it. For now, I am not on the level to afford it, I can’t afford weekly contribution”, I may join and become indigent.” (G6)

Another requirement that becomes a restriction for the more financially vulnerable is the need to provide collateral such as, for example, property titles. According to one of our respondents, the Rwandan government has tried to tackle this issue in particular for women and youth through the Business Development Fund (BDF) credit guarantees. A BDF credit guarantee provides supplementary collateral for the borrower in order to fulfill the lender’s required collateral coverage ratio. The credit guarantee is a commitment by BDF to reimburse the lender a part of the loan in case of default. However, our respondents thought that cooperatives and MFIs in rural areas were not participating in this scheme and therefore they could not benefit from it:

“I hear about but I am in rural areas” (M3). In some cases, collateral can be flexible if the potential members have guarantors. When the farmers lack collateral, they ask someone who is already a member in the cooperative to be a guarantor for them. This person would ultimately pay any debt accrued by the new member. The guarantor needs to “testify for your integrity” (G4) or, in other words, that the new member is trustworthy and will work hard to pay their contribution and continue being a member of the cooperative.

6.2. Integrity, stigma and shame
These barriers became particularly strong for the most vulnerable groups, those living on low incomes and lacking collateral (youth, women, elderly).

Both members and non-members seemed to think of a person who would not join a cooperative or savings group as people who are: “weak, old and mostly vulnerable” (N5). Financial constraints seemed to be the most important barrier for these especially vulnerable groups not joining. Our respondent continued explaining when he was asked about why people did not join that:

“It’s because of lack of means. There are people who are really poor and when you even look at where they live, it’s just like a plot, they don’t have a decent house.” (N5). Some members stigmatised those who could not join explaining that these are people who are not trustworthy, who are weak and dishonest. Another respondent said they were “careless” (M5).

Some other respondents described what was called a “poor mindset” as a reason not to join (N10). This “poor mindset” was a consequence not of being poor but also uneducated and lacking confidence. This lack of understanding and sense of responsibility to the extent of the members was not only reported by cooperative members but also by the non-members themselves:

“And now that we have a small land, I just think and say I might get the money and having no soap, or being in need of many other things at home, and I would be a problem to others.” (G6)

This lack of self-confidence was also reported by non-members who did not want to access a loan.

6.3. Access to loans for farmers who are not in cooperatives
Most respondents agree that being part of a cooperative substantially facilitates access to loans. Some even present it as a “unique selling point” for young people to join and continue developing their cooperatives and groups:

“[Young people] join a lot because it is easy to get a loan when you are a part of a group than it when you apply as an individual” (M9).

However, some of the barriers for becoming a cooperative member linked to living on a low income and lacking assets such as, for example, financial security and collateral availability, were also mentioned as the main barriers to access a loan for non-members. Some participants argued that this was connected to not being able to invest the money and accrue benefits from the loan.

In a similar vein, one participant explained that another financial barrier to accessing loans, or to general financial inclusion more generally, were difficulties for individuals to open basic bank accounts as most banks require minimum deposits that sometimes our participants could not afford.

Another of the main barriers mentioned was lack of advice and basic financial knowledge. In particular, lacking information about the Urwego Bank procedures to approve a loan (basic loan requirements, what would qualify as collateral, type of activity that Urwego Bank would accept, need for guarantors and who would qualify as a guarantor, etc.). One of the respondents who was a cooperative member says: “I assume (that those who do not take out loans) maybe they lack people to give them advice. As I told you I used to work for people so we may share the harvest, it was not clearly whether these were Ubuube categories and perhaps Category 4 was not considered relevant for smallholder farmers, or that this is a different system of credit categories employed by lenders.
I didn’t have anyone to advise me, but because I was a member of the cooperative and we were so many members so I developed with the help of others, I used to have one plot and as of now I have so many plots, I told you that I applied for a big loan.” (N4)

However, the more nuanced reasons discussed by other participants both with and without loans are different relating more to fear and lack of confidence. For example, a male non-member in Musanze (M9) explains that “the first thing (why people do not access loans) is fear and the second thing is lack of knowledge”. This fear not to be able to pay back was also mentioned by other respondents. When asked about the reasons why single women and youth did not take out loans, one interviewee said it was because of “lack of means”:

“They are afraid and they are like I don’t have a parcel so if I take this loan, what will I do with it? (…) It’s the same with single women, they are like what if I fail to pay back and bring myself problems. That’s how it is.” (M3)

There is stigma associated to being in debt and participants know that it may be linked to being left behind in the community because you are not “of integrity”. It appears that (a) financial insecurity and low-income, (b) lack of education, training and mentorship, and (c) fear and lack of confidence are the intrinsically linked motives for individuals being unable to access loans.

7. SUGGESTIONS FOR LOAN PRODUCTS AND PROCESSES

We explored the suggestions for clients on new loan products and improvements to loan processes both in our survey and our in-depth interviews.

7.1. Loan products for climate adaptation

Most survey respondents (97%) do not believe they have the required money to deal with effects of erratic weather. Bank loans are seen as very useful to mitigate the impacts of climate change (Helwig et al. 2020) To explore what the respondents believed to be useful to them, in our qualitative work, farmers were asked how they would use a hypothetical loan of 200,000 RWF (sometimes adjusted upwards according to the experiences of the interviewees) to assist with climate change adaptation needs.

7.1.1. Agricultural inputs and emergency stocks

In our survey participants reported that the main purpose of their current loans was to access agricultural inputs such as fertilisers (n=74), agricultural tools or equipment (n=77), seeds (n=62), and pesticides (n=37) (NB. To our knowledge the loans were more expensive than those available on the market, and would prefer a cash loan so they could benefit from the lower prices (M2).

One farmer would like to be able to take out a loan to buy seeds on time; because you see now that we are cultivating one crop after the other respondents. When talking about the reasons why people do not access loans, one respondend said it was because of “lack of means”:

7.1.2. Labourers

In our qualitative work, many farmers from all three regions responded that if the loan was unrestricted they would use most of the loan to hire casual workers to ensure timely land preparation, ploughing and planting to ‘start the season earlier and avoid the loss caused by disasters’ (G1, see also G10, G4, G5, G7, G8, G9, M10, M2, M7, M9, N4, N6).

As one farmer in Gisagara explained, “If they gave me the loan, it would help cultivate quickly. I would also plant the seeds on time; because you see now that we are cultivating for season B, we really don’t have money now. What it means is that when you have money, you hire farmers, and they plough then you are left with making sure that the seeds are growing. We are planning to start planting on the 15th. Because it sometimes gets very sunny, the money would help me plough and plant quickly so that I get a bountiful harvest and then try to collect the harvest and then pay back the loan” (G9).

However, this emphasis during the interviews is not quite matched in our quantitative survey results where only 7 out of 109 respondents said that they would take a loan to pay for labourers (Fig.34). The reason for this could be that, when prompted, interview participants thought about a range of needs that the hypothetical loan could cover. However, in the quantitative question respondents were required to prioritise their needs so essential agricultural inputs – fertiliser, pesticides and seed – came first, although diversification to livestock or business activities were also relatively common.

7.1.3. Transportation, storage, equipment

Storage is important to avoid post-harvest losses. Half of our survey respondents reported they stored their harvest at the cooperative’s warehouse, with storing at home being the second most popular option (42%). This varied by region (Fig. 35).

In our in-depth interviews, one respondent in Gisagara suggested loans to renovate cooperative storage facilities in case of damage would be useful (G1). This cooperative was interested in building a larger and more secure drying ground for rice crops with double the capacity as the current one (G1). With the current small one, some farmers were unable to bring in their harvest at the appropriate time. Another suggestion by the loan officer was to make loans available for cooperatives to purchase power tillers. Farmers reported that sowing and processing machines for rice cooperatives were some of the hardest loans to receive approval for, but desperately needed (N2, N4, N6).

Loans for pesticide pumps would also be useful (M1).

Also, given that none of the farmers surveyed (n=270) had their own car, renting or purchasing vehicles for swift transportation of the harvest was also mentioned by farmers as another way to ensure their entire harvest made it to the cooperative storage, cooperative drying facilities, or market in time before rains or rot set in (N1, N2, N4). This was also confirmed as an often requested but rarely given loan product by the Urwego loan officers interviewed in Ngoma and Musanze.

One suggested a loan for digging contours and terraces (G7).

7.1.4. Water systems

Improved water management, including sanitation, is an essential component of successful climate mitigation
and adaptation strategies and, as such, one of the main concerns of research participants. However, water management systems and infrastructures require a level of investment substantially higher that what can be covered by an individual microloan for one farmer. Farmers were aware of this and, even if some of them suggested that Urwego Bank could offer community loans for water pumps (n=3), the most important findings were expressed in our interviews.

Many farmers thought loans could assist adaptation efforts if they were used to connect farm plots to reliable or sustainable water supplies and drainage systems; they had suggestions both for water collection (e.g. rainwater harvesting) and for water distribution (e.g. pumps and irrigation machines). In Gisagara it was suggested that loans could be used to install small irrigation systems and buy water pumps to channel water to the plots from the district dam (G2, G5, N9). One farmer explained why this was helpful in dry areas: “Yes, it can work, like we need that water. When there is a lot of rain, we can use the irrigation machine, and you would have a good harvest (…) For the irrigation machine, you need to pay a small amount of money and then NKUNGANIRE [A government Subsidy Program in the Agriculture sector mainly reserved for seeds, fertilizers and irrigation materials] takes care of the rest” (N7). One maize farmer suggested cooperative irrigation investments made possible by a loan product would be valued by other cooperative members in dry zones of Gisagara (G3).

Another preference was setting up sustainable rainwater harvesting systems by using loans to purchase roof water tanks, tarpaulins, spades, and hoes (G3, G6, G7).

Loans for ‘draining your parcel’ (G7) or for drainage machines (N8) were also suggested. Others suggested hiring workers and equipment to repair damaged water deviation channels and clear out submerged parcels in preparation for planting (G1, G7, N8). It was suggested that women might especially benefit from this in areas like the marshland where flooding was drastic and the clearing out was labour intensive. As one farmer explained, “...in some places where we cultivate, you may find that water is reaching at the level of the chest so that is a problem. In those places, women can’t be able to cultivate, so it would be good to get some machines that can help us to drain those places for us to be able to work in the marshland without any problems.” (N8)

7.1.5. Tree loans

One respondent in the qualitative interviews also mentioned tree planting activities: “If we plant trees, we protect environment, we are doing soil conservation and trees also provide fresh air. When we plant trees in the fields, they will increase soil fertility thus increasing production. There are also fruit trees such avocado, mango, passion fruit, lemon. All of those trees, you can request them for us so that we can plant them. They would help us” (G7).

7.1.6. Other views

In our survey sample, 11% of the loans had been requested for health needs. However, in qualitative interviews this product was not suggested. A few farmers said they would also use the loan as an emergency backup to cover cooperative fees (G1), and crop insurance (G3, G5, M8). One also suggested money for general purposes, such as house renovation or school fees (N8). During the survey, of those who did not have loans who said they would take a loan if eligible, 14% said they would spend it on developing or starting their own business, 5% on building or renovating their house, 3% on paying for school fees. One suggestion (during interviews) was for fuel efficient stoves. This is a traditional loan product offered by MFIs in Africa, which can reduce deforestation pressure and can contribute to climate change mitigation.

In our survey, 90% of respondents reported being able to access a smartphone. However, in the interviews one farmer said that loans could be provided to buy smartphones to access mobile banking services (N10) and climate, market or farming information. One farmer explained the difference digital access made for some farmers, “Maybe some of us use these small phones but those who have smartphone that can access WhatsApp are able get the market information right away, but for us it is very hard. The information is given to our seniors, like the agronomist and the president of the cooperative and it gets to us later. I would wish that if there is an information about the market, that the general public would be informed right away” (N8). This indicates that effective information flow within cooperatives cannot be taken for granted.

In summary, respondents said they would spend an unrestricted loan on inputs and activities for similar agricultural activities as they were already undertaking; larger machinery and collective storage facilities; livestock and poultry; measures and equipment for water management and erosion control; and non-agricultural activities such as construction, business, transport, and general expenses (Table 4).

### Table 4: Qualitative and quantitative (n=109) responses on what a non-constrained loan would be spent on

<table>
<thead>
<tr>
<th>Agricultural inputs, ag activities and ag expansion</th>
<th>Non-specific ag inputs / activities</th>
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</thead>
<tbody>
<tr>
<td>Seeds</td>
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<tr>
<td>Pesticides</td>
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<tr>
<td>Fertiliser</td>
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<td>Mulching materials</td>
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<td>Labour</td>
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<td>Renting / buying land</td>
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<td>Storage expansion / renovation</td>
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<td>Sowing/processing machinery</td>
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<td>Pesticide pumps</td>
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<tr>
<th>Livestock / poultry</th>
<th>Buying livestock or poultry</th>
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<table>
<thead>
<tr>
<th>Water management and erosion control</th>
<th>Water Pump</th>
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</thead>
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<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Digging contours / terraces</td>
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<tr>
<td></td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Rainwater harvesting (tarpaulins, rooftop tanks, spades, hoes)</td>
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<td></td>
<td>2</td>
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<td></td>
<td>Irrigation systems / machines</td>
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<td>Trees</td>
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<tr>
<th>Housing</th>
<th>Build / extend / renew house</th>
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<td>5</td>
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<tr>
<td></td>
<td>Business</td>
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<td>17</td>
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<tr>
<td></td>
<td>Transport</td>
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<tr>
<td></td>
<td>Motorbike / Car</td>
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<td>2</td>
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<tr>
<td></td>
<td>General expenses</td>
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<td>Cooperative fees, insurance, health needs</td>
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<td>Smartphone</td>
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<tr>
<td></td>
<td>School fees</td>
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<td>4</td>
</tr>
</tbody>
</table>

Table 4 Qualitative and quantitative (n=109) responses on what a non-constrained loan would be spent on
7.2. Other loan product recommendations by clients for Urwego

Both in the survey and in the qualitative interviews, the majority of research participants reported favourable experiences working with Urwego. Nevertheless, there were a few suggestions on ways to improve the loan products so they contribute to climate resilience. Some recommendations have direct links to improving farmers’ ability to manage their farming activities when impacted by climate disasters. Other recommendations relate indirectly by improving the productivity and income security of farmers which improves their adaptive capacity generally.

7.2.1. Loan disbursement and repayment schedules

In relation to delayed disbursement (see Section 5.4.6), one farmer suggested the disbursement of funds should do its best in speeding up the process because sometimes that is one of the challenges we face, being granted a loan when the season is mid-way. And you end up not using it for the intended purpose or plant potatoes in the period when you want to speed up your activities, yet laborers are asking for much money” (M6).

Another recommendation by clients was for grace periods in the repayment schedule with possibility to postpone repayment until next season or for extra months for URWEGO agricultural loans (G1, M1, G8).

On loan duration, for one farmer, five months instead of the previous four-month repayment schedule had improved their capacity to pay back after harvest. However, for other farmers, six months was still considered too short. Another farmer suggested two years for large loans should be offered to farmers with the capacity to manage (N9).

For loans to cooperatives for water pumps and irrigation investment the suggestion on loan repayment to span over two seasons instead of one.

7.2.2. Ways to make loan repayment easier

In the in-depth interviews, suggestions to make loan repayment easier (see section 5.6) included specific suggestions for support when disasters hit: to extend a loan repayment (M1, M7), to lowering interest rates in such cases (M1, N3), and to be given an extra amount for supporting their survival, as an emergency loan, that could be repaid together with agricultural loans in the next agricultural seasons. Currently, the ‘small savings group’ can sometimes provide emergency loans, but at much higher interest rates than the bank (M7).

More generally, participants would like more flexibility from the Bank when it comes to penalties (G10), lower interest rates (G3, N9), no interest increases mid-loan (G4), and better explanation on how interest rates work, as currently they may be confusing and lead to disputes (N3), and better overall conditions of the loan in terms of interest rates. Eligibility, collateral requirements, turnaround of loan disbursement, and penalties (G8) were also mentioned. People also felt that the bank should ensure people are not lent more than they can afford to repay (G3) and that more consideration and flexibility were needed as currently penalties are added on top of old loan, creating a spiral of debt (G9). One would prefer individual loans to collectives to reduce the possibility that they can’t get something out of it and grow slowly, until they get to work with financial institution” (N2).

A number of respondents agreed that the most vulnerable groups should not receive a loan without more comprehensive training and advice pre-loan and a closer follow-up not only in terms of repayment but also in terms of how the business evolves. They agree that a loan can worsen the situation of people who are not able to manage it: “It very challenging to make them understand especially if they drink or spend the money elsewhere.” (N6)

Two respondents said that debtors registers needed to be updated regularly (NT, N2). This can be a barrier to accessing loans: “Another challenge we face with financial institutions is that we submit to them the list of farmers and even after paying back the loan, those institutions keep having them on the list of debtors, therefore it becomes a hindrance to being able to get a loan and during two consecutive seasons, because in their machines, the farmer is still registered as a debtor while you have already cleared the debt. That also is something we think they should change. They should remove our farmers from the list of debtors right after we finish to pay back the loan.” (N1)

8. BROADER SUGGESTIONS FOR ADAPTATION SUPPORT

Farmers also provided broader suggestions on what further adaptation support could help.

8.1. Training and consultancy on climate and agriculture

According to our survey, more than half of the farmers interviewed (61.5%) considered they did not have the required knowledge and skills to deal with the effects of erratic weather. Training and education are key to support the positive impact of microfinance on borrowers (Santos et al. 2015). When asked what topics would be brought to training for Urwego banks’ clients (see Section 5.3), these currently do not appear to include climate-related issues.

One respondent felt the government has the responsibility to train people, in collaboration with the banks. Village leaders also have a role to play in ensuring that people who are not motivated or afraid attending training (M3). Several others also mentioned they would like more training (N1, N6), in particular on agricultural methods (M9). Training on fertiliser and pesticide use was also mentioned. Another felt that training in farming should include: environmental conservation; it should be noted that this referred specifically to darn maintenance (N7).

As to specific training activities, field trips, e.g. to demonstrate the effectiveness of irrigation systems, were seen as useful (G5). Two respondents would like to see more of Urwego banks’ agronomists present to inspect the crops and talk to clients (N1, M7) and one expressed that agronomists don’t come when you need them: “They are not usually available […] Sometimes you call them and they don’t pick up, you want them to at least come and give you advice. And the fact that we suffered such extensive losses, to the point where we don’t want to be in groups anymore, is partly because we used to call them and they refused to come and see what disaster had affected the potatoes and advances we had been given. […] And they have studied to become agronomists, but when you call them to ask them to come and examine the causes of powdery mildew disease or examine why the pests attacked the potatoes, they don’t come.” M9 had a similar experience, but M8 had found the agronomists available and helpful. In Ngoma, the cooperative employs a regular agronomist (N1). N5 also stated that an adviser was available for every village, but that this had been disrupted by Covid.

A wish for training from “experts on climate change” was expressed (G5), including advice on what crops to plant in the future.

Other topics requested were disaster mitigation (G3), how to use water pumps for long-term (i.e. 3-6 months) weather forecasts (G5, M9), technical / agronomist support (G5), ways to cope with climate change (M3), appropriate use of fertilisers (M4, N9) and quality of seeds (M4), and pest control (M5, M6).

Training was also seen as a way to secure buy-in for certain measures farmers may be reluctant to undertake otherwise, for example taking out insurance.

In the survey, when asked what other topics respondents would like to see covered in training, the most common responses related to business and financial management, agricultural training (with a range of specific requests), conflict management, cooperative management, and weather or climate training; the latter mentioned by 11% of those who answered the question (Fig. 37).

8.2. Role of the cooperative

Cooperatives played an important role in ‘mobilisation’, persuading farmers to take appropriate action or join in certain programmes. This could for example include investment in water pumps (G3) or taking out insurance.

Cooperatives also organised ‘community work’ (G3); this includes clearing out the drainage channels every week and digging contours (G8).

8.3. Role of the government

The support participants would like to see support from their government can be categorised into three forms: information and technical training; practical, provisioning or infrastructural support, and financial support, financial advocacy and price regulation.
In Kigali, we sought to explore whether the effect of climate and weather changes on fruit and vegetable production affected the quality, availability or price of food. These issues were discussed with food vendors, who also commented on their experience with microfinance. Again, 10 interviews were held; 100 traders responded to a survey; and three traders took part in a Participatory Mapping exercise.

### 9.1. The research participants

Interview participants had been active as fruit and vegetable traders for periods ranging from 1–24 years, with an average of just over 9 years. The length of experience was similar among survey respondents, with just over a quarter having been trading produce for over 10 years. Two interviewees were male and the remaining 8 female; similarly, 20 survey respondents were male and 80 female. Four fifths of the male survey respondents were head of their household, compared to a third of all female survey respondents. Most men were in Ubudehe Category 3 (see footnote on p.11), whereas most women were in Category 2. Only 1 male survey participant was in Category 1 (Fig. 38). Of the survey respondents, 62 had completed primary education and 22 secondary. Twelve participants, all female, had had formal education. Interview participants sold bananas, Irish potatoes, water melon, tomatoes, carrots, onions, peas, oranges and pineapple; some sold more than one product. Survey respondents sold a wider variety of produce, tomato (37) and beans (34) were the most common but carrots, onions, eggplant, and bell pepper also were mentioned by more than 20 respondents each. Tomatoes were most frequently mentioned as the most important in terms of income. Trading was everyone’s main source of income. Only two survey participants, both female, made money from agricultural production. Those who were not the head of household mostly reported that their head of household earned a livelihood through skilled (25) or unskilled (15) non-agricultural labour, with transport (5) and own business/self-employed (7) also reported. Nine female respondents who were not head of household said that there was no other source of income in the household, indicating that being the breadwinner does not equate to being the head of household.

### 9.2. Process from farm to market

The process to get produce from the farms to the market is diverse. One vendor explained they call the growers to agree a price and order the produce, which is then delivered by car by the growers to the vendors. The cooperatives are in charge of loading the cars. Some vendors are also associated in cooperatives, in which case the negotiations are between the two cooperatives (K3) and regular business partnerships are established. One vendor said that, in addition to this process, when they heard of cheap produce being available, “then I take a car and go” (K2). Some of this was then sold on to other vendors. Vendors also visit the growers to ‘get connected’ and establish trust.

Both vendors and growers contact each other by phone to agree sales and prices. If a product is hard to get, “you go search everywhere to the villages and get it” (K3). Not all vendors get produce delivered to them: K5 normally used her own vehicle to go to the provinces and collect the produce. Several vendors pointed out that transport fuel is expensive.

Vendors also buy from larger markets, notably Kabuga and Nyabugogo in the Kigali City suburbs, or collection centres. The process and value chain from farm to market for the example of tomatoes is summarised in Fig. 39 and Box 1.

### 9.3. Weather and climate impacts in Kigali

Vendors reported that weather and the seasons impacted on the availability of produce, either generally or for specific regions. It was not always possible to clearly establish whether the impacts described were due to seasonality, due to specific weather events, or to longer-term, climate-change changes, and indeed it would be difficult to establish this for the participants. Reference was however made by a number of interviewees to extreme weather events, in particular drought and heavy rain, and to shortening or lengthening seasons.

Survey respondents were asked about weather impacts affecting Kigali, and almost universally reported that weather changes were a bigger problem now than in the past (93). High temperatures and excessive rainfall were most commonly reported (Fig. 40). This had caused very significant losses; no less than 72 respondents mentioned they had lost some (30) or most of (42) their sales. The value of these losses was RF 256,000 on average. Several interview participants described drought or heavy rainfall events that had led to reduced availability.

**Figure 38 Ubudehe category by gender (Kigali participants)**
Figure 39 From field to fork: process and transport arrangements

Figure 40 Weather impacts affecting Kigali

A watermelon grower, described damage by heavy rains (K1); K6 described how landslides on the hillsides affected the availability of peas: “You understand Kigali is supplied by the villages. [...] Then imagine when the village has faced a loss and didn’t harvest. [...] And when there is no food in the village, so there isn’t in Kigali” (K6).

For most produce, the changes reported were reduced quality, reduced size, or different types being available (bananas, K3 & K8; potatoes (K8), water melons (K1), tomatoes (K10)). Potatoes can also suffer post-harvest, as they rot when they get wet (K8). The season affects both the quality and quantity of tomatoes; when tomatoes are expensive or of poor quality due to the season, customers buy processed tomato paste instead of fresh produce (K10).

9.4. Changing origins

Most vendors interviewed had a good understanding of where their produce was grown, but some didn’t:

Int: So, where do you get those fruits from?
Resp: We get them from Nyabugogo (A suburb of Kigali City), we don’t know where they come from.

Others explained that produce is sourced from different areas according to the season (K3) and that when Rwandan produce is scarce or expensive, produce can be imported from Tanzania (watermelon, K1) or Uganda (potatoes, K8). Survey respondents indicated that their produce was normally sourced most commonly from the Kigali districts Nyarugenge (47), Kicukiro (11) and Gasabo (9), but many other districts were also mentioned, mostly in the North and East of the country.

Two-thirds of survey respondents reported that it was now more difficult to procure than in the past; just over one third reported they lost access to any kind of produce because of bad weather without being able to find an alternative supplier. Two thirds had changed suppliers due to bad weather (19 once and 46 more than once) and 47 reported that the produce from the alternative supplier had been more expensive than that from their original supplier. A few interview respondents also reported decreasing availability over a longer period (the past five years), e.g. for oranges and pineapple (K7).

Just under a fifth of respondents said that they had had to change from Rwandan suppliers to international suppliers due to bad weather, most commonly Tanzania. This was most commonly the case for Irish potato (6), which was consequently sourced from DRC, and tomatoes (4), for which the sourcing shifted mostly to Tanzania. Changes in the other direction were less common: only 6 respondents said they had changed from international sources to using Rwandan produce due to weather.

Just 10% of respondents said they had had to change the type of produce they sold.

9.5. Price instability, quality and conflict

When vendors had to change suppliers, nearly three-quarters said they had to pay more. Of these, a third said they then charged higher prices to their customers, 8% said they charged the same, and half declined to answer. The survey respondents overall did not report problems with quality specifically after changing suppliers (some said this was lower but more said it was higher).

Asked about price trends generally, 89% of respondents...
said they were selling at higher prices than they had been in the past. Consistent with the interview data, over half of all survey respondents reported that bad weather had caused reduced availability, inferior quality and increased prices (Fig. 41).

9.6. Food security and food self-sufficiency

It would seem that vendors were, on the whole, able to find alternative sources of produce and that they are indeed used to switching suppliers with the changing seasons. Regardless, most vendors suffer financially, whilst availability and quality issues lead to price instability. Based on the data collected, impacts on urban food security and food self-sufficiency are therefore mostly related to these price fluctuations and occasionally to reduced choice or quality. Whilst some imports replace Rwandan produce, the opposite would also appear to be true, although to a lesser extent.

Most vendors (88) did not grow food for their own household. Those that did most commonly mentioned beans (11) and this was also the crop indicated as most important for the household’s food security. Nearly a quarter reported that in the past month, there had been times where the household had not had enough money to buy food.

Disadvantages of taking loans mentioned included the cost of repayment; the burden of constantly being asked for repayment; uncertainty of earnings which might make repayment difficult; the risk of auction if unable to pay. Defaulting was seen as a problem, although always reported about ‘other people’. It was suggested by one interviewee that periodic checks could be made to ensure the loan was used for its intended purpose.

Many interview respondents, though, had positive experience of the loans. They said it had helped them to grow their business, to buy a home, to have a good standard of living, and even send their children to school. Having a loan had inspired one to work hard; another one to plan better.

What typically makes it difficult to repay a loan, either for your household or for other households in the area (Kigali)?

When asked what typically makes it difficult to repay a loan, either for their household or for other households in the area, the most frequently mentioned issue during the survey (open question) was a lack of knowledge about loan conditions (Fig. 42). Of those who indicated ‘other’, nine mentioned a lack of demand (including due to Covid-19). Only one survey respondent indicated that weather-related problems had affected their ability to repay. One interviewee related that they had had problems with business suppliers defaulting and several said they had defects with suppliers (K4, K5), mentioning that hotels in particular were likely to do so (K5). Several said business had been disappointing which had led to repayment problems. One said they had taken informal loans for from their fellows to be able to pay back UB (K7).

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9.8. Suggestions for change

As for their recommendations on what could be changed to UB loan products that would help the vendors deal with current challenges, 16 survey respondents made suggestions; of these a longer repayment period was by far the most frequently mentioned. Quite a few interviewees also mentioned this; the weekly repayments are seen as an encumbrance. Another suggestion was that individual loans without collateral would be desirable:

‘Ceeeh, when there is no individual collateral then, you come together in a group and everyone becomes each other’s collateral.”’ (K9).

Asked what else would help their work as a produce trader, a reduction in taxes was commonly mentioned. Other common themes were again a reduction in interest rates, the ability to take out loans without collateral or being able to take individual loans rather than as a collective, longer repayment periods, business skills, and cash support for expanding the business. Two interviewees suggested that perhaps the Ministry of Agriculture (MINAGRI) could bring sellers and buyers together.

Radical terracing is a method used widely by Rwandan smallholders whereby ‘reverse-slope bench terraces’ are created with risers stabilised with grass (WOCAT, 2014). This method can be very effective at reducing erosion; however, Karamage et al. (2016) warn that the very marginal, steep slopes are currently farmed by the poorest farmers and that terracing may lead to them being deprived of their lands.

For this final part of the study, the research team interviewed 11 experts who were purposefully sampled to offer rich perspectives on microfinance services and products as well as other climate-related innovations in the Rwandan context. The potential and limits of microfinance as a catalyst for climate justice were explored.

10.1. Potential and limits of microfinance for climate resilience in the agricultural sector

The stakeholders interviewed confirmed that the microfinance products and services proposed by the farmers to increase their own resilience to climate change were “typically requested products for climate change for rural livelihood resilience” (S1). Products and services (Table 6) were acknowledged by the stakeholders who had experience in programs targeting smallholder agricultural development and financial inclusion (S2, S3, S4, S5, S7, S8).

Several current and innovative examples of microfinance products and services increasing climate resilience were mentioned by respondents (S1–S10): (a) small, productive, agricultural microloans targeted at financially-excluded and vulnerable groups of farmers (those living on low incomes, women, youth); (b) individual agricultural microloans to support vulnerable individuals in the final stages of ‘graduation programmes’ organised by the public and third sector; (c) savings products that enable asset accumulation and cushion for emergencies; (d) index insurance products (offered separately or bundled with microloans) to protect from weather events; (d) agricultural loans tied-up to particular climate friendly uses such as tree planting to mitigate soil erosion and (e) digital/mobile finance applications to improve financial inclusion of rural areas. However, the limits to what microfinance services and MFIs – on their own – can achieve were also articulated.

One of the primary concerns for stakeholders was the need for large-scale environmental protection solutions to address deforestation, unsustainable land-use, and soil erosion. For example, solutions such as tree planting, radical terracing, or switching to sustainable crops were mentioned. These solutions, which require farmers to ‘buy-in’, may not show immediate financial returns on investment (S1, S8, S9, S10). Some interviewees believed that MFIs could incentivize farmers to invest into long-term environmental protection initiatives, such as fruit tree planting alongside current crops, for example mango or avocado trees which protect the soil from erosion and have formal market value, or introducing a new, more resilient, crop. For this, microloans would need to be designed with
Table 5 Stakeholders interviewed

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<th>ID</th>
<th>Organisation</th>
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<td>Opportunity International</td>
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<td>Access to Finance Rwanda</td>
<td>National policy level policy influence - financial inclusion</td>
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<td>53</td>
<td>Hedera &amp; e-MFP</td>
<td>Digital solutions and impact assessments of Sustainable Development Goals</td>
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<td>SPARK</td>
<td>VSLA’s and microgrants</td>
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<td>Sustainable Villages Foundation</td>
<td>Development and access to basic services, most marginalized groups</td>
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<tr>
<td>56</td>
<td>Money Phone</td>
<td>Digital solutions/mobile money for MFIs</td>
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<td>57</td>
<td>Urwego Bank</td>
<td>MFI - Group and Agricultural Product Manager (S7); Director of Business (S11)</td>
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<td>58</td>
<td>The Sustainable Development Goals Center for Africa</td>
<td>Regional and national policy influence. Models for integrating partnerships in development, financial inclusion, and basic services e.g., water and sanitation management.</td>
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<tr>
<td>59</td>
<td>IUCN</td>
<td>Nature conservation partner. Models for environmental conservation funds at community level in partnership with MFIs</td>
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<td>510</td>
<td>Kumwe/Afla Sight</td>
<td>Private sector partner - Reducing post-harvest losses from SHF production.</td>
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Table 6 Summary of products and services requested by smallholder farmers

**LOAN PRODUCTS**
- Agricultural inputs choice of seeds, pesticides, fertilisers, labourers
- Agricultural infrastructure irrigation systems, storage and harvesting equipment, post-harvest storage,
- Environmental protection terracing, tree planting, dams, water channels, sustainable land management
- Livelihood diversification livestock and non-agricultural
- Redesign loan disbursement, schedules, interest, penalties
- Emergency funds interest free loans, grants, or in-kind support

**SERVICES**
- Weather forecasts real-time and seasonal knowledge
- Agronomist advice sustainable farming, environmental conservation
- Training financial literacy, business acumen and transportation entrepreneurship, climate change
- Equitable insurance access and coverage for high-risk areas
- Collateral guarantees for assetless youth and women
- Government agri-finance outreach in rural areas
- Market linkages and price regulation
- Information brokers of programmes, grants, financial inclusion

It was acknowledged that it could be challenging for MFIs to provide these longer-term products in a financially viable way. Partnerships and linkages between MFIs and other public and private actors supporting climate resilience, including governmental programmes, NGOs, regional government, and private companies in Rwanda, were seen as crucial to the development of the sector. Several models in the early stages of planning were mentioned as examples developed through such partnerships (for example, mobile or digital money) (S1, S4, S5, S6, S7, S8, S9). Some of these partnership models are detailed in section 12.3.2.

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One respondent gave examples where communities have been successfully using indigenous solutions for rainwater harvesting and underground storage to manage drought for the last 50-100 years (S8). It was suggested that non-financial services of this kind could be scaled up to provide these longer-term products in a financially viable way. Partnerships and linkages between MFIs and other public and private actors supporting climate resilience, including governmental programmes, NGOs, regional government, and private companies in Rwanda, were seen as crucial to the development of the sector. Several models in the early stages of planning were mentioned as examples developed through such partnerships (for example, mobile or digital money) (S1, S4, S5, S6, S7, S8, S9). Some of these partnership models are detailed in section 12.3.2.

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Most stakeholders discussed and confirmed the general findings that, beyond microloans products, improving farmers’ climate resilience required: food security; linkages to urban supply chains; access to water supply and irrigation systems (including clean water free of pesticide contamination); water management; energy and electrification; sanitation systems and post-harvest management technologies.

Relatedly, several stakeholders mentioned that one of their current concerns was how to ensure that green climate finance investments at the national level funnelled down to the smallholder level and were targeted at the correct areas, products and communities who needed it most (S1, S2, S3, S5, S8). Microfinance was considered one instrument to secure that these green investments reached smallholder farmers at the frontline of climate change given that one of the main challenges for the sector, repeated by most stakeholders, was securing adequate, sustainable capital investment to provide affordable micro-financing programs on a large scale for products requested by small-holders and cooperatives (e.g., irrigation systems, post-harvest technology, transportation, storage, and market delivery infrastructure) (S1, S2, S4, S5, S8, S9, S10). A couple of stakeholders, however, confirmed that for many subsistence smallholder farmers, the current design of microloans with high interest rates and short-term repayment schedules were unaffordable options for securing a rainwater tank, irrigation systems, water pumps, or solar panels (S1, S3, S5, S8).

Renewable energy through microloans was also mentioned in the conversations with stakeholders. Currently, MFIs in Rwanda are offering energy microloans to buy equipment such as, for example, solar panels. Two barriers with these products were reported: a) farmer preferences - grid connections are considered higher status symbols compared to solar panels, and b) competition - there were reports by one stakeholder of cases where organizations had invested in renewable energy products in rural areas, only to have a grid connection arrive shortly after causing demotivation and default in loan repayments (S1). One stakeholder had extensive experience working with Mobisol, a Pay-As-You-Go off-the-grid solar company operating in Rwanda, and they spoke positively of the established structure of similar private companies.

“Who provide good services, good products and they come with microloans. So that’s a very, very good situation and so for us electricity projects are extremely easy as long as it...
off-grid. They are easy and quick.” (S5). However, they went on to explain that it was a very different situation when it came to establishing water systems or large-scale irrigation systems because these cannot be financed through microloans, and even microloans for small-scale irrigation and water tanks were set at very expensive interest rates.

Another innovative microfinance product mentioned was leasing microfinance. This product has the potential to ensure the access of farmers to larger scale productive equipment and mechanization processes that can increase productivity and adaptation (S2). It was reported that “Many other banks are interested in really coming up with this leasing finance kind of product, but we still have some market constraints in terms of regulatory, the regulatory environment is not conducive enough. The issues around taxation… so needs to be done so that the leasing can really go to another level […] we need to take it to a large scale.”

MFIs would likely require cooperatives or formalized group leasing arrangements in the communities to successfully provide smallholder farmers with access to expensive equipment, such as for example irrigation systems or post-harvest processing machinery, to increase the quantity of high-quality produce that can meet market standards. More generally, it was discussed that building livelihood resilience to climate change would require a joined-up approach to ensure that smallholder producers have affordable access to basic infrastructure, specifically connection to the electricity grid or decentralised solar energy, a clean water supply for the household, and sustainable irrigation water supply from rainwater or boreholes. MFIs could play a role in ensuring access to these basic services but there are clear limits to their products. This highlighted the need for an overarching community programme or partnership model between MFIs and other private, public and third sector stakeholders.

10.2.2. Policy environment

Most stakeholders thought that Rwanda had an enabling policy environment and well-established institutional structure which provided a secure foundation for companies and organisations interested in investing in long-term partnerships in climate micro-finance and development. Access to Finance Rwanda is working together with MINAGRI to update microfinance policies and strategies for financial inclusion in the agricultural sector with an emphasis on mainstreaming gender and youth inclusion, an area which was reported as weakly implemented in current practice (S2).

When asked about how climate resilience can be built into financial policies and programs, the importance of building supply side capacity and knowledge within the sector was emphasized. As one stakeholder engaged in high level policy development with the Government of Rwanda explained:

“We need to approach this from a market development system because if you try to build the capacity of the farmers in terms of climate resilience, I think the same needs to be done at the supply side of the market. I’m not sure how familiar all these microfinance, commercial banks, in terms of climate finance or green finance are, so we need to build the capacity so that these financial institutions and microfinance can become more cognizant… also support them in terms of coming up with tailor made climate finance products that can support farmers. So, we need to build the capacity on both the demand and the supply side, for green finance and climate finance for these financial institutions” (S2).

At the national level, Rwanda has made apparent commitments to new development programs that will encourage greater use of new digital technologies to increase real-time information sharing, financial inclusion, and access to basic services. Access to Finance Rwanda is working with MFIs in adopting their credit scoring models to the digitalisation trend of the sector. It is foreseen that microfinance will play a pivotal role in facilitating the access of farmers to digital credit platforms that can provide faster lending at lower interest rates (S2).

On the topic of current barriers for microfinance to facilitate climate resilience, the high cost of lending was highlighted:

“It think there is an issue of cost of lending, cost of lending is really high, and it needs a kind of policy action, farmers still complain about interest rate on agriculture loans very high. I know interest rate is determined by a number of factors; the risk is very high, but I think there is a need for stakeholders to come together to understand what the need is so that you can bring down the cost of lending. Even agriculture finance… if you look at the proportion of loans going to agriculture as compared to other loan portfolios it’s less than five percent. Yet it’s really a sector that we always say that it contributes to… agriculture is the backbone of the economy of the country, it contributes to the export revenues. Something needs to be done at the policy level to really make sure that this sector gets the finance, we need to increase financial equivalence for this particular sector. So the issue of cost of lending, interest rate, which is very high, it’s something critical that needs to be thought about” (S2).

10.3. Next Steps

10.3.1. Rethinking generic financing methods for adaptation and inclusion

Three key areas were mentioned by stakeholders that could potentially enhance the impact of microfinance on smallholder farmers’ resilience in Rwanda: (1) Support MFIs supplying agricultural microloans with capacity building on risk management and mitigation strategies; (2) Making agricultural microfinance more accessible and inclusive; and (3) Innovation in agricultural financial products and services.

Government investments, for example on irrigation or terrace-building programs currently sponsored through MINAGRI, were considered fundamental to de-risking the agricultural sector, and providing an environment where improved agricultural microfinance could flourish. In the opinion of one respondent, supporting risk management and mitigation strategies of MFIs when offering agricultural microfinance could foster innovation in the sector. In this sense, capacity building for MFIs was considered a pre-requisite to more accessible, affordable, and innovative agricultural microfinance products:

“So understanding the agricultural sector is one way of managing and mitigating the risk. […] Whatever we’re doing, if we don’t build the capacity of these institutions it’s going to fail (S2).” A better understanding of MFIs on, for example, agricultural supply chains or water management systems, will impact the sector in two fundamental ways: (1) improving product design, take-up and fostering innovation, and (2) contributing to improved risk assessment of the MFI clients by the MFIs, reducing the portfolio at risk and enabling a reduction of interest rates.

Improving accessibility of agricultural microfinance products was also mentioned as a key driver of enhancing impact. Stakeholders saw different avenues to achieve this:

- Considering and improving the gender balance in the leadership of groups being provided with microfinance products (S4). In the experience of Spark Microgrants, this inclusion strategy can lead to more equitable decisions on grant use (e.g. from energy to water management as women are traditional water carriers) and mobilise more women to join discussions and access loans.
- Exploring options for having public and third sector organisations (e.g. cooperatives or NGOs) as loan guarantors. The MFI EjoHeza has developed a model using cooperatives as guarantors even if farmers are not members of the cooperative (S1). NGOs, such as CARE International with graduation programmes could also partner with MFIs to guarantee the microloans of non-members of the cooperative (S1).
- Aiming for collateral-free microloan solutions is key to improve accessibility and impact (S2). Social capital and group lending have been the traditional way of achieving this. However, an option mentioned was the ‘warehouses system’ where farmers can bring produce together and...
Climate Resilience Through Microfinance

11. DISCUSSION AND RECOMMENDATIONS

11.1. Discussion

Climate change poses a risk to smallholders and thus to the financial institutions that deliver services to this group, notably microfinance. This presents a clear financial motivation for MFIs to engage in increasing climate resilience among their clients, in addition to social motivations to do so (Bastiaensen et al. 2019).

It is clear that Rwandan smallholders are already suffering the impacts of climate change and that their productivity is affected, at times severely. Many have undertaken mitigating measures in their farming methods, such as water management, tree planting, changes to planting dates, pests and disease control, but most of these measures require finance, to which access is unevenly distributed.

This report sought to make recommendations relating to microfinance to enable optimisation of the microfinance environment and microfinance products, policies and processes towards greater climate resilience and greater inclusivity, with a specific focus on Urwevo Bank in Rwanda.

The current microfinance products available to farmers are primarily aimed at increasing yield, in line with the Government of Rwanda’s CIP. The CIP aims for greater commercialisation of farming, thus increasing GDP. The CIP programme is mainly implemented through land consolidation (e.g. through cooperative farming), the use of increased agricultural inputs, and irrigation, and also increases included access to financial and extension services.

The CIP has been critiqued for several reasons. The transition to commercial agriculture has rendered some smallholder farmers more resilient to climate change, but this may also lead to increased social stratification (Helwig et al. 2020; Clay and King, 2018), as some are wholly or partially excluded from benefits of increased productivity, age, or gender. Cioffo et al. (2016) question whether increased inputs do indeed lead to improved living conditions for smallholders, and instead suggests that increased commodification, when accompanied by reduced state support, can increase inequality. Furthermore, the commercialisation of agriculture has led to a reduction of certain crops (cassava, sweet potato, ciraza and sorghum) that are not part of CIP as they are considered less profitable; these crops are however considered flood and drought tolerant (Clay and King, 2018) and thus lower risk in a changing climate. Commercial agriculture also requires capital, access to which is unevenly distributed according to socio-economic factors. As highlighted in our previous report (Helwig et al. 2020), any strategy that promotes increased fertiliser and pesticide use can have impacts on quality of the soil and the local water resource (see also Cantore, 2011, who also highlights hidden health costs of pesticide use in Sub-Saharan Africa), especially when the latter is directly used for drinking water.

The language used in the CIP programme is strongly normative, with ‘modern’ pitched against ‘traditional’ or ‘ancient’, which can be contrasted with a wider global interest in traditional and local productive methods, which are often sustainable or regenerative.

The Rwandan Ministry of Environment (2018), in its latest national communication to the UNFCCC, proposes numerous adaptations that would increase resilience for smallholder farmers. These include (amongst others) broadcast weather forecasts and sowing date recommendations, precise fertiliser use (responding to soil properties) and recommendations that enable this, planning for crop change, adapted varieties, environmentally friendly fertilisers, expansion of rainwater harvesting technologies at community level (rather than household level), regular maintenance of rural roads and irrigation channels, drip irrigation to build in future resilience to water scarcity, technologies to offset the risks of agricultural production, rotation cropping (multi-cropping), earlier deliveries of fertilisers, and use of ‘multi-purpose’ indigenous fruit trees (Republic of Rwanda 2018a). Through more sustainable and smarter use of inputs, measures proposed by the Ministry for the Environment are likely to enhance climate resilience whilst reducing some of the social and environmental risks associated with increasing environmental inputs.

Microfinance is not designed to support the very poorest in society and loans are not available to this group as they would not be able to pay them back. Any adaptation strategy that proposes an important role for loans therefore risks increasing inequality. The recommendations below aim towards a reduction of both climate risks and financial risk more generally, but also towards the use of new techniques to removing barriers and improving access to finance, which, it is hoped, will mitigate this undesirable societal effect. Nevertheless, the report identified that some farmers and vendors are reluctant to enter into debt with very good reason. Therefore, microfinance loans should always be part of a much wider package of support measures that addresses vulnerability to climate change and, while we have sought to explore how microfinance can increase access to adaptation measures to climate change, longer term monitoring will be required to gauge the impact on social and community structures.

Nevertheless, the recommendations proposed below, based on our survey data, farmer interviews, stakeholder interviews and review of some of the policies of the Government of Rwanda, can be seen as a redirecting of microfinance from agricultural inputs only towards a broader range of climate adaptations, whilst also optimising policies and processes to remove or reduce barriers to access finance.

11.2. Recommendations

The recommendations below highlight in particular those areas where farmers’ and stakeholders’ views converged.
11.2.1. For MFIs: New products:
1. To consider providing tree and possibly grass loans as a new MF product. Repayment schedules should take account of the fact that (fruit) trees are not productive in the first few years. Access and uptake of such loans should be carefully monitored and consideration should be given to mitigating financial risks for both farmers and MFIs if trees do not survive, e.g. due to climate impacts.
2. To consider providing longer-term loan equipment loans and/or loans in the form of equipment lease. This could include smaller water management equipment as well as other agricultural equipment.
3. To consider providing cash loans, to empower farmers to build adaptive capacity suited to their needs.
4. To consider bundling climate-adaptive products, such as insurance or trees, with discounts on other products (see for example Bulle et al. 2019) - although further research is needed to understand the full impact of such measures on farmers’ sovereignty.

Loan conditions and processes:
5. To develop a policy on flexibility where clients have suffered adverse weather; this appears to happen on an ad-hoc basis already but formalisation would give clients greater certainty.
6. To consider whether collateral-free loans can be provided, for example through the ‘warehouse system’ or through schemes enabling public or third sector bodies to act as guarantors.
7. To work with the Government on de-risking agriculture with a view to reducing interest rates.
8. To significantly reduce loan application and disbursement times.

Training and consultancy:
9. To include the following into its training programmes for clients:
   a. To build capacity and knowledge among farmers on climate change and climate adaptation for agriculture.
   b. To encourage farmers to explore and draw on traditional expertise and local knowledge in coping with drought, in particular by foregrounding women as traditional water managers.
   c. To instruct farmers in the use of simple, cheap technologies and practices, including for climate-resilient storage solutions.
   d. To improve financial training on insurance and variable interest rates, which caused confusion.
10. To consider whether training or training materials can be made available to non-clients.
11. To increase the availability of agronomists and ensure these have the necessary expertise to advise on climate-related matters.

12. To build capacity and knowledge within the institutions on green finance and climate adaptation, in particular amongst those directly involved with farmers such as agronomists and agricultural loan officers.

Insurance:
13. To ensure insurance partners are inclusive of those most at risk (unless these are subject to government relocation programmes).
14. To review insurance policies available to clients and to include an option for harvest insurance rather than just To be clear and transparent about crop or loan insurance when farmers take out a loan.

Financial inclusion:
15. To pursue further financial inclusion, for example through digital banking services that work for those relying on borrowed mobile phones. This could include partnering with existing mobile money providers and/or fintech companies.
16. To develop partnerships in order to improve access to credit via public or private ‘graduation programmes’.

Partnerships and finance:
17. To position themselves to occupy a niche in distributing climate finance and green investment to smallholder farmers at the frontline of climate change.
18. To develop partnerships with the public and third sector in particular, as indicated throughout this report and in the recommendations above.

11.2.2. For agricultural cooperatives:
1. To support prospective members in their progression from being financially vulnerable to being full members of the cooperative.
2. To ‘mobilise’ among their membership on climate adaptation: raise awareness of risks and mitigation and garner support for collective action, such as larger investments.
3. To ensure fast and effective communication channels for disseminating information to their membership.
4. To consider offering initial support to prospective members, for example by longer repayment periods for initial plots or joining fees.
5. To put in place policies that protect members from liability in case of mismanagement by office holders.
6. To continue organising ‘community works’ to mitigate and adapt to climate change impacts.
7. To empower women to fully take part in decision-making processes, in particular on water management.
8. To consider impacts of water management on all water users, including those remote from the resource and those who are not members of the cooperative.
9. To engage in knowledge sharing with non-members where possible.
10. To procure digital systems that allow access to digital finance for all members.

11.2.3. For the Government of Rwanda and its departments and agencies:
Adaptation support for smallholders:
1. To acknowledge the (economically important) agricultural sector and specifically smallholder farmers as being at the frontline of climate change and in urgent need of support.
2. To consider acting as guarantor for smallholder farmers, which would reduce risks for MFIs and thus enable a reduction in interest rates.
3. To fully assess weather and climate risks for the agricultural sector and to coordinate the de-risking of the sector, for example through government-supported irrigation and terracing.
4. To ensure that the many subsistence farmers for whom microfinance products are not accessible are protected from the direct and indirect impacts of climate change.
5. To consider whether collaboration between MINECOFIN and the Ministry of Environment can be strengthened in order to mobilise microfinance for Green Growth and Climate Resilience, in a similar way to which it has supported MINAGRI’s CIP.
6. To build capacity and knowledge on climate change within all of its departments, including MINICOM and MINECOFIN.
7. To facilitate communication of meteorological forecasts and weather events (including weather warnings) to farmers, with attention for the accessibility of these communications.

Financial inclusion:
8. To support MFIs in providing the services highlighted above.
9. To negotiate reductions in interest rates with the MFIs.
10. To consider an interest drawback facility, similar to for example the Nigerian model, to offset interest rates to fiscal institutions lending to particularly vulnerable borrowers. These mechanisms can boost financial inclusion and increase participation in sustainable farming practices by reducing the risk of financial institutions when investing in the agricultural sector (CBN, 2005).
11. To expand the Business Development or similar schemes to provide collateral for those who do not have any, in particular for women and youths, and to ensure this is available in rural areas.

Environmental sustainability and health:
12. To ensure, through regulation, that ‘downstream’ users of water resources are not adversely impacted by upstream water abstractions or pollutant inputs.
13. To review current agricultural policies and ensure these are fully cognisant of climate projections, with particular attention to impacts on vulnerable populations.
14. To ensure that domestic water needs are prioritised over commercial water needs.
15. To plan and make public strategies for both electrification and drinking water supply, with indications of where these are likely to remain decentralised.

Partnerships are seen as a vital component of progress towards climate resilience. Potential partners include meteorological services, NGOs who may be able to act as loan guarantors for those not in cooperatives, fintech companies and/or mobile banking providers, NGOs who may be able to part-subsidise larger infrastructure projects such as water management systems, private companies developing machine technology that mitigate risk and improve agricultural yield of smallholder farmers, and Higher Education institutions who may be able to contribute to knowledge and capacity building.
APPENDIX I – TOPIC GUIDE RURAL DISTRICTS

Guiding question 1: What are the climate vulnerabilities experienced by individuals and communities in rural Rwanda, how might these change in the future and how can these vulnerabilities be addressed or mitigated?

a. How has your life changed because of the weather over the last 5 years? Have you or your family been impacted in terms of food security, housing, migration to other places, or any other way?

b. What have you and other community members been doing to adjust to the weather changes? Did it work? Why, why not? Are you planning on implementing any in the near future?

c. What impact have these changes had on you and your family? [Any examples?]

d. What do you think the climate will be like five years from now? What kind of concerns do you have?

e. What kind of support do you need to prepare for these changes? Is it from the government, from banks, from friends and family, or someone else?

Guiding question 2: How can microfinance products and training be tailored to better respond to farmers and other (potential) clients’ needs whilst safeguarding local environmental quality?

a. Can you tell me about the good and the bad things about taking a loan? How does taking a loan help with farming?

b. Who in the household makes the decision to take a loan, and why? Once the loan is disbursed, who has control over the loan? [I+S]

c. If given a loan of 200,000 RWF [$200] in the next season, what would you spend it on?

d. What are the non-financial products you have received or are the hardest to get?

e. Do you have any ideas for other kinds of financial products that may help you?

Guiding question 3: In particular, what services can be offered to benefit those who are at risk of being excluded from Agricultural Cooperative, VSLAs and SACCOs, or face other societal barriers (to be defined) for accessing finance?

a. What are the requirements to join a cooperative or a savings group?

b. Let’s talk for a little bit about those who cannot join cooperatives, savings groups or SACCOs. Why can’t they join? Do you think they should still have access to loans in that case? Why/Why not?

c. Which loan/financial product requirements make it difficult for people to get them? How do you think this could be changed?

d. Can you think of any other ways in which we could increase the possibility of these people to access loans/financial product?

APPENDIX II – TABULATED DATA RURAL DISTRICTS

Available on request in Excel.

APPENDIX III – TOPIC GUIDE KIGALI

Guiding question 1: To what extent are SMEs in the urban food supply chain, and thus urban food security, affected by climate change impacts on farming or on transport systems?

a. How long have you been selling fruits/vegetables to earn a living?

b. Where do you usually get your produce from?

c. Can you talk me through the process of getting the produce from the farm to the market?

d. Over the 5 years, has it become easier or more difficult to procure sufficient amounts of produce?

e. How about its quality? Has it changed, at all?

f. [If procuring produce has become more difficult] Why do you think it’s become more difficult to procure produce?
g. Do you think that weather changes have had a role in this? If so, how?

h. Was your supply ever affected by droughts, floods or other weather problems?

i. Does extreme weather affect the transport of produce to the market? How?

j. Is your food business affected in any other way by extreme weather?

k. What do all these issues mean for your customers?

l. What has the impact of these problems been on prices, specifically?

m. And on the range of food available, and customer choice?

n. What impact have these changes had on you and your family? [Any examples?]

o. Do you see any possible solutions to these issues?

Guiding question 2: How can MF products and services be optimised to provide resilience?

p. Have you ever used a loan to support your business? If so, can you tell me more about it (how much it was, what you spent it on, whether you repaid it successfully)?

a. [If they weren’t able to repay it] Why weren’t you able to repay it?

b. [If they haven’t taken a loan yet] Why haven’t you taken out a loan yet?

c. [If they are not eligible] If you’re not eligible, why is that?

q. Can you tell me about the good and the bad things about taking a loan?

r. How does taking a loan help with your business?

s. If given a business loan of 200,000 RWF [$200], what would you spend it on?

r. Do you have any ideas for financial products other than loans that may help your business?

u. Apart from financial products, how else could small loan providers assist you in your business (training, connections, communications, other ways)?

APPENDIX IV – TABULATED DATA KIGALI

Available on request in Excel.