



Regreening Africa



REGREENING AFRICA

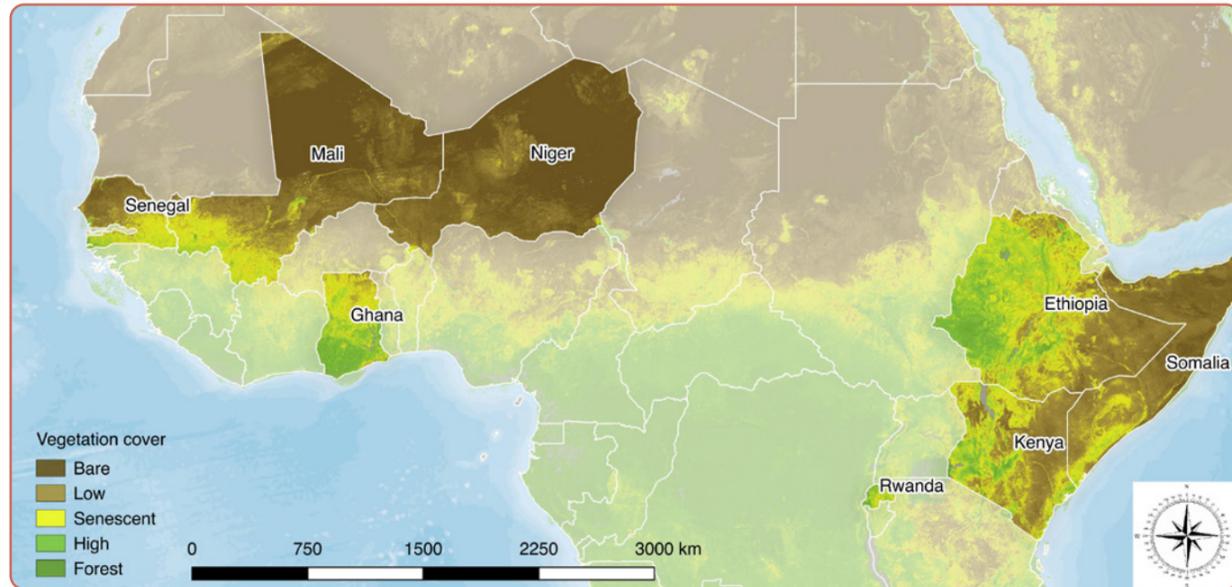
RWANDA Country Overview

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Regreening Africa Project Overview

Regreening Africa is an ambitious five-year project (2017-2022) that seeks to directly reverse land degradation across eight countries in sub-Saharan Africa by integrating trees into agricultural systems while improving the livelihoods, food security, and climate change resilience of smallholder farmers. The program's vision is to spur regreening among 500,000 households and across one million hectares in Ethiopia, Ghana, Kenya, Mali, Niger, Rwanda, Senegal and Somalia, thereby catalyzing a much larger scaling effort to regreen tens of millions of hectares of degraded land across the continent.

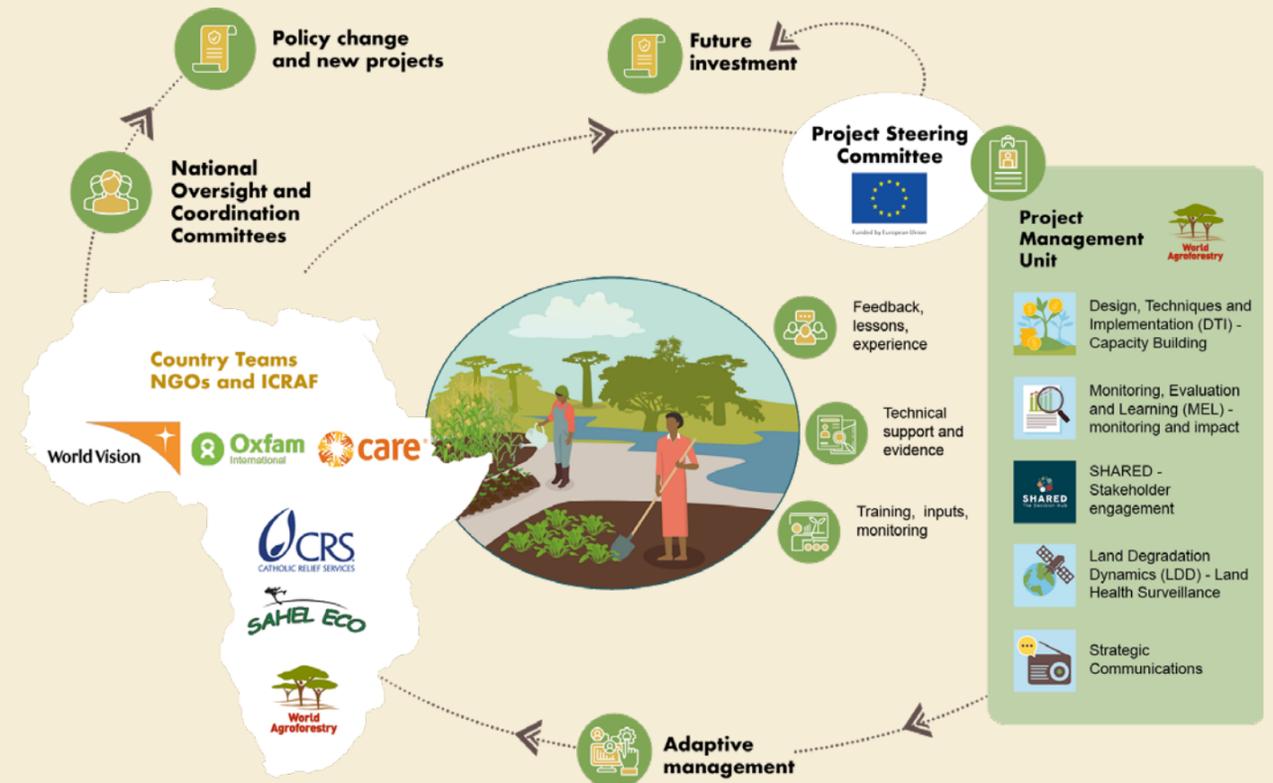


To achieve this over the past five years, Regreening Africa has been mobilizing and working with diverse partners to scale-up evergreen agriculture, using locally appropriate techniques including Farmer-Managed Natural Regeneration/Assisted Natural Regeneration (FMNR/ANR), tree planting and other forms of agroforestry and complementary sustainable land management interventions.



The program's unique engagement approach, partnership model, and advisory capacity operate with a goal of sustaining the land restoration movement within local and country-level control beyond the five-year program. Thus, Regreening Africa engages in strategic decision-making for scaling, working across the eight countries to collect and apply evidence in multi-stakeholder engagement and policy processes. The program promotes proven land restoration techniques adapted to suit the needs of farmers under varying socio-ecological contexts. While adapting to

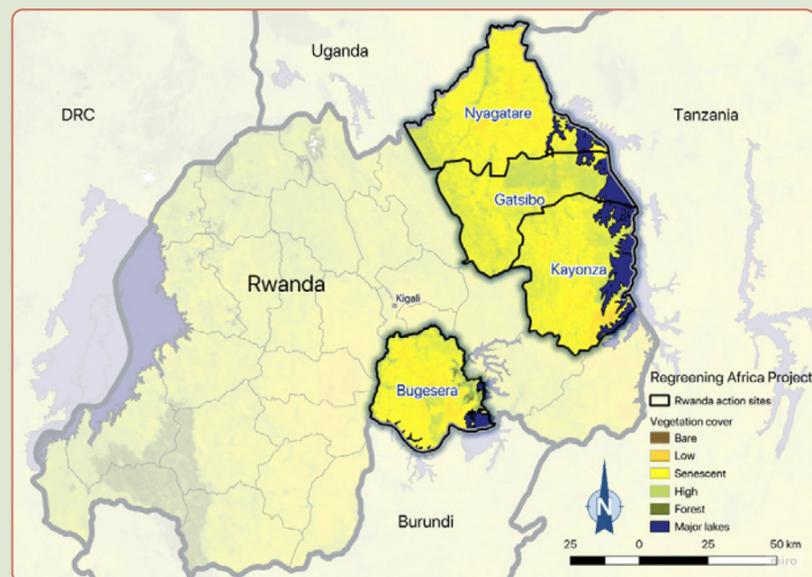
diverse circumstances, the program prioritizes gender, youth empowerment, and food security as outcomes of implementation. The program operates as a consortium of research partners (ICRAF) and implementing NGOs (World Vision, CRS, Care, Sahel Eco, Oxfam) with local governments and communities. Through the use of monitoring tools like the Regreening App developed by ICRAF, citizen scientists are empowered to take charge of monitoring the initiative's progress and giving stakeholders a more holistic picture of local realities.





Context for addressing land degradation in Rwanda

Rwanda, a country with one of the highest population densities worldwide, struggles with a trend of deforestation and land degradation due to unsustainable farming and grazing practices as well as reliance on woody biomass for fuel. Compounding factors to land degradation and erosion are steep slopes, inconsistent rainfall, and a changing climate. The lower-lying Eastern Province experiences some of the most challenging agro-ecological conditions in the country, with increasingly erratic precipitation and prolonged dry spells in the project area. In response to these trends, Regreening Africa in Rwanda has been working within ambitious national targets for reforestation to promote adoption of agroforestry in policy and practice (especially tree planting initiatives). These together are beginning to reverse the trend of deforestation and land degradation in Rwanda. Understanding and monitoring complex interaction of biophysical properties of land—Soil Organic Carbon, erosion, vegetation structure, and others—is guiding a more comprehensive understanding of the need for and progress of regreening practices, as explored in a recent publication by members of the program's Land Degradation Dynamics team.¹ Meanwhile, the economic case for regreening in Eastern Province is clear; according to a 2020 Economics of Land Degradation Report, the return on investment of afforestation is greater than 4 to 1 compared to business as usual.



Regreening Africa operates in Bugesera, Kayonza, Gatsibo, and Nyagatare Districts of Eastern Province with World Vision Rwanda and ICRAF Rwanda as primary partners. The project targets 70,000 households adopting evergreen agriculture practices over an area of at least 100,000 hectares. The planned targets to be achieved through project direct scaling activities are 21,000 households and 21,000Ha while the rest (49,000 Households and 79,000Ha) will be achieved through projected leveraged adoption

– promoting and providing expertise on tree planting, FMNR, and other regreening practices to partner organizations and local government bodies.

The program has set its sights on the following intended impacts in Rwanda:

- Increase in tree density and diversity.
- Increase in fruit trees in the landscape
- Increased awareness of land degradation and restoration measures

¹ Winowiecki, L. A., Bargaes-Tobella, A., Mukuralinda, A., Mujawamariya, P., Ntawuhiganayo, E. B., Mugayi, A. B., Chomba, S., & Vågen, T.-G. (2021). Assessing soil and land health across two landscapes in eastern Rwanda to inform restoration activities. *SOIL*, 7(2), 767–783. <https://doi.org/10.5194/soil-7-767-2021>



How Regreening Africa promotes land restoration in Rwanda

Implementation in Rwanda operates both at the community and policy level. First, World Vision Rwanda works directly with local communities, primarily through site training visits and training 512 lead farmers (51% of whom are women), who in turn disseminate knowledge and support scaling. At the community and household level, the program provides support and resources for farmer cooperatives and nursery groups in building fresh product value chains, especially high-value products like fruits, and the technological and ecosystem services (e.g. quality germplasm) to support these. A special focus is directed towards women's and youth empowerment, with tree seedlings production and fruit tree value chains a promising domain for women's entrepreneurship and increased household nutrition.

Secondly, World Vision, with guided support from ICRAF (especially via the SHARED component), supports policy, practice and investment decisions of government, civil society and rural institutions. Program partners advocate for integration of agroforestry into national reforestation and land restoration targets and provide support for increased government adoption through agroforestry research, decentralized technical services, and developing sustainable business models around tourism and agriculture. Along with this, the program seeks to strengthen the government's ability to assess the costs of land degradation and the economic benefits of investment in sustainable land management.

Agroforestry has been successfully integrated into the government agenda through programs such as the National Agroforestry Strategy and Action Plan (2018-2027) and the connected National Agroforestry Taskforce, led by ICRAF Rwanda's Dr. Athanase Mukuralinda. Meanwhile, the project regularly conducts learning events at different levels: biannual National Oversight and Coordination Committee (NOCC), annual Joint Reflection and Learning Missions (JRLM), and annual reflection and learning with local leaders and community-based groups and farmers. In the long term, the program supports the Rwandan government's strategic decision-making and monitoring for the scaling-up of evergreen agriculture by equipping the country with surveillance and analytic tools on land degradation dynamics, including its social and economic dimensions.



How Regreening Africa has engaged with rural populations in Rwanda

A clear lesson of the program is that rural populations adopt agroforestry in light of economic incentives, especially the increased household income from tree-based value chains.

Meanwhile, key barriers to widespread agroforestry uptake are;

- Access to high-quality seeds,
- Starting capital, and training in agroforestry techniques.

Due to reliance on centralized sources for lower quality free seeds, a persistent challenge has been;

A lack of diversity both in tree species and agroforestry practices as well as the limiting of growth of agroforestry-related businesses.

To respond to these challenges, the project has delivered a number of activities in line with creating awareness, sensitization and policy influencing for scaling greening practices.

In this regard, the project implemented different activities focusing mainly on seedling production and tree planting across the four districts of direct scaling sites with emphasis on sustainability components as the project is in the last year of implementation. Importantly, the project encourages planting a diversity of native tree species. Promoting access to quality tree planting materials, Regreening Africa deploys its robust scientific research to enhance agroforestry trees' suitability and growing techniques for local agro-ecological conditions. Meanwhile, the project has begun intensifying the scaling of Farmer Managed Natural Regeneration (FMNR) across all direct scaling sites, as this is a rapid, low-cost, and easily replicated approach to restoring and improving agricultural, forested and pasture lands in semi-arid areas.

In terms of value chains, farmer cooperatives and groups centered especially around nursery management and fruit production have been identified and supported. The most preferred value chains include fast-growing fruit trees like tree tomatoes, papaya, avocado and mangoes,

which offer high economic value for the domestic market along with enhanced household nutrition. Producer group members and other farmers involved in fruit tree growing have been trained in orchard management principles and techniques, including pest and disease management. Likewise, the project conducted capacity building activities for fruit producer groups and tree nursery cooperatives, equipping them with skills in bookkeeping, financial management, governance, and marketing. Business and marketing skills among smallholders remain important gaps to be addressed. The project worked with nursery cooperatives to produce marketable and preferred tree seedling species, which they have started selling as a business with limited support from the project.

Finally, World Vision Rwanda has partnered with the African Evangelistic Enterprise to contribute to access to finance for smallholder farmers through the Saving for Transformation (S4T) model. Forming 264 saving groups with 6,923 members (4,810 female/2,113 Male) across all scaling sites, farmers are able to engage in income generating activities and invest in greening initiatives such as buying fruit tree seedlings. Saving groups also offer a good platform to increase awareness on greening practices for both members and their neighbors.

The mode of engagement has focused on identifying and training lead farmers to engage in peer-to-peer dissemination of knowledge, along with support of farmer collectives. Among project countries, Rwanda has seen high rates of successful knowledge transfer from ICRAF's technical capacity and high rates of adoption of tree planting.

Key to this success are the establishment of three Rural Resources Centers (RRCs) across project areas to serve as sites for training and distribution of seeds, as well as the establishment of community tree nurseries managed by farmer groups.



Key interventions and practices in Rwanda

Agroforestry – the deliberate and systematic integration of trees with crops, communal areas, and pasture, which is central to the sustainable management of land and maintenance of healthy landscapes. Benefits of agroforestry range from carbon sequestration and biodiversity to boosting the integrity, hydration, and nitrogen fixation of soils, while providing an additional source of food, fuel, and marketable tree products for farmers and pastoralists.

Agroforestry provides multiple benefits and services, including soil-fertility improvement, soil erosion control and climate-change mitigation. Products from agroforestry, such as for fodder, stakes for climbing beans, fuel wood, fruit and timber, are of economic value relative to other crop products. To scale up these practices, more investment is required across Rwanda's agro-ecological regions in farmer mobilization and dialogue and in increased availability of seedlings that are suitable for agroforestry trees.

Practices of agroforestry can take many forms. Below are the agroforestry practices that collectively make up Rwanda's project focus, followed by a comparison chart of complementary practices and their niches:

FMNR (Farmer-Managed Natural Regeneration)

Systematic regeneration and sustainable management of trees and shrubs beginning with stumps, roots, and seedlings of already established trees. FMNR takes place on agricultural and pasture lands and is especially effective for semi-arid areas. Drawing on indigenous techniques of the Sahel, FMNR improves soil health, reduces erosion, and increases the number and diversity of trees in fields, largely indigenous or local species. Additionally, FMNR species can be exploited for fuelwood, fodder, construction, or marketable fruits and medicinal products. To accomplish this:

- 1 Farmers select desired tree shoots, and for each, choose a number of the tallest and straightest stems to leave.
- 2 Remove the unwanted stems and side branches. Manage any threats to remaining branches from livestock and fire. Removed branches can be used as fuelwood and leaves as mulch.
- 3 Cull emerging new stems and prune side branches from time to time.²

FMNR has not yet received large-scale adoption in Rwanda like tree planting due to the small size of farmer plots, but research is underway by ICRAF Rwanda about the suitability of scaling up this practice in Rwanda.

²Rinaudo, T., Muller, A., & Morris, M. (2019). *Farmer Managed Natural Regeneration (FMNR) Manual*. 204.



Nurseries

Controlled spaces where young tree seedlings or other plants are propagated in large quantities prior to their transplant into the field or for sale in markets. They are more suitable for areas with less ideal soil conditions and see a higher survival rate of plants compared to traditional tree planting. Tree seeds are legally required to be supplied by the National Tree Seed Center or any other person/institution authorized by the National Tree Seed Center. NGOs and other actors buy and distribute seeds to farmers/cooperatives.

Tree nursery cooperatives are playing an important role in producing diverse seedlings such as *Grevillea Robusta*, *Solanum betaceum*, and *Carica papaya* to support land restoration and provide agroforestry products and services.

To help address critical knowledge and material support gaps, Rural Resource Centers (RRCs), which are local hubs to foster farmer peer learning and exchanges, have been established in strategic locations in Gatsibo, Bugesera, and Kayonza districts in collaboration with farmer cooperatives and local authorities. They demonstrate and disseminate technical knowledge and improved

planting materials to support various practices, while also serving as training grounds on key areas of interest such as transforming tree nurseries into viable enterprises.

In Rwanda, seedlings are sometimes raised in a nursery using traditional shade methods for seed beds and pots, including the use of local shading materials such as maize and sorghum stalks, banana leaves, twigs and grasses. However, these methods inhibit photosynthesis, blocking sunlight from reaching the seedlings. This limits seedling growth and can cause death from damping off or other diseases.

Modern nursery design involves the construction of individual, shaded seed beds with removable shades. This ensures effective germination and optimal conditions for seedling survival and growth.

Types of tree nurseries in Rwanda:

- Temporary or flying nurseries, which can be utilized for one or two seasons
- Permanent nurseries, which can serve for an extended period of time, thus enabling seedlings to be raised from year to year.

Tree Planting

Traditional planting of seeds or young plants is the most popular activity in Rwanda. These trees can be used for fruit, fodder and other non-timber product value chains, and are commonly planted as boundaries, along roads, among crops, or within home gardens for household use depending on lot size. For instance, farmers with large plots of land prefer planting woodlots and fruit orchards while others opt for intercropping or home gardening, including fast-growing tree tomatoes and papayas. Additionally, trees planted can enhance soil health and, through biomass incorporation, increase soil organic carbon. An ongoing effort of the project is to promote diverse and especially native tree species.

Comparison of Prominent Regreening Practices with their Niches and Purposes

Practices	Niches	Purpose
 Fertilizer trees	Contour hedges	Improving soil fertility, erosion control, improving crop yields
 Fodder trees/shrubs	Boundary planting, contour hedges	Increase milk production and income generation
 Woodlots	Individual plots	Fuel wood, restoration of degraded soils, economic benefits
 Timber	Boundary planting	Income generation
 Silvopastoralism	Boundary and scattered planting	Livestock shade, fodder, timber, fire wood
 FMNR	Scattered trees	Promoting indigenous species and management Livestock shade, fodder, timber, firewood, landscape restoration.
 Fruit tree growing	Home gardens, Orchards, Scattered in fields	Improving Nutrition, income generation, motivation



Timeline of Key Events

YEAR 1 (2017-2018)

- Project launch in Nairobi (covering all eight countries)
- Establishment of a National Oversight Coordination Committee (NOCC)
- Strategic planning meeting held in Ethiopia with the country teams and the Project Management Unit to harmonize approaches and reorient the country teams for effective implementation of activities in the second year
- Baseline studies conducted
- Staff recruited and trained
- Project introduced to different stakeholders from government at all levels (national/regional/local) to local and international NGOs, FBOs
- Baseline data collection
- Site selection for tree planning, 33 nurseries established, high quality tree seeds purchased and distributed
- 33 farmer groups selected through WV partnership criteria
- 512 lead farmers selected across four districts

YEAR 2 (2018-2019)

- SHARED workshop conducted, bringing together government officials, public institutions, local stakeholders to identify role of each in operationalizing national agroforestry strategy
- 33 contracted farmer groups and cooperatives exceeded targets for number of seedlings produced and planted
- 31 new farmer groups selected through WV partnership criteria
- 256 (128 F/128 M) Lead Farmers trained on agroforestry technology/practices and FMNR, 188 cooperative members (49 F/139 M) trained on nursery establishment and management
- Structured evidence sharing and joint quality monitoring site visit that gathered WV and ICRAF Country and Head Office staff and other country stakeholders represented from Rwanda Agriculture Board (RAB) and Districts

YEAR 3 (2019-2020)

- Joint tree planting event which brought together all EU local delegation staff led by the Ambassador, Ministry of Environment, Bugesera district, WVR staff led by the National Director, farmer organizations and local community members conducted in Bugesera.
- Regreening Africa project planning and learning workshop at Nairobi ICRAF Headquarters attended by all implementing partners, learning field visits of Rwanda country staff to WV Kenya sites
- Implementation of data collection by Regreening App begins
- Rural Resource Center established to provide training in agroforestry and provide high quality seedlings
- 2 joint Monitoring and Evaluation field visits with district, sector, cell, lead farmers and farmer cooperatives members
- Disability inclusion training organized by Forest landscape Restoration (FLR) attended by 12 WVR staff, including 4 facilitators from Regreening
- 32 new cells and farmer groups recruited and trained to establish nurseries and produce seedlings, supported with high quality seeds from RAB
- Fruit-producing farmers mapped and aggregated into groups, supported with negotiation training and value chain development

YEAR 4 (2020-2021)

- Annual reflection meeting with local stakeholders across all 4 districts
- Began process of strengthening the 3 established Rural Resources Centers (RRC); capacity building on orchards management, nursery commercialization
- Business manual developed through collaboration between WV Australia and Australian NGO Cooperation Programme Forest and Landscape Restoration (ANCP-FLR) project to support tree seedling commercialisation and strengthening activities by cooperative groups
- Nairobi-based ICRAF team unable to attend field visits due to COVID-19
- Two tree planting events held in Nyagatare in government-prioritized integrated development model villages (Aggregated settlements established by the government for people relocating from risky zones)
- World Vision Rwanda commits to plant over 7 million trees
- Agroforestry sensitization through radio spots and articles in Rwanda's leading daily newspaper
- Partnership with 63 farmer cooperatives to produce tree seedlings – extended cells of operation and farmer cooperatives from 32
- 68 youth trained on Regreening App
- JRLM conducted with the Regreening Project implementing team, ICRAF country office team and local stakeholders. 4 scaling sites/districts visited, where the teams interacted with farmer groups, visited nurseries and RRCs as well as exploring adopted regreening options

YEAR 5 (2021-2022)

- Partnership with African Evangelistic Enterprise to implement the Saving for Transformation program. 264 saving groups with 6,923 members (4,810 female/2,113 Male) were formed across project direct scaling sites. In this year 111,783,190 Rwf were saved, while 115,012,415 Rwf in small loans were given out to members cumulatively
- Community Tree Planting event organized with EU delegation
- Concluded data collection for Endline Survey
- Value chain capacity building – fruit producer and tree seedling producer groups formed. Tree seedling producer groups have started selling seedlings as a business
- FMNR training: 156 participants (93M/68F) comprising FMNR promoters, nursery cooperatives members and lead farmers were trained on FMNR and provided with FMNR manuals and FMNR T-shirts. 8 new FMNR plots were identified; the FMNR promoters are engaging in peer-to-peer training and showcasing example plots
- Local expert contracted to carry out gender mainstreaming and disability inclusion with the purpose to address the gender and disability inclusion gaps identified in previous assessments. Overall, 1,576 people were trained—909 (57.7%) were male and 667 (42.3%) were female
- Rwanda Agroforestry Task Force (RATF) established: a collaborative coalition involving Ministries, Public Institutions, International Organizations, National and International NGOs, Farmer Federation Organization and Civil Society, aiming to implement Rwanda Agroforestry Strategy (2017-2025)
- 5 day course on beekeeping value chains that sustain and increase tree diversity on farm offered to WVR staff and managers from beekeeping cooperatives
- DTI team conducted refresher Training of Trainers in collaboration with WV and NTSC Rwanda. The focus was to improve germplasm sourcing and handling, tree nursery entrepreneurship and increase knowledge about pest and disease diagnosis and management.



What have we achieved in Rwanda through the project?



Livelihoods - Creating more sustainable livelihoods

- Support (advisory, materials, business skills training) in value chains provided to 64 fruit tree producer groups, 63 nurseries producing seedlings, and 16 groups/individuals engaged in beekeeping and other crop value chains
- Tree seedling producing groups have started selling seedlings as a business
- Savings for Transformation project implemented in Year 5; 264 saving groups with 6,923 members (4,810 female/2,113 Male) formed across project direct scaling sites. In year 5 111,783,190 Rwf were saved, while 115,012,415 Rwf in small loans were given out to members cumulatively



Landscapes - Strengthening resilience to changing climates

Target type	Country targets	Actual target reached	Verification Approach used
Directly facilitated Households	30800HH (including additional target)	26,378	Regreening Africa App
Directly facilitated Hectares	52000Ha (including additional target)	75,627	Regreening Africa App
Leveraged Households	49,000Ha	36540	Project monitoring data
Leveraged Hectares	79,000Ha	TBD	

In the first four years of implementation:

- 19,550 households took up regreening practices (2020 Uptake Survey) and 39,055 hectares underwent restoration through direct facilitation (2022 Annual Report)
- 36,540 households received and planted trees through leveraged facilitation
- An estimated 70% household uptake rate as of the 2022 Annual Report
- 17 farmers have established biomass incorporation trials for maize, beans, and soy (as of Year 4)
- Over 11.7 million tree seedlings distributed, including 8.1 million agroforestry trees and 3.6 million fruit trees
 - **Year 4:** 5,161,120 seedlings; 3,167,192 agroforestry trees, 1,994,018 fruit trees
 - **Year 3:** 4,086,231 seedlings; 2,794,796 agroforestry trees, 1,291,435 fruit trees
 - **Year 2:** 2,515,189 seedlings; 2,149,798 agroforestry trees, 365,391 fruit trees



Currently:

- Nearly 1.7 million tree plantings registered on Regreening App with 71% survival rate
- According to endline Monitoring and Evaluation data:**
- Households undertook more regreening practices at endline compared to baseline
 - Significantly more new trees established at homestead and in cropping fields at endline compared to similar period at baseline
 - Tree planting increased significantly between baseline (<20% of program HHs surveyed) and endline (>60% of program HHs surveyed)
 - Number of native tree species slightly but insignificantly decreased from baseline to endline, while the number of exotic tree species increased significantly overall. No difference observed between treatment and comparison sites
 - Tree numbers and density increased significantly both around homestead and on farms between baseline and endline



Capacity - Knowledge turns to action

- Higher exposure of households to agroforestry-related external assistance (especially tree planting, followed by tree care and management) during the project period compared to baseline period, though this was true of both program areas and control groups
- Over 36,000 Regreening App users in Rwanda registered with Tree Planting Module as of July 2022, the highest activity level among program countries
- To scale up adoption of FMNR, 512 lead farmers and 63 cooperatives trained by DTI (Design, Techniques and Implementation) project component and ICRAF Rwanda across 4 districts in collaboration with Rwanda Agricultural Board through extension services and FMNR handbooks
- 3 RRCs established and strengthened to provide extension services, facilitate peer-to-peer training, and serve as a possible distribution point for germplasm and mother blocks, especially of fruit trees
- Trainings provided by DTI component on identifying and managing pests and diseases, value chains in beekeeping, seed collection
- Highest percentage of households reached through projects/NGOs

“
Three years ago, I received training from World Vision on tree nursery establishment and management. Thanks to the quality of tree seedlings provided, which included early maturing fruit trees, my life has gradually improved. Money that was hard to come by is no longer the case, as school fees for my children are always paid on time. I can even afford to pay laborers to cultivate my farm”

Murekatete Patricia, farmer in Nyagatare District.



Partnerships - Engaging across sectors

- Extension services provided in collaboration with Rwanda Agriculture Board
- Savings for Transformation project implemented with African Evangelistic Enterprise
- Coalition of government agencies, civil society, and international NGOs in RATF
- Leveraged approach to regreening activity adoption with World Vision Rwanda's other programs as well as government initiatives



Women and Youth - Change requires engaging everyone

- Sensitisation and workshops with mayors on better land governance to facilitate equitable access to land for all, especially women and young people, resulted in 2.71 ha of land being given to women in the commune of Thiare for tree and market gardening.
- NTFPs are especially important for increasing women's participation in the market and a women's collective focused on baobab powder was created in Kaffrine.
- In areas where there has been significant natural regeneration, women no longer travel long distances to collect firewood, reducing burdens of labor and time.
- School nurseries provide engage youth and teach them regreening practices they can take back to their households.

“
Many women used to think that nurseries were for men, but now their attitude has changed”

Louise



Policy and Enabling Environment - Integrating decision makers at all levels

“
Integrating trees into landscapes through agroforestry has been a fundamental approach recognized by the Government of Rwanda and our partners to meet national targets for restoring degraded land, increasing trees on farms, increasing our country-wide forest cover and enhancing the lives and livelihoods of the people of Rwanda.”

Hon. Dr. Vincent Biruta, Minister of the Environment

- Rwanda Agroforestry Task Force (RATF) established in 2021: a collaborative coalition involving Ministries, Public Institutions, International Organizations, National and International NGOs, Farmer Federation Organization and Civil Society, aiming to implement the Rwanda Agroforestry Strategy (2017-2025)
- Integration of tree planting into national initiatives like Umuganda (Monthly Community Work Days)
- Project provides knowledge and implementation base for Rwanda government's incorporation of agroforestry into national land restoration targets such as the Bonn Challenge/AFR 100, Agroforestry Strategy and Action Plan (2018-2027), and National Strategy for Transformation (2017-2024)



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