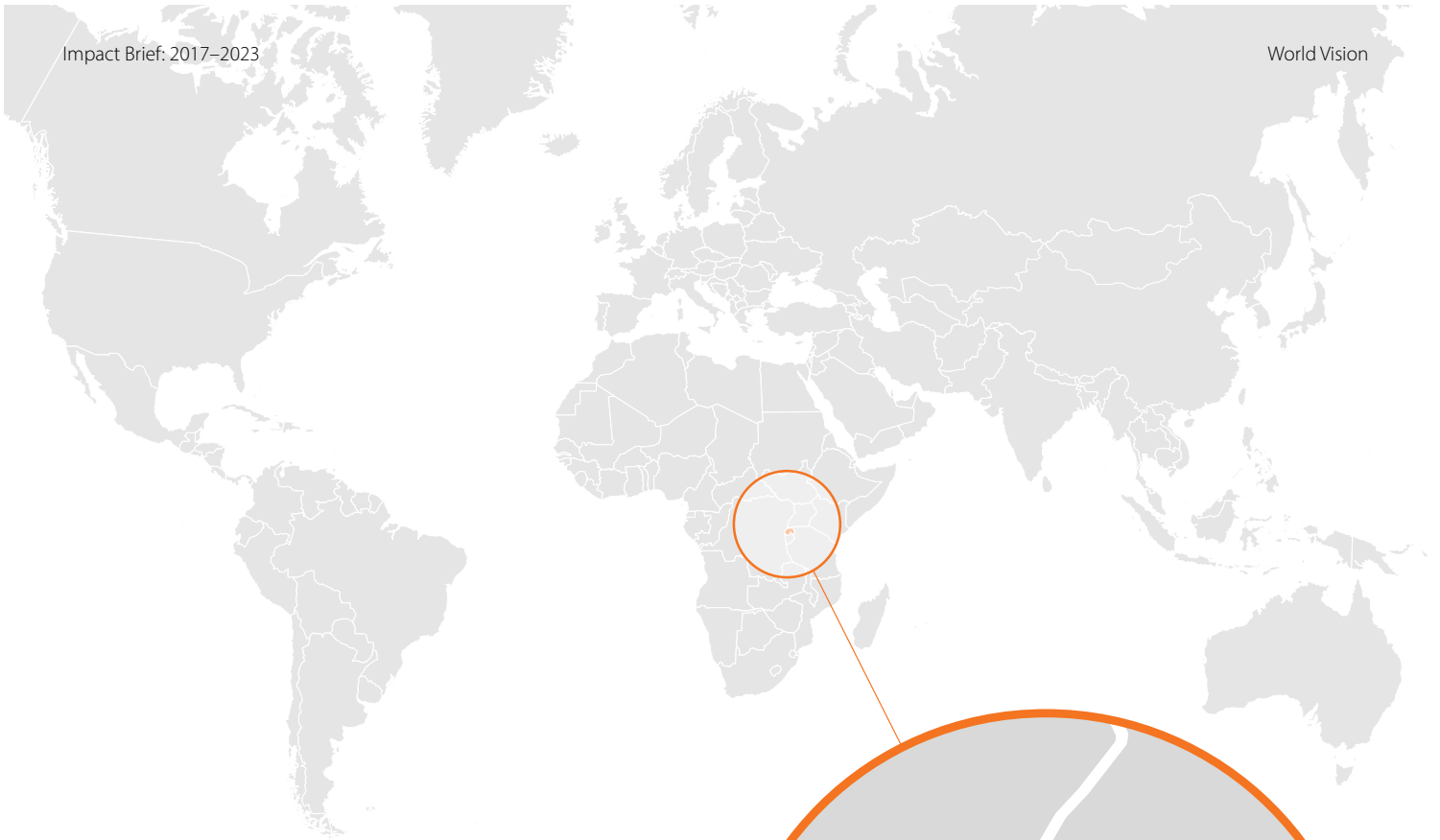World Vision®

FOREST LANDSCAPE RESTORATION FOR IMPROVED LIVELIHOODS (FLR)

Rwanda | Impact Brief
(2017–2023)

THIS MEANS **THE WORLD**

About this report

This brief summarises the main findings of the final evaluation of the Forest Landscape Restoration (FLR) for Improved Livelihoods project in Rwanda implemented by World Vision Rwanda (2017-2023). The evaluation was completed by Research Moguls® Ltd in 2023. Additional data analysis was completed by Nami Kurimoto and Tamam Noor from World Vision Australia (WVA). For more information, contact Alana Daweleby, WVA Country Impact Officer for Rwanda (alana.daweleby@worldvision.com.au), Nami Kurimoto, WVA Evidence Building Advisor (nami.kurimoto@worldvision.com.au) or Tamam Noor, WVA Economic Empowerment Manager (tamam.noor@worldvision.com.au). The FLR project was supported by the Australian Government through the Australian NGO Cooperation Program (ANCP).

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Front cover photo: In Gatsibo District, FMNR techniques are helping Camile provide sufficient fodder for his cows.

RWANDA

EXECUTIVE SUMMARY

FOREST LANDSCAPE RESTORATION FOR IMPROVED LIVELIHOODS IN RWANDA (FLR)

Supported by the Australian Government through the Australian NGO Cooperation Program (ANCP)

Duration	**6 years** from July 2017 to June 2023
Budget (US$):	**US$2,470,845**
Estimated number of participants	**13,158 direct participants** made up of 11,808 smallholder farmers and/or cattle keepers plus 1,350 students

Rwandan farmers and their families are heavily reliant on the country's limited land resources, forcing farmers to convert forestland into farming land. Rwanda's forests are being depleted, causing soil erosion and a loss of biodiversity. Consequently, there is an alarming decline in crop and livestock productivity, leading to food insecurity and malnutrition.

To help address these challenges, the Forest Landscape Restoration (FLR) for Improved Livelihoods project was launched by World Vision Rwanda in 2017. FLR was designed to improve food security and nutrition, and increase incomes amongst smallholder farmers in the Bugesera, Gatsibo, Kayonza and Nyagatare Districts of Rwanda's Eastern Province. The project aimed to reach at least 11,808 households hosting a population of 51,955 people across these four districts by 2023.

An independent evaluation of the FLR project, conducted in its final year, highlighted many significant project achievements including the following:

ENVIRONMENTAL RESTORATION

- Median tree density (trees/ha) rose by 250% in project areas and dropped by 49% for comparison areas.

- Total number of trees recorded in the project areas increased by 822% since 2018 and 45% in comparison areas.

- Tree planting was identified by participants as the main contributor to reduced soil erosion.

FOOD SECURITY AND NUTRITION

- The proportion of households with year-round access to sufficient food to meet their families' needs increased from 26% to 38%.

- Households who practiced FLR had greater food diversity (63%) than those who did not (50%).

- The prevalence of severe hunger dropped by 38% in the project areas. It increased by 20% in the comparison group.[1]

ECONOMIC ADVANCEMENT, EMPOWERMENT AND INCLUSION

- By 2023, all participants were practicing at least one sustainable agricultural technique. These participants were more than twice as likely to report an increase in crop production in the past five years than the comparison group (46% versus 19%, respectively).

- Approximately four times as many households reported earnings from trees and/or tree products (7% to 27%) in project areas, while only a marginal increase was reported in comparison areas (7% to 10%).

- 34% of households reporting increased income were female-headed households and 40% were households with one or more people with disability.

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1   Differences in data collection months between baseline (March-April) and endline (January-February) may have seasonal impact on these results. Given dry/hunger season in Rwanda's Eastern Province is during November/December, any potential seasonal effect would have disfavoured endline results.

Gilbert, an FLR project participant, is mulching his avocado trees to retain moisture and improve soil structure.

CONTEXT

With a population density of 533 people per kilometre, Rwanda is among the most densely populated countries in the world.[2]

Notable progress has been made in reducing poverty over the past two decades, but a significant portion of the Rwandan population continues to face economic challenges.[3] Most of the population is heavily reliant on natural resources such as land, water, crops and livestock for their livelihoods. This dependence on limited land resources has forced farmers to convert forestland into farming land. Global Forest Watch reports that Rwanda lost 43,100 ha of tree cover – a loss of almost 9% – in the 20-year period to 2022.

The resulting deforestation, soil erosion and loss of biodiversity has contributed to a decline in crop and livestock productivity. For Rwandan families, this has meant increased food insecurity and malnutrition, both of which can quickly become life-threatening for their children. Although food security has slightly improved in the past five years, Rwanda still ranks high in malnutrition prevalence, with the Global Hunger Index placing it 102nd out of 132 countries.[4]

To address these challenges, Rwanda implemented a Forestry Policy in 2004 with the aim of ensuring sustainable forest management and maintaining forest coverage of 30%. This target was reached by 2017, but the limited availability of alternative heat and lighting energy sources in the country poses a threat to this achievement. Nearly half the population lacks access to electricity and is almost completely reliant on wood or charcoal as fuel for cooking. This contributes to illegal deforestation and uneven distribution of tree resources, among other negative impacts on forest cover. Additionally, 40.7% of Rwandan houses are constructed using timber, further exacerbating the demand for forest tree products.[5]

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2   World Bank (2020), Population Density (people per sqaure km of land area) – Rwanda.
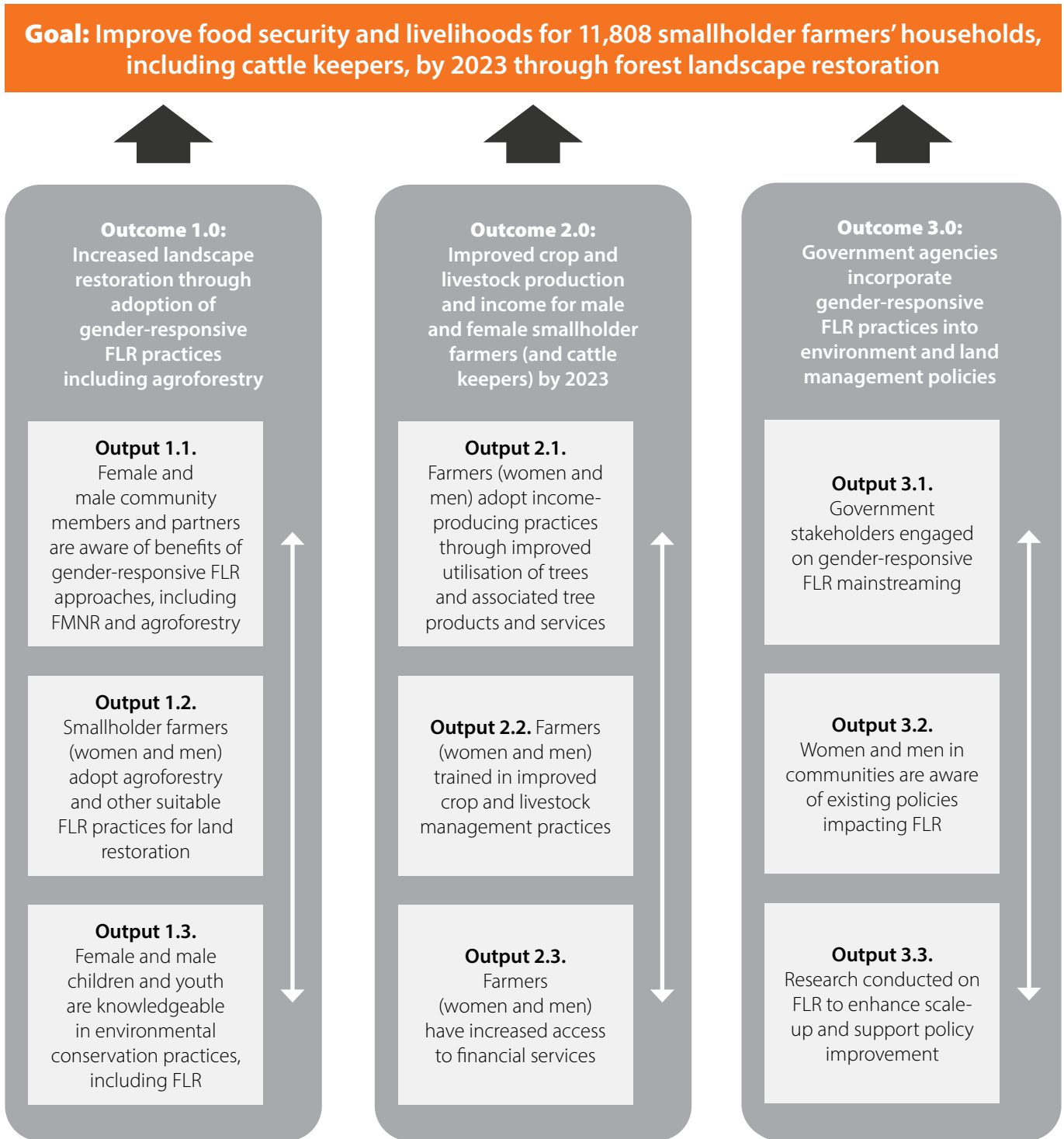3   National Institute of Statistics of Rwanda (2018), Rwanda Poverty Profile Report, 2016/17.
4   Global Hunger Index (2022) – Rwanda.
5   National Institute of Statistics of Rwanda (2018), The Fifth Integrated Household Living Conditions Survey, EICV5.

PROJECT OVERVIEW

World Vision Rwanda launched the FLR Project in 2017 as part of its efforts to help address the looming challenges to the local environment, food security and livelihoods. The project was implemented in the Bugesera, Gatsibo, Kayonza and Nyagatare Districts of the Eastern Province – the nation's province at highest risk of drought. FLR interventions aimed to reach at least 11,808 households hosting a population of 51,955 people across these four districts by 2023.

Table 1: FLR project goal and technical approaches

Goal: Improve food security and livelihoods for 11,808 smallholder farmers' households, including cattle keepers, by 2023 through forest landscape restoration

Outcome 1.0:
Increased landscape restoration through adoption of gender-responsive FLR practices including agroforestry

Output 1.1. Female and male community members and partners are aware of benefits of gender-responsive FLR approaches, including FMNR and agroforestry

Output 1.2. Smallholder farmers (women and men) adopt agroforestry and other suitable FLR practices for land restoration

Output 1.3. Female and male children and youth are knowledgeable in environmental conservation practices, including FLR

Outcome 2.0:
Improved crop and livestock production and income for male and female smallholder farmers (and cattle keepers) by 2023

Output 2.1. Farmers (women and men) adopt income-producing practices through improved utilisation of trees and associated tree products and services

Output 2.2. Farmers (women and men) trained in improved crop and livestock management practices

Output 2.3. Farmers (women and men) have increased access to financial services

Outcome 3.0:
Government agencies incorporate gender-responsive FLR practices into environment and land management policies

Output 3.1. Government stakeholders engaged on gender-responsive FLR mainstreaming

Output 3.2. Women and men in communities are aware of existing policies impacting FLR

Output 3.3. Research conducted on FLR to enhance scale-up and support policy improvement

PROJECT TECHNICAL APPROACHES

OUTCOME 1:

Increased landscape restoration through adoption of gender-responsive FLR practices including agroforestry

Targeting male and female smallholder farmers, this outcome focused on improvements in land restoration through increased awareness and adoption of agroforestry and other environmentally sound practices. The interventions undertaken targeted community members to help them understand the long-term benefits of landscape restoration on commercial agricultural production and livestock management. This outcome also integrates Farmer Managed Natural Regeneration (FMNR) and agroforestry with gender-inclusive business models of economic development.

OUTCOME 2:

Improved crop and livestock production and income for male and female smallholder farmers (and cattle keepers) by 2023

The project used a two-pronged approach to address Outcome 2. Firstly, crop and livestock production practices that were economically beneficial and environmentally restorative were introduced, such as the distribution of trees and planting materials. Secondly, sustainable sources of tree planting materials were made easily accessible to the community through nursery cooperatives.

OUTCOME 3:

Government agencies incorporate gender-responsive FLR practices into environment and land management policies

The project worked with government agencies advocating for gender-responsive practices that are beneficial for livelihoods and the environment. Leveraging the Rwandan government's agenda of reforestation, the project worked collaboratively with government agencies. Evidence and project lessons were highlighted to influence environment and land management policies that would ensure a sustainable method for landscape restoration.

EVALUATION OVERVIEW

PURPOSE

An independent evaluation was undertaken in the project's final year. Its purpose was to examine the project's impact on the target communities and provide specific and actionable recommendations for the scaling-up and sustained adoption of FLR practices. Additionally, the evaluation assessed the influence of the project on food security and incomes among target households, as well as the spill over of adoption beyond areas of operation, to contribute to World Vision's design and implementation of future environmental, livelihood and resilience projects.

METHODOLOGY

The evaluation used a quasi-experimental design using mixed methods. Qualitative data included case studies; key informant interviews (KIIs) with staff, partners, head teachers and community members; focus group discussions (FGDs) with project participants; and observations. Quantitative data included a household survey administered to 2,013 households (1,611 from the intervention group and 402 from the comparison group). Both the baseline and endline comparison groups were selected from geographical cells where the project was not implemented. The evaluation was also informed by the project's baseline information to measure and examine key changes over the course of the project's life.

LIMITATIONS

Some participants shared FLR practice-related knowledge and skills with community members beyond the project's areas of operation, including people in the comparison group. To address this, the household survey asked participants about their practice of FLR so that accurate comparisons could be made between those who indicated they did or did not practice FLR, rather than just by their 'comparison' or 'intervention' status.

Secondly, differences in data collection months between baseline (March-April) and endline (January-February) may have seasonal impact on these results due to different seasonality. Given dry/hunger season in Rwanda's Eastern Province is during November/December, any potential seasonal effect would have disfavoured endline results. Finally, the project could not control for government environment and land management policies being implemented in our comparison areas, and thus some indicators found that comparison group members also experienced a degree of benefit and impact, though not to the same extent as those in project areas.

Community farming hubs are equipping women like Diana with income-generation skills and locally-grown seedlings.

FINDINGS

Goal: To improve food security and livelihoods for 11,808 smallholder farmers' households (including cattle keepers) in 16 Sectors of Bugesera, Gatsibo, Kayonza and Nyagatare Districts of Rwanda by 2023 through Forest Landscape Restoration.

The evaluation found that the project made significant strides in enhancing food security and boosting incomes among the intended smallholder farmers. FLR's contribution to improving food security was evident as 38% of households reported having consistent access to an adequate food supply for their family's requirements at the project's conclusion, compared to 26% at the project's baseline.

The project's activities were vital in achieving the overall goal by improving smallholder farmers' livelihoods and economic well-being. Fifty-seven percent of the intervention group participants reported a significant income increase over the past six years, surpassing the 32% observed in the comparison group. Households in the comparison group explained how the compounding effects of increased drought, pests and diseases affected their crop productivity in recent years. Meanwhile, their financial well-being has been deeply impacted by the effects of the COVID-19 pandemic and rising living costs. Conversely, in the project areas, households shared reasons for increased incomes: diversified productivity through selling seedlings and tree products; almost year-round availability of fodder for livestock after planting short-term fodder trees; and reduced household expenditure on firewood due to the fodder trees.

The project also played a role in building households' financial resilience. Sixty-six percent of participants expressed confidence in mobilising 40,000 Rwandan francs (US$34) within 30 days during emergencies, in contrast to the 46% observed in the comparison group. Financial resilience was a key factor positively associated with food security. Notably, 67% of financially resilient households demonstrated sufficient dietary diversity, while only 48% of non-resilient households achieved the same level.

These accomplishments collectively worked towards the goal of enhancing the well-being of children. Additionally, active involvement in Savings for Transformations (S4T) groups, and the resulting improved access to finance, supported a rise in children's enrolment in schools due to the ability to pay school fees on time.

"Before joining the savings group, it was difficult to send my children to school and I rarely bought them new school uniforms. But since I joined the group, whenever it's time to pay school fees and I have not yet harvested my crops, I borrow from the group and send my children to school with clean uniforms, and I'm able to refund after the harvest season."

– Female S4T group member from Gatsibo District

Table 2: Progress by goal indicators

Key Indicators	Baseline 2018 (N=1,657)	Endline 2023 (N=1,611)	Expected Change
Proportion of households with year-round access to sufficient food for the family's needs	26	38	↑
Number of months of food shortages during last year	5.0	4.4	↓
Proportion of households with severe household hunger during last four weeks	9	6	↓
Proportion of households with sufficient diet diversity	24	61	↑
Proportion of households repurchasing staple food	51	85	↑
Proportion of households reporting an increased income over last six years	31	56	↑
Average annual household income	RF100,000 – On-farm RF50,000 – Off-farm	RF180,000 – On-farm RF180,000 – Off-farm	↑ ↑
Area Poverty Rate (PPI Score card)	29	28	↓

For Diogene's (right) children, adopting land restoration practices means the family now confidently affords school fees.

FINDINGS BY OUTCOME

OUTCOME 1:

Increased landscape restoration through adoption of gender-responsive FLR practices including agroforestry.

The evaluation revealed that lead farmers significantly contributed to the implementation of the project. Seventy-two percent of households confirmed receiving support from lead farmers to enhance their livelihood knowledge, and 56% directly participated in the project trainings conducted by lead farmers. This lead farmer approach contributed to a higher adoption (92%) of FLR practices, especially tree planting around homes (76%) and crop fields (69%).

Adoption of sustainable agricultural techniques by participants was very high. All target households reported practicing one or more of the techniques such as use of organic manure, mulching, planting cover crops, crop rotation, planting drought tolerant tree species and/or erosion control with live barriers.

FLR practice was a significant factor positively associated with sufficient diet diversity in the household. Among households that adopted FLR practices, 63% consumed four or more different types of foods (out of 10) the day before the survey, compared to 50% of households who did not practice FLR. The evaluation noted that there is still a need for longer-term livelihood programming as 60% of adopters and 77% of non-adopters still experience food insecurity.

The FLR practices contributed to reduced soil erosion and increased soil fertility, both of which were associated with improved diet diversity. Over the project life, the proportion of intervention group participants who reported reduced soil erosion on their farmlands (in the past five years) increased from 17% to 84% (see Table 3). Correspondingly, 52% of intervention group participants reported improved observed soil fertility on their farmland, while only 25% of comparison group members reported the same. The link between soil fertility and diet diversity was evident as 64% of the households reporting increases in soil fertility also had sufficient dietary diversity, compared to 55% of those reporting a decrease.

"Since I joined the project, I planted fodder trees around my farm. This has helped me during the dry season as I was still able to get fodder for my cows and milk them. The lead farmer also helped us make a kitchen garden which continued to give us green vegetables when prices peaked."

– Farmer from the Gatsibo District

Gilbert is feeding his cow caliandra leaves. His trees are helping to feed livestock plus boosting nitrogen in the soil.

Table 3: Progress by key indicators under Outcome 1

Key indicators[6]	Baseline 2018 (N=1,657)	Endline 2023 (N=1,611)
Proportion of households who observe that soil fertility has improved	57	52
Proportion of households who observe that soil erosion has reduced	17	84
Proportion of households practicing climate smart and FLR practices	85	100
Hectares of land managed with FLR	0 ha	747.2 ha

6   To qualify soil erosion and fertility indicators, participants were asked about their observed changes over the past five years (both at baseline and endline). Objective measures of soil quality were not used.

OUTCOME 2:

Improved crop and livestock production and income for male and female smallholder farmers (and cattle keepers).

Agricultural training provided through the project increased farmers' knowledge and prompted a change in behaviour, as observed by their increased adoption of FLR practices and their rising interest in developing income-generating activities. A rise in crop production was clear: 46% of targeted households reported increased crop production during the last five years, against 25% at baseline.[7] In addition to crops, 27% of target households (compared to 7% at baseline) increased their earnings from trees and tree products during the last 12 months over the project life (see Table 4).

The project also provided business and technical skills to the 22 nursery cooperatives. The nurseries then provided farmers with easy access to seedlings and planting materials. Despite the challenges brought about by COVID-19 and recent drought, the nurseries were able to produce 5,938,429 seedlings. This was enough to meet the project's demand and sell approximately 79 million Rwandan francs (US$70,000) worth of seedlings to outside buyers during the last three years of the project.

"Just look out the window here. Six years ago, this area was referred to as 'sahara' because it was constantly dry. But because of the trees we planted from the group nurseries, we now produce more beans than ever."

– Male Cell Leader, Nyagatare

Table 4: Progress by key indicators under Outcome 2

Key indicators	Baseline 2018 (N=1,657)	Endline 2023 (N=1,611)
Proportion of households reporting increase in own crop production in the past five years	25	46
Proportion of households reporting increase in own livestock production in the past five years[8]	18	37
Proportion of households reporting increased earnings from trees and or tree products in the past five years	7	27

OUTCOME 3:

Government agencies incorporate gender-responsive FLR practices into environment and land management policies.

The evaluation identified that the FLR project has supported the tree planting efforts of the local government. Notably, some of the lead farmers' achievements were included in district performance reports. Local government officials recognised the FLR project activities as being the most significant contributor to their own tree planting campaigns. Although the window for an opportunity was noted, the project had limited engagement at the policy level with the Ministry of Environment (MoE) or Rwanda Environment Management Authority (REMA). There is an opportunity here for World Vision Rwanda to further engage with the government on the relevant policy and program strategies.

"As a district, we have annual targets that aim to meet the government's targets around climate change mitigation and adaptation. We have recognised World Vision as one of the most important partners because of their work in not only providing trees but also educating farmers on climate resilience practices."

– Sector Agronomist, Rukara Sector

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7   Participants who reported increased crop production at baseline attributed this to the Government's Crop Intensification Program (CIP) that included subsidies such as improved seed and inorganic fertilisers.
8   Participants were asked about the state of crop and livestock productivity in the past five years both at baseline and endline.

SUSTAINABILITY

The evaluation found that the project built the technical capacities of farmers in good agricultural and livestock production practices as well as their financial literacy.

In addition to the realised impacts of FLR, the project facilitated and motivated lead farmers to continue their activities through the provision of water tanks and farming tools. For farmers who participated in the project in its early years, or who continued to work with World Vision Rwanda after the FMNR project,[9] the benefits of practices like tree planting to their productivity and income were clear. There is a high likelihood of these farmers continuing their efforts, and sharing their knowledge with others, so long as they remain profitable.

> *"So many projects before this came and then went away. There was no ownership and the trees wouldn't survive. When we got this training, that helped. We've doubled the level of tree coverage in each household compared to before. Families can feed their children fruits and reduce disease."*
>
> – Male lead farmer, Nyagatare District

Farmers who only begun participating in the project during the last two years may not yet have realised the far-reaching and profitable benefits of their efforts, which are key motivators of continued practice. To address this, many of these farmers have been connected to new organisations and projects to continue developing local value chains and learn how to commercialise their produce.

The sustainability of the nursery cooperatives remains inconclusive because of insufficient evidence on detailed cost analysis. The continued market distortion of free tree seedlings distributed by the government and other NGOs remains a challenge to sustainability in its perpetuation of the community's reliance on free seedlings.

GENDER

World Vision International (WVI) and World Vision Australia (WVA) use the Women's Economic Empower (WEE) approach to measure gender inclusion through four domains: economic advancement, access, agency and equitable systems. Regarding the domains of women's economic advancement and access, the evaluation revealed that the FLR project has provided equal opportunities for women and men to participate in nursery cooperatives and Saving for Transformation (S4T) groups as well as to serve as lead farmers in their communities. There were also female-only cooperatives to encourage women to participate.

Regarding the equitable systems domain, the project rolled out Gender Inclusive Financial Literacy Training (GIFT) to train couples on equitable gender relationships at the household and community levels both in domestic and economic spheres.

In terms of agency, a higher proportion of households who participated in project activities reported joint decision making about productivity (i.e. financial decision making in the household) than the comparison groups. As an example, 44% of project intervention households reported jointly deciding upon the division of labour compared to 33% in the comparison group. However, when it came to making decisions on children's education and health expenses, there were no significant differences between the groups. Further gender analyses are recommended to more deeply explore the factors that influence equal decision making.

> *"When we come together, I feel social and love being among everyone. I feel strong and happy. When I tell my children and husband I'm meeting other group members, they are happy because they know this has a positive impact in their home."*
>
> – Member of the Female Farmer Cooperative, Nyagatare District

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9   Reversing Land Degradation in Africa through Scaling-Up Evergreen Agriculture 2017-2023, European Union.

DISABILITY

The evaluation identified some cases where people with disabilities were provided with additional support to access fruit trees. It is recommended that future project designs include a dedicated strategy to reach the most vulnerable with performance measurements to assess their inclusion.

ENVIRONMENT

The FLR project contributed to a number of positive and sustainable changes to the environment. Both tree density and the demand for tree seedlings increased, and adoption for FLR practices was found to occur even outside project areas. There has also been an increased appreciation for tree planting and agroforestry, stemming from the project's intentional linking of environmental restoration with livelihoods and food security incentives, which will only further motivate continued practice.

The project's actions have also demonstrated that sustainable development, including improved income and food security, is achievable while also sequestering carbon and mitigating climate change. World Vision Rwanda's interest in the mitigation potential, and the ability for communities to generate ancillary income through the sale of carbon credits, is growing. The project went beyond mitigation and piloted a targeted approach for the sustainable protection and restoration of natural environment by increasing tree density through an economically viable model. Influencing government policy on environment and land management remains a recommended future action for World Vision Rwanda.

Crop production in Rwanda's Eastern Province is steadily increasing through the efforts of the FLR project and its participants.

RECOMMENDATIONS

OVERALL RECOMMENDATIONS

Continue strengthening value chains and create opportunities for market linkages

Many producers' cooperatives received training on how to link to markets and commercialise their produce, though these opportunities could not be fully realised until their trees were sufficiently mature to produce for market. Project participants would greatly benefit from strengthening market linkages with input suppliers, such as cooperative nurseries, and financial institutions to enhance production and post-harvest management.

Expand gender mainstreaming and focus on targeted activities

Amplify the inclusion of gender in future projects, including in monitoring and evaluation. Integrate a gender analysis to identify value chains and interventions centred on gender-inclusive business models. Scale-up trainings like GIFT to further enhance women's agency and promote equitable systems.

RECOMMENDATIONS FOR OUTCOME 1:

Utilise energy saving technologies

Efforts to increase firewood production should be accompanied by interventions to address inefficient utilisation. Advocating to the government to invest in renewable electricity grids, particularly in smaller urban centres, would also significantly alleviate demand for charcoal.

RECOMMENDATIONS FOR OUTCOME 2:

Focus on building resilience in farmers, households and communities

- Ensure farmers' long-term access to water through affordable technologies, such as wells or tanks, so they can cope with prolonged dry seasons and maintain agricultural productivity.

- Prioritise training and support for pest and disease control to mitigate the damaging effects of these challenges on crop production.

- Support nursery cooperatives with technical and financial resources, allowing them to serve as a sustainable source of planting material for communities.

- Scale-up financial inclusion interventions, such as S4T groups, to build households' resilience against financial shocks.

RECOMMENDATIONS FOR OUTCOME 3:

Engage in public policy advocacy

Leverage the government's role in tree planting by adopting an issues-based approach to influencing policy. Identify key project-related issues, analyse these issues through research and disseminate the evidence to government authorities along with support for proposed solutions.

Gilbert is giving a ripe pawpaw to his son Prince. Growing fruit trees provides both produce and income.

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