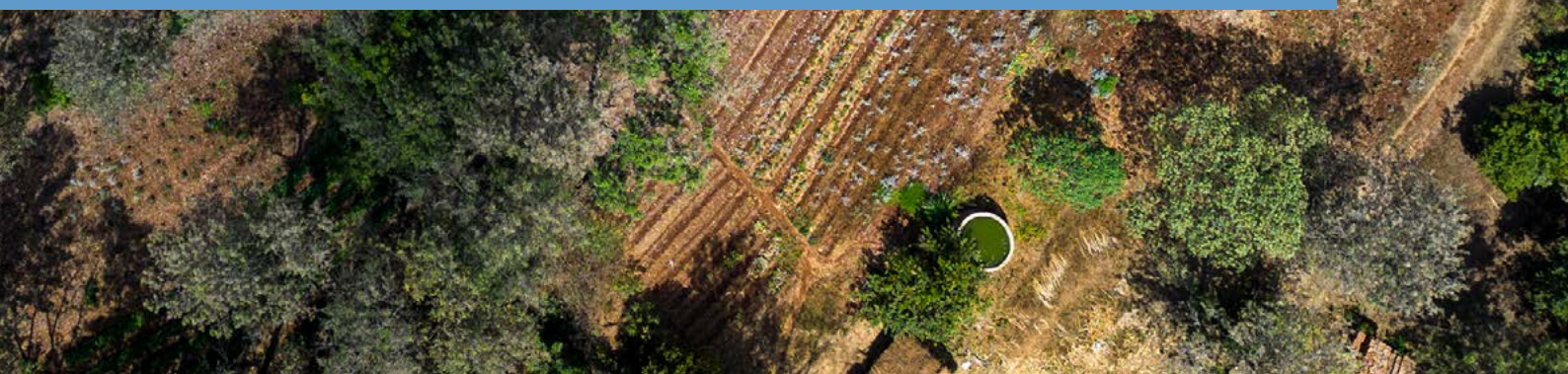


# Promoting agroecological productivity through smallholder management in northern Tanzania

A case study of producer organisation Mtandao wa Vikundi vya Wakulima na Wafugaji Mkoa wa Arusha (MVIWAARUSHA)



## Authors

Canisius John Kayombo

Geofrey Bakanga

Richard Masandika

Damian James Sulumo

Frank Hillary

Corresponding author: Canisius John Kayombo, [kayombo33@yahoo.co.uk](mailto:kayombo33@yahoo.co.uk)

Published by IIED, December 2025

Kayombo, CJ, Bakanga, G, Masandika, R, Sulumo, DJ and Hillary, F (2025) Promoting agroecological productivity through smallholder management in northern Tanzania. IIED, London.

[www.iied.org/22691g](http://www.iied.org/22691g)

International Institute for Environment and Development  
44 Southampton Buildings, London WC2A 1AP, UK  
Tel: +44 (0)20 3463 7399  
[www.iied.org](http://www.iied.org)

[www.linkedin.com/company/iied](http://www.linkedin.com/company/iied)  
[www.facebook.com/theIIED](https://www.facebook.com/theIIED)

Read more publications at [iied.org/publications](http://iied.org/publications)



IIED publications may be shared and republished in accordance with the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International Public License (CC BY-NC-ND 4.0). Under the terms of this licence, anyone can copy, distribute and display the material, providing that they credit the original source and don't use it for commercial purposes or make derivatives. Different licences may apply to some illustrative elements, in which instance the licence will be displayed alongside. IIED is happy to discuss any aspect of further usage. Get more information via [www.iied.org/website-terms-conditions](http://www.iied.org/website-terms-conditions)

Cover photos: aerial shot of an agrobiodiverse smallholder farm in Ayalabe village, Karatu district (top); a farmer from Dofa village in Karatu district practices crop diversification, organic farming and has a tree nursery (bottom left); Indigenous seed varieties from a farmer-managed seed bank in Kambi ya Simba village, Karatu district (bottom centre); beekeeping in Esilalei, Monduli district (bottom right). Credit: Roshni Lodhia/Panos/IIED

IIED is a charity registered in England, Charity No.800066 and in Scotland, OSCR Reg No.SC039864 and a company limited by guarantee registered in England No.2188452.

## Contents

List of figures and tables .....	3
Acknowledgements .....	3
Abbreviations .....	4
Summary .....	5
1. Introduction to MVIWAARUSHA and its land-use impacts .....	7
1.1 MVIWAARUSHA's vision and mission .....	7
1.2 Foundation of MVIWAARUSHA .....	7
1.3 Location .....	8
1.4 Membership .....	9
1.5 Patterns of land use .....	9
2. Agrobiodiversity in the landscape .....	10
2.1 Cash crops grown by men .....	10
2.2 Cash crops grown by women .....	12
2.3 Subsistence crops grown by men .....	15
2.4 Subsistence crops grown by women .....	16
2.5 Wild products harvested by men .....	16
2.6 Wild products harvested by women .....	17
2.7 Crops varieties .....	17
3. Crop cultivation and rearing livestock: knowledge sources .....	19
3.1 Biocultural heritage .....	19
3.2 Intergenerational knowledge transfer within households .....	20
3.3 Knowledge transfer between neighbours .....	20
3.4 Organisational knowledge networks .....	21
4. Cultivating and managing seed and animal resources .....	22
4.1 Self-provisioning and multiplication of seed .....	22
4.2 Bartering for and purchasing seed .....	22
4.3 Formal purchasing systems and community seed banks .....	23
5. Enterprise strategies and agrobiodiversity .....	25
5.1 Cash-crop enterprises .....	25
5.2 Changing patterns of cash cropping .....	25
5.3 MVIWAARUSHA's role in shaping what is sold .....	25
5.4 Future plans .....	26
6. Finance strategies for diversified production .....	27
6.1 Internal finance mechanism .....	27
6.2 Financial services that support agrobiodiversity .....	30
6.3 FFPO role in external finance partnerships .....	31
6.4 Future plans .....	32
7. Conclusions and recommendations .....	34
7.1 Conclusions .....	34
7.2 Recommendations .....	34
References .....	35

## List of figures and tables

Figure 1. How MVIWAARUSHA uses networking to achieve its agroforestry vision.....	8
Figure 2. A coffee plantation of almost 4ha with more than 0.5ha for growing pumpkins and other vegetables for sale .....	10
Figure 3. Cash crops grown by the ten men farmers surveyed .....	10
Figure 4. Livestock reared by one an MVIWAARUSHA member in Karatu .....	11
Figure 5. Livestock animals reared by the ten men farmers surveyed .....	12
Figure 6. Women maize farmers from Mto wa Mbu in Monduli district in the field weeding and checking for diseases that attack young maize, and at the local market selling their crops .....	13
Figure 7. Cash crops grown by the ten women farmers surveyed .....	13
Figure 8. Livestock reared by MVIWAARUSHA women members at Mto wa Mbu in Monduli district. ....	14
Figure 9. Livestock animals reared by the ten women farmers surveyed .....	15
Figure 10. Communities produce and sell natural products such as honey, and traditional fabrics made from cotton or other natural fibres.....	19
Figure 11. A chameleon observed in a vegetation patch near an MVIWAARUSHA member's house .....	20
Figure 12. At one of the MVIWAARUSHA member's homesteads.....	20
Figure 13. Zero grazing practiced by MVIWAARUSHA members.....	22
Figure 14. A community seed bank near Karatu, run by MVIWAARUSHA members . <b>Error! Bookmark not defined.</b>	
Figure 15. How MVIWAARUSHA promotes sustainable resource management in Karatu and Monduli.....	24
Table 1. Total MVIWAARUSHA members 2021–2023.....	9
Table 2. Percentages of cash crops sold by the ten men farmers surveyed .....	11
Table 3. Percentages of livestock sold by the ten men farmers surveyed .....	12
Table 4. Percentages of cash crops sold by the ten women farmers surveyed .....	14
Table 5. Percentages of livestock sold by the ten women farmers surveyed.....	15
Table 6. Subsistence crops grown by the ten men farmers surveyed.....	15
Table 7. Subsistence crops grown by the ten women farmers surveyed .....	16
Table 8. Uses of wild products harvested by the ten men farmers surveyed.....	17
Table 9. Uses of wild products harvested by the ten women farmers surveyed .....	17
Table 10. Uses of commercial and subsistence plants grown by MVIWAARUSHA members .....	18
Table 11. Financial and membership data of MVIWAARUSHA's SACCOs (in Tanzanian shillings) ...	29
Table 12. Allocation of revolving fund to MVIWAARUSHA's SACCOs (in Tanzanian shillings) .....	32

## Acknowledgements

The authors extend gratitude to FFF and GCBC for the opportunity to undertake the study on Mtandao wa Vikundi vya Wakulima na Wafugaji Mkoa wa Arusha (MVIWAARUSHA). The MVIWAARUSHA leaders are acknowledged for their support with this case study and for organising its group members to enable data collection. Additional thanks are given to Damian James Sulumo (programme officer MVIWAARUSHA) for offering the necessary information tirelessly whenever it was needed and Imani P Hezron (communication officer MVIWAARUSHA) who helped to link district government leaders and MVIWAARUSHA members during data collection. Thanks are also given to Seuri Mollel from TARI who supported with information on financial services for diversified production.

The updated case study has been reviewed by Duncan Macqueen, Isabela Nuñez del Prado Nieto and Janine Duffy of IIED, edited by Holly Ashley and laid out by Teresa Sarroca of IIED.

## Abbreviations

CMGs	Community microfinance groups
FAO	Food and Agriculture Organization of the United Nations
FFF	Forest and Farm Facility
FFPO	Forest and farm producer organisation
FMSS	Farmer-managed seed system
MVIWAARUSHA	Mtandao wa Vikundi vya Wakulima na Wafugaji Mkoa wa Arusha (Network of Groups of Farmers and Breeders of Arusha)
NCAA	Ngorongoro Conservation Authority Area
PAR	Portfolio at risk
SACCOs	Savings and credit cooperative organisations
SMEs	Small and medium enterprises

## Summary

This case study describes the work of the forest and farm producer organisation (FFPO) Mtandao wa Vikundi vya Wakulima na Wafugaji Mkoa wa Arusha (MVIWAARUSHA).<sup>1</sup> The FFPO represents almost 12,500 smallholder farmers organised into 446 local groups, including 46 ward-level networks and six district-level networks in northern Tanzania. Land use in the region is divided into two major categories: agricultural land specified for growing food and cash crops; and conservation areas (especially by the Ngorongoro Conservation Authority Area or NCAA, which is a totally protected area).

This case study largely looks in detail at Karatu and Monduli districts, however the information in section 6 extends to cover Arusha DC and Longido districts. Karatu and Monduli are enormously rich in agrobiodiversity because of the natural variation and productivity of tropical savanna and forest systems. MVIWAARUSHA works to promote agroecological productivity in the region and has taken part in the preservation of agrobiodiversity in both agricultural and forest landscapes. MVIWAARUSHA organises and supports its members in policy advocacy, agroecological productivity, the development of financial services and marketing, and promotes the effective mobilisation and management of the networks' resources. MVIWAARUSHA envisions a strong rights-based and socioeconomic network of empowered farmers and pastoralists achieving sustainable livelihoods from agriculture and animal crops.

The smallholder farmer's development success through MVIWAARUSHA is rooted in its members' solidarity. Most are involved in agriculture and rearing livestock, with a focus on the rehabilitation and restoration of degraded natural resources, protecting intact natural vegetation, and enriching agroforestry systems with trees on farms. Retained trees and woodlots within the homesteads of smallholder farmers offer fruit, lumber, poles, firewood, windbreaks, shade, livestock fodder and soil erosion control. The men and women smallholder farmers interviewed for this case study plant, sell and consume more than 20 commercial crops and 10 types of livestock (including bees) and extract a much wider range of less common vegetables, fruit and medicinal plants for regular use from the patchwork of forests and farms.

Knowledge management is key to maintaining that agrobiodiversity. MVIWAARUSHA draws heavily on its members' Indigenous knowledge of plant and animal cultivation — augmented by outside knowledge — and fosters this knowledge through projects, partnerships and practical farmer field school-type exchanges that enhance collective understanding of cultural behaviour and ecological sustainability.

MVIWAARUSHA has expanded its members' knowledge and experience in several key ways, by:

- Strengthening local groups and networks that encourage peer-to-peer learning and participation in market shows
- Attracting external support and knowledge from projects
- Developing professional staff capability and trainers-of-trainers in topics such as entrepreneurship, agroforestry, tree nurseries and tree planting, community seed banks, poultry rearing, and the use of livestock waste to make biogas
- Enhancing local communication through radio, television and social media, and
- Helping local groups to develop microcredit facilities and larger finance groups offering members community savings and loans schemes.

This has been further strengthened by the expansion of community-based financial services, including savings and credit cooperative organisations (SACCOs) and Community Microfinance Groups (CMGs), which provide accessible loans and savings schemes that support agroecological production and enterprise development.

Smallholder farming families play an important role in producing food for households and market demand in Tanzania. Tapping into community-centred Indigenous knowledge of agriculture, animal domestication and ecological sustainability provides a high level of agrobiodiversity protection compared with more industrial agricultural models. The MVIWAARUSHA leadership and committees

---

<sup>1</sup> Translated from the Swahili, 'mtandao wa vikundi vya wakulima na wafugaji mkoa wa Arusha' means 'network of groups of farmers and breeders of Arusha'.

serve to extend local community farmers' networks to help spread an agroforestry vision that integrates crops, trees, livestock, manure and compost, rainwater harvesting, enterprise development and finance. It also promotes the transfer of intergenerational knowledge. Most knowledge about plant and animal cultivation and management is transmitted from grandparents, parents and neighbours to their children.

Seed production — especially local climate-resistant varieties of crops and medicinal plants as well as local and exotic trees — has also been crucial to agrobiodiversity conservation. In addition to normal practices of acquiring seed (for example, through self-multiplication, bartering or purchasing commercially), MVIWAARUSHA has developed five community seed banks and a host of local tree nurseries that together help farmers to maintain control over and access to a wide diversity of crop varieties. MVIWAARUSHA promotes the role of both men and women in such ventures, working towards sustainable social, economic and ecological improvement.

Enterprise development that supports agrobiodiversity is being built through MVIWAARUSHA's trainings in entrepreneurship. It is backed by access to finance through microcredit facilities and larger community savings and loans schemes that are now almost ubiquitous across its local groups and networks. Market research and support for processing and packaging is emerging in key areas such as the production of sunflower oil, pigeon peas, honey and potentially coffee and other crops. These products are developed from agroforestry systems that maintain agroecological functions to be climate resilient. The organisation unites people with a diverse understanding of Indigenous resources and combines their efforts and talents in successful business development. As members, smallholder farmers have more financial security, for example through access to finance to help support their families and businesses. External knowledge (for example, about seed and livestock availability or market access) is spread easily throughout the organisation. Tailored agroecological loans, revolving funds, and financial literacy training have enabled members, especially women and youth, to experiment with traditional seed systems, adopt climate-resilient practices, and launch small ecological enterprises, including processing and marketing of agrobiodiverse products.

Tanzania has a rich biocultural heritage and MVIWAARUSHA is actively building on traditional agroforestry practices while also introducing innovations to strengthen agroforestry production. For example, it promotes the use of livestock waste to make biogas and slurry, the establishment of community seed banks, the development of diversified processing, packaging and marketing of different products, and establishing savings and loans schemes to fund its members' necessary investments. Yet it is perhaps the organisational solidarity within farmer groups and networks that offers the greatest source of innovation in conserving agrobiodiversity that will best sustain its members in the future. These efforts are underpinned by inclusive finance mechanisms that reduce the risks of innovation and promote the preservation and expansion of on-farm agrobiodiversity through farmer-led experimentation and seed system strengthening.

For future agroforestry sustainability, we recommend that MVIWAARUSHA:

- Identifies its most active members as trainers (those who very quickly learn from the successes of others and put this learning into practice).
- Provides more ongoing and practical hands-on teaching/education. Members find farmer field school-type approaches more useful than theoretical training.
- Promotes the greater use of agroecological approaches using drought resistant crops, cover-crop farming and agroforestry (for soil improvement and moisture retention).
- Protects natural vegetation patches in and around farms, including trees.
- Protects water catchment areas to ensure a sustainable supply of water for irrigation.
- Continues market research to access international markets for organically grown crops.
- Continues to support its members to attend agricultural markets, shows and seed fairs.
- Supports the integration of poultry huts (chicken huts) and other zero-grazing livestock to support food security and to ensure an ongoing supply of livestock manure.
- Continue to support and expand SACCO and CMG financial services that promote agroecological farming and seed system innovation, especially those benefiting women and youth.
- Enhance financial literacy and loan management training for SACCO and CMG members to reduce portfolio-at-risk and improve sustainability of community-based finance systems.

# 1. Introduction to MVIWAARUSHA and its land-use impacts

## 1.1 MVIWAARUSHA's vision and mission

The organisation presented here is Mtandao wa Vikundi vya Wakulima na Wafugaji Mkoa wa Arusha (MVIWAARUSHA). A member-based farmers' organisation, MVIWAARUSHA is a network of smallholder farmer and pastoralists groups in the Arusha region. Its head office is located in Njiro, Arusha town, Tanzania. The lands farmed by its members are located in the central zone of Karatu district, in the low zone of Monduli district, and in the high zone adjacent to the protected Ngorongoro Conservation Authority Area (NCAA).

MVIWAARUSHA aims to unite smallholder farmers to have a common voice to advocate for their economic, social, cultural and political interests while also addressing various gender concerns, so as to advance women's interests as well. Agrobiodiversity is seen by the organisation as central to food and livelihood security (Khush 1996). MVIWAARUSHA's vision is to balance care for human rights alongside achieving sustainability and quality in production, while creating:

*A strong, rights-based network of socioeconomically empowered farmers and pastoralists achieving sustainable livelihoods.*

MVIWAARUSHA also aims to become a knowledge hub for gathering and sharing information via its farmer networks in relation to high-quality production of agricultural crops and livestock, and the protection of domesticated and wild plants within the landscape around. Its mission is to:

*Attain collective voices and actions, sustainable high-agroforestry productivity, reliable markets and financial sustainability.*

Within that mission, MVIWAARUSHA has five strategic goals:

- Strengthening its network of farmers and pastoralists in the Arusha region
- Improving its lobbying and advocacy skills and actions
- Building the agroecological capacities of its farmer and pastoralist members
- Developing and effectively managing programmes, financial services and marketing interventions, and
- Effectively mobilising and managing the network's resources.

MVIWAARUSHA's commitment to agrobiodiversity is found in the third strategic goal. Agrobiodiversity is seen to contribute to agroecological farming that encourages sustainability. Sustainable agriculture necessarily involves tree planting and protecting native trees, both on farms and in adjacent protected areas of natural vegetation, which should minimise the impacts of climate change and contribute to food security (Sadio and Negrero-Gastillo 2003).

MVIWAARUSHA mobilises farmers and livestock keepers into groups within their regional areas of operation, helping its members to:

- Undertake enhanced environmental conservation activities (such as tree planting and protecting natural vegetation and water catchment areas)
- Produce high-quality crops and livestock
- Gain access to financial resources such as those offered by savings and credit cooperative organisations (SACCOs) and finance Community Microfinance Groups (CMGs)
- Better market their products, and
- Build their skills by providing training on how to process their farming products (crops, livestock and honey).

## 1.2 Foundation of MVIWAARUSHA

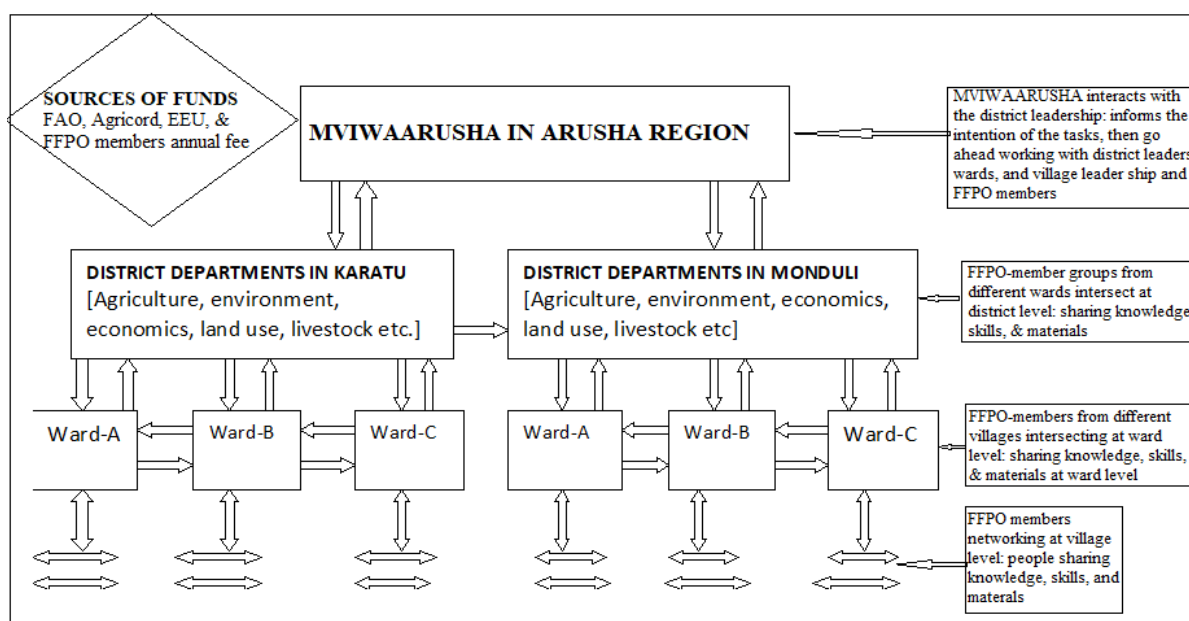
Originally named MVIWAMO, MVIWAARUSHA was established in 2011 as a network of farmers in Monduli district. As the network expanded to include members in Karatu district, Arumeru East and West districts, it was reregistered in 2013 as MVIWAARUSHA with registration number SA 19231. The MVIWAARUSHA management is now well known in Tanzania, with an active social media

presence. Operations now cover the Arusha regional level. There are six district networks within that region, 42 ward networks within those districts, and finally 446 village groups. Local members interact at village level, but then also occasionally interact with members of other villages, or sometimes at ward level in local networks. Different wards members will meet either during trainings, or as they share seeds, knowledge and skills, interact with other members from other wards within the district. Members from the two districts covered by this case study (Karatu and Monduli) with the coordination of MVIWAARUSHA, meet or interact at different levels to share their knowledge, skills and materials (see Figure 1).

MVIWAARUSHA receives finance from external and internal sources:

- External sources (including the Food and Agriculture Organization of the United Nations (FAO), Agricord and the European Union), and
- Internal sources (mainly from annual membership fees of approximately US\$2 per member per year (5,000 Tanzanian shillings) making a total of approximately US\$26,000 (62 million Tanzanian shillings) per year, depending on the increasing number of members.

**Figure 1. How MVIWAARUSHA uses networking to achieve its agroforestry vision**



### 1.3 Location

The MVIWAARUSHA groups surveyed for this case study cover the Monduli and Karatu districts of the northern highlands of Tanzania. MVIWAARUSHA is situated within the tropical savanna with a humid-subtropical climate. The area receives relatively sufficient rainfall to support agriculture and livestock production, although climate change is adversely impacting normal crop-growing schedules.

Within this region, MVIWAARUSHA operates in two major classified upland zones. The lower zone has an altitude of  $\geq 1000\text{m}$ , while the central zone around Karatu has an altitude of  $\geq 1,700\text{m}$ . The higher zone adjacent to the NCAA has an altitude of  $\geq 2000\text{m}$ . The lower and central zones are occupied by settlements, agricultural farms and grazing land within a patchwork of natural forest and woodland. These landscapes cross the Manyara National Park on the eastern arm of the Rift Valley.

The farming population lives on the undulating ridges of Karatu and the valley of Mto wa Mbu, which is well supplied with water from the area below Lake Manyara National Park. The areas are tropical savanna, with grassland patches, bush lands, thickets and tropical forest patches beautifying the landscapes. The agricultural systems managed by the Indigenous communities stand out for their high biodiversity and the use of agroecological approaches and traditional knowledge. The people strive for soil and water conservation. They visibly shape a colourful mosaic landscape in contrast to the haciendas which are characterised by large-scale monocultures based on biochemical and technological land-use packages that degrade the soil and water.

## 1.4 Membership

The MVIWAARUSHA network serves the six district councils of Meru, Arusha, Karatu, Longido, Ngorongoro and Monduli. MVIWAARUSHA works with more than 42 ward-level networks of smallholder farmers, each with its own operating office. The groups comprise of agricultural crop farmers, fisherfolk, small-scale beekeepers and livestock keepers, including pastoralists. The MVIWAARUSHA members possess a varied size of farms ranging from 1.5–5ha of land for cultivation. Most farmers sell around half of their crops with the rest kept for household consumption (subsistence).

MVIWAARUSHA has a varied number of members and groups that have joined since 2013. Its original groups have now substantially increased in membership, although some have decreased. In terms of diversified agricultural and animal crop production, the organisation has gradually developed a sophisticated support system. As of 2023, there 12,500 individual members within 446 local groups (up from 11,100 members in 2021) including 7996 women, 4,502 men, and 3,749 young people from 446 FFPO groups. Membership increased by 9.3% (1,032 people) and 25.2% (86 groups) between 2021 and 2022, even though there was a drop of 3.7% for men (173 people). Between 2022 and 2023, there was an increase of every type of group except for networking groups at district level (see Table 1).

**Table 1. Total MVIWAARUSHA members 2021–2023**

Membership	2021 members	2022 members	2023 members	Increase/Decrease in member numbers, 2021–2022	Increase/Decrease in member numbers, 2022–2023
Total members	11,098	12,130	12,498	1,032 (9.3%)	368 (3%)
Women members	6,436	7,741	7,996	1,305 (20.3%)	255 (3.3%)
Men members	4,662	4,489	4,502	-173 (-3.7%)	13 (0.3%)
Youth members	3,107	3,396	3,749	289 (9.3%)	353 (10.4%)
<b>Groups</b>	341	427	446	86 (25.2%)	19 (4.4%)
<b>Local networks</b>	32	36	42	4 (12.5%)	6 (16.7%)
<b>District networks</b>	5	6	6	1 (20%)	0 (0%)

## 1.5 Patterns of land use

The main official land-use categories occupied by MVIWAARUSHA members include mainly agriculture crop production land, but also some adjacent conservation land. The estimated amount of land used for agricultural crop production is  $\geq 80\%$  while the remaining  $\leq 20\%$  is natural ecosystems on both private and village-owned land. Each member owns at least 1.5ha for agricultural crop production.

The nature of land tenure on planned agricultural land is mainly private ownership but some is also communal land. The associated tenure of natural vegetation is private ownership, communal ownership (mainly controlled by village authorities), and government protected areas such as the NCAA at the border of farms. Privately owned land belongs to individuals or farming households where agriculture and livestock grazing are practiced at different seasons. Free grazing operates across almost all patches of land on which there is no cultivation such as those found at homesteads, stream banks or village authority land. However, during crop-harvesting, livestock grazing takes place on agricultural crop farms. A few cattle and goats (especially expensive stock hybrids) are zero grazed. Communal land is controlled by the village authority or several households. The NCAA national protected area is governed by national protection rules that prohibit any human activities including firewood collection, cultivation and settlements.

## 2. Agrobiodiversity in the landscape

### 2.1 Cash crops grown by men

Usually, men possess more land than women and they prefer to produce cash crops, including predominantly maize and beans. Crops that are produced over the longer term (such as Arabica coffee) are cultivated by few men in Karatu on a larger scale, together with short rotation crops that can be sold and consumed at household level (such as vegetables) (see photos below). However, Arabica coffee is not a common crop grown by either Karatu or Monduli farmers. MVIWAARUSHA male members in Karatu produce maize, beans and vegetables to sell to tourist hotels at the border of the NCAA, where they earn good prices. Coffee is sold to a coffee buying organisations in Tanzania and then shipped to the world market.

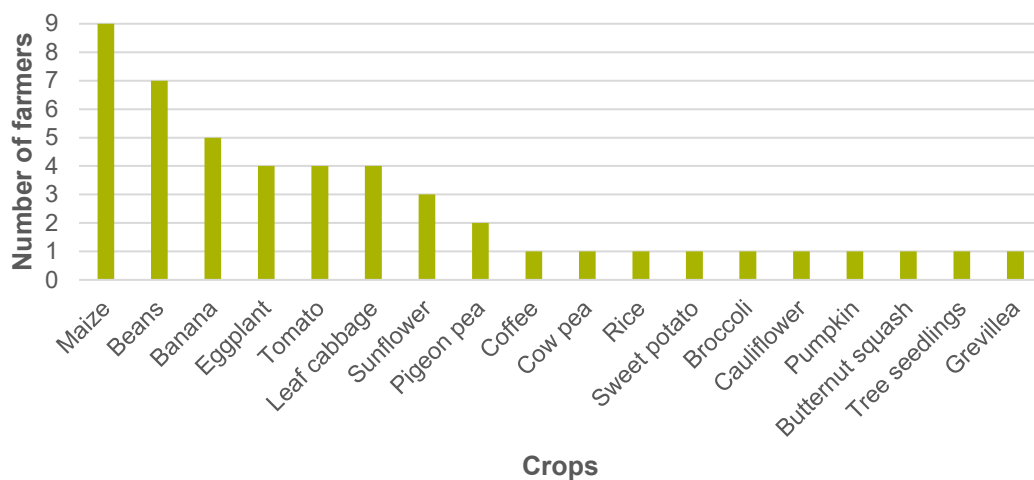
**Figure 2. A coffee plantation of almost 4ha with more than 0.5ha for growing pumpkins and other vegetables for sale**



Photo credit: Canisius John Kayombo

Commercial agricultural crops most commonly grown by the ten men farmers surveyed maize, beans, bananas, tomatoes, eggplants, sunflowers, leaf cabbage and pigeon peas. A few also grow a diversity of additional crops, such as sweet potatoes and broccoli (see Figure 3). However, the small sample size is insufficient to determine if these results are indicative of the crops commonly grown in the two districts.

**Figure 3. Cash crops grown by the ten men farmers surveyed**



The data were collected from particular farming areas, but it should be noted that there is a big difference between the two regions. For Monduli, in Mto wa Mbu the land is almost always irrigated, allowing for the planting of not only maize but also rice, bananas and sweet potatoes. The number of crops grown by the ten men farmers surveyed for this case study (see Table 2) reveals how diverse the area is in crop production. However, most of the men farmers we surveyed prefer to grow cash crops on a larger scale, with less retained for household consumption.

**Table 2. Percentages of cash crops sold by the ten men farmers surveyed**

Farmer #	Maize	Beans	Sunflower	Pigeon pea	Coffee	Cow pea	Rice	Sweet potato	Banana	Broccoli	Sweet pepper	Cauliflower	Eggplant	Watermelon	Pumpkin	Tomato	Butternut squash	Leaf cabbage	Tree seedlings	<i>Grevillea robusta</i>
1	80	85	100	90				50	80											
2	90			99	98	2				99		99			50		80			95
3	70	90	70						10							95		70		
4	95	95	90										95					90		
5	80	50							80											
6	60	50							90				80			90				
7	50	30					40		80				90			90				
8	70	90											95					95		
9	80															95				
10																		90	99	

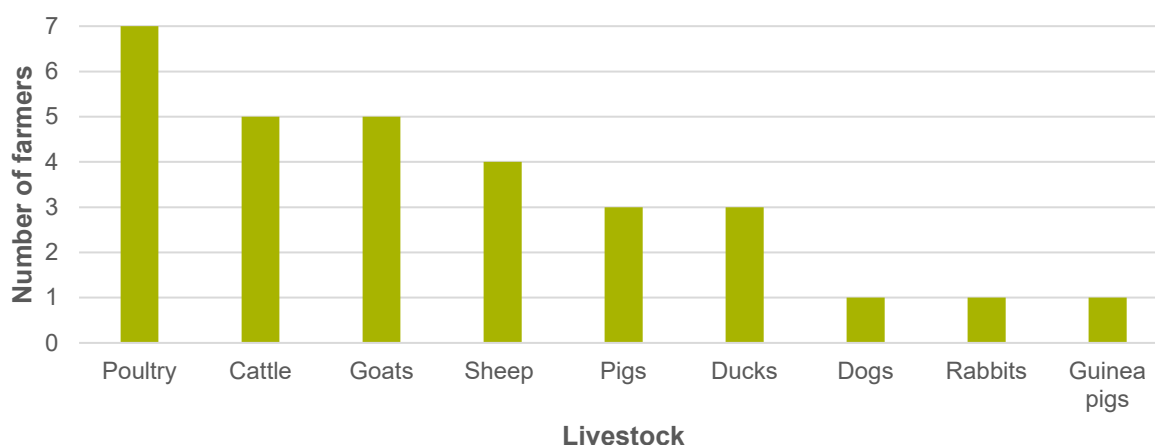
Many MVIWAARUSHA members raise livestock to sell, such as cows, sheep, goats and pigs. A farmer will not slaughter a cow just for household consumption, but it can be slaughtered for sale with a few kilos retained for his family. Sheep, goats and chickens are, however, slaughtered for household consumption because of their smaller size. These domesticated animals support MVIWAARUSHA's members economic and food security. Figure 5 shows the number of types of livestock reared and sold by the ten male-headed households surveyed. Poultry is the most popular type of livestock reared locally, followed by cattle, goat, sheep, and ducks.

**Figure 4. Livestock reared by one an MVIWAARUSHA member in Karatu**



Photo credit: Canisius John Kayombo

**Figure 5. Livestock animals reared by the ten men farmers surveyed**



The percentage of livestock that is sold (not consumed) is >75% for most of the men members surveyed (see Table 3). These results are unlikely to be indicative of the real situation, but rather a small snapshot of what is happening within the much larger landscape of MVIWAARUSHA members (more than 12,000). The number of types of animals domesticated seems to reflect the landscape where each member lives and the general patterns of land use and the size of farm. The members with very small amounts of land prefer smaller livestock animals that can be managed more easily within a small range of land and fewer feeding resources. Cattle need a huge amount of fodder, and sheep and goats somewhat less. Some smaller livestock animals can be fed on food waste (such as banana husks) or small bundles of grasses. These animals both provide an income when sold, support food security and health, and provide manure for agricultural crops.

**Table 3. Percentages of livestock sold by the ten men farmers surveyed**

Farmer #	Cattle	Goats	Pigs	Poultry	Sheep	Dogs	Ducks	Rabbits	Guinea pigs
1	100	90	90	90	90	100			
2	100				5				
3	80	100	100	50					
4			85						
5	70	70		70	80				
6				90			50		50
7				90			80	100	
8	50	50		80			80		
9		80			70				
10				70					

## 2.2 Cash crops grown by women

The ten women farmers of female-headed households surveyed also grow a variety of crops, although most women possess less land than men. Their crops provide them with money to pay for school fees for their children, to construct houses and to buy seeds when necessary for the next growing season.

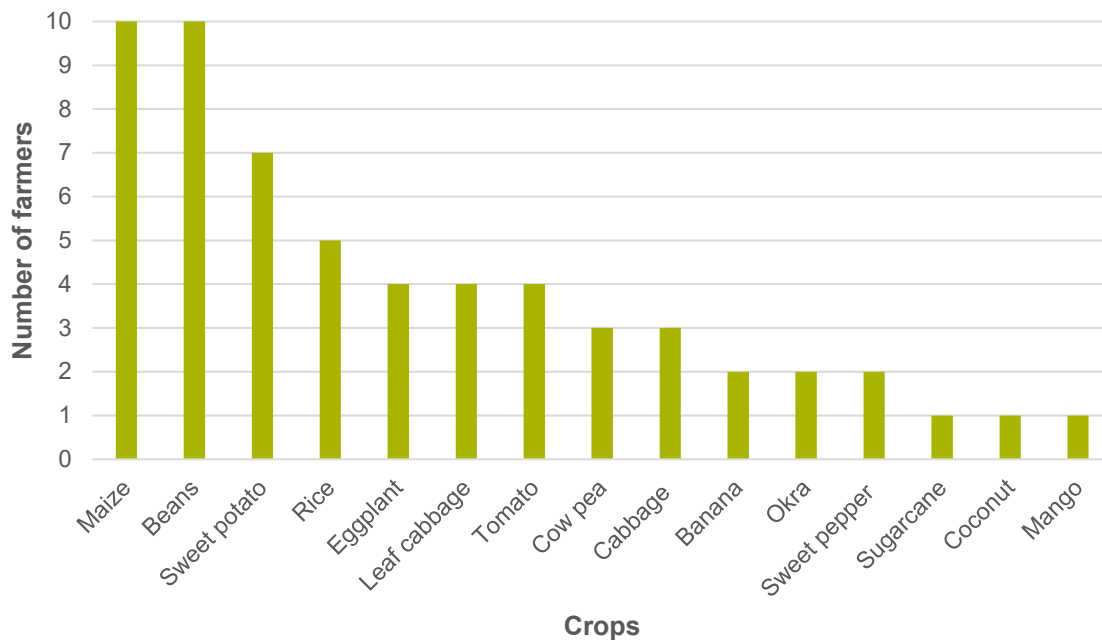
**Figure 6. Women maize farmers from Mto wa Mbu in Monduli district in the field weeding and checking for diseases that attack young maize, and at the local market selling their crops**



Photo credit: Canisius John Kayombo

Once again, the predominant crops grown by the women farmers surveyed are maize and beans, followed by sweet potato, rice, eggplant, leaf cabbage and tomato (see Figure 7). The most marketable and highest-priced crops are preferred by MVIWAARUSHA members, even though mixing with other crops is a priority as it provides some resilience if a particular crop fails. The women also grow grains, tubers, fruits and vegetables and at least more than half of these crops are sold (see Table 4).

**Figure 7. Cash crops grown by the ten women farmers surveyed**



**Table 4. Percentages of cash crops sold by the ten women farmers surveyed**

Farmer #	Maize	Beans	Rice	Cowpea	Sweet potato	Sugarcane	Coconut	Banana	Mango	Leaf cabbage	Eggplant	Tomato	Sweet pepper	Cabbage	Okra
1	75	85	90	20	5					98	95	98	5		
2	50	65	80		20					95	95	95	45		
3	60	50	75		45					96	90	95		35	
4	75	75	75	5										5	65
5	50	95	65	15	70	80			75	95	85	85		80	75
6	40	75			90			50							
7	50	80					10	50							
8	50	75													
9	80	80			90										
10	80	80			80										

Women members of MVIWAARUSHA are also involved in raising livestock animals but prefer those that can be easily managed close to the farm, including goats, sheet, ducks and poultry. Like the men, most of the animals are sold to earn cash to pay for children’s school fees and the rest is for household consumption.

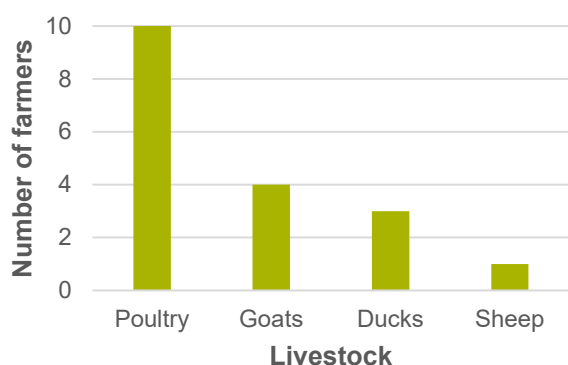
**Figure 8. Livestock reared by MVIWAARUSHA women members at Mto wa Mbu in Monduli district**



Photo credit: Canisius John Kayombo

The animal most frequently domesticated by the ten women farmers surveyed were chickens, followed by goats, ducks and sheep (see Figure 9). Chickens can be raised more easily than other types of livestock and also provide eggs and manure.

**Figure 9. Livestock animals reared by the ten women farmers surveyed**



Poultry and goats serve best for the combined purposes of sale and household consumption. Women seem to prefer rearing sheep in particular for household consumption, with only 10% of the sheep they reared being sold. Table 5 provides a snapshot of the animals domesticated by female-headed households, although such small sample size will not be indicative of the real situation for the full MVIWAARUSHA membership. However, the data are useful to indicate the predominant species domesticated — even if it misses the fact that some women also keep domestic cattle.

**Table 5. Percentages of livestock sold by the ten women farmers surveyed**

Farmer #	Goats	Poultry	Sheep	Ducks
1		85		95
2		90		
3		70	10	20
4	10	80		
5	50	95		
6	80	50		
7	80	50		10
8		50		
9		50		
10		50		

### 2.3 Subsistence crops grown by men

Most subsistence crops are the same crops that are sold at markets, including those which are mostly for household consumption. Most men concentrate on growing cash crops, but certain amounts are retained for subsistence (see Table 6).

In terms of livestock, some of the animals reared by male-headed households are retained for home consumption, although to differing degrees. Larger animals such as cattle are used less for subsistence purposes, while smaller animals such as goats and chickens are used more.

**Table 6. Subsistence crops grown by the ten men farmers surveyed**

Farmer #	Maize	Beans	Cowpea	Sweet potato	Cassava	Coconut	Mango	Banana	Amaranth	Mnafu	Cabbage	Leaf cabbage	Sunga
1	x	x		x					x	x		x	x
2	x	x	x	x					x	x		x	x
3	x	x		x	x				x	x	x	x	x
4	x	x		x					x	x	x	x	x
5	x	x		x	x				x	x		x	x
6	x	x		x	x	x	x	x	x	x		x	x

Farmer #	Maize	Beans	Cowpea	Sweet potato	Cassava	Coconut	Mango	Banana	Amaranth	Mnafu	Cabbage	Leaf cabbage	Sunga
7	x	x		x	x			x	x	x		x	x
8	x	x		x				x	x	x		x	x
9	x	x		x				x	x	x		x	x
10	x	x		x				x	x	x		x	x

## 2.4 Subsistence crops grown by women

All agricultural crops known to be grown by the ten female households (see Table 7) are also used as subsistence crops. Vegetables are mostly kept for home consumption, including sunga, amaranth, and cassava. These crops significantly support the livelihoods of the women MVIWAARUSHA members in the landscapes of Karatu and Monduli districts, even though this data offers just a narrow picture of the facts on the ground.

**Table 7. Subsistence crops grown by the ten women farmers surveyed**

Farmer #	Maize	Beans	Cowpeas	Sweet potato	Cassava	Sunga	Cabbage	Amaranth	Mnafu
1	x	x	x	x					x
2	x	x		x					x
3	x	x		x		x	x		x
4	x	x		x		x	x		x
5	x	x	x	x		x			x
6	x	x		x		x			x
7	x	x		x		x			x
8	x	x		x		x			x
9	x	x		x		x			x
10	x	x		x		x			x

## 2.5 Wild products harvested by men

A certain number of plants are known to be harvested by men from the wild, including plants used as food (fruits and vegetables), medicine, firewood and timber (see Table 8). Fewer plant species are collected from the wild by men than by women. These plants are often found on both private farms (where the remnants of Indigenous trees are left to grow alongside cultivated trees such as the widely planted *Grevillea robusta*, a rapidly growing shelter and timber tree) and on communal or village land. Around the NCAA areas, this is not strictly possible because the land is under total protection rules. Local people also harvest plant materials from village authority land and homestead woodlots.

The only wild fauna known to be collected by male-headed households are fish from Lake Manyara (tilapia and catfish) and from streams (catfish).

**Table 8. Uses of wild products harvested by the ten men farmers surveyed**

Botanical name	Common/Local name	Food	Fibres	Construction	Medicine	Cosmetics	Preserving	Firewood	Bee fodder	Fodder
<i>Albizia gummifera</i>	Mfuruanji							X	X	
<i>Aloe secundiflora</i>	Mshubiri/Mlovera		X		X					
<i>Balanites aegyptiaca</i>	Mduguyu	X								
<i>Carissa edulis</i>	Mkarisa				X				X	
<i>Cleome hirta</i>	Mgagani	X								X
<i>Cordia Africana</i>	Mringaringa			X						
<i>Euclea divinorum</i>	Osojo				X	X		X		
<i>Ficus sur</i>	Mkuyu/Oreteti	X					X			
<i>Ficus sycomorus</i>	Mkuyu/Oreteti	X					X			
<i>Rauvolfia caffra</i>	Msesewe			X	X		X			
<i>Solanum nigrum</i>	Mnafu	X								X
<i>Vangueria madagascariensis</i>	Ergumii/Emardanyii	X			X			X	X	
<i>Ximenia caffra</i>	Armai	X								

## 2.6 Wild products harvested by women

Wild plant crops known to be harvested by female-headed households are collected for numerous uses (see Table 9). No wild fauna species were revealed to be harvested by the women surveyed.

**Table 9. Uses of wild products harvested by the ten women farmers surveyed**

Botanical name	Common/Local name	Food	Medicine	Firewood	Cosmetics	Bee fodder	Water catchment protection	Fodder
<i>Adansinia digitata</i>	Baobab/Mbuyu	X						
<i>Albizia gummifera</i>	Mfuruanji			X				
<i>Aloe secundiflora</i>	Mshubiri	X						
<i>Capsicum frutescens</i>	Pilipili kichaa	X						
<i>Carissa edulis</i>	Olamoriaki		X			X		
<i>Cleome hirta</i>	Mgagani	X						
<i>Cordia Africana</i>	Mringaringa			X				
<i>Ehretia cymosa</i>	-			X		X	X	
<i>Euclea divinorum</i>	Osojo				X			
<i>Galinsoga parviflora</i>	Olikisiko	X						X
<i>Ipomoea aquatica</i>	Kiazi kitamu pori							
<i>Solanum nigrum</i>	Mnafu	X				X		
<i>Sonchus schweinfurthii</i>	Sunga/Mchungu	X						
<i>Tamarindus indica</i>	Tamarind/Ukwaju							
<i>Thespesia garkeana</i>	Matogwa	X						
<i>Vangueria madagascariensis</i>	Ergumii	X		X		X		
<i>Ximenia caffra</i>	Armai	X				X		

## 2.7 Crops varieties

MVIWAARUSHA members keep a high number of local varieties of crops that are used for generating financial income and household consumption (subsistence). Some crops are deliberately

distinguished and maintained on farms and in the forest. MVIWAARUSHA has made recent efforts to establish community seed banks to maintain these varieties (such as maize, beans and many other crops — see Table 10). Some varieties of tree are not only found in the forest but also occur together with agricultural crops, and are retained during clearing for farming. Some plants grow as weeds (such as *Galinsoga parviflora*) but are also useful as both a vegetable and for livestock fodder.

**Table 10. Uses of commercial and subsistence plants grown by MVIWAARUSHA members**

Botanical name	Common/Local name	Food	Medicine	Bee fodder	Water catchment protection	Boundaries	Ornamental	Timber	Firewood	Beverages
<i>Acacia seyal</i>	Mgunga				x					
<i>Acacia xanthophloea</i>	Mgunga				x					
<i>Adansonia digitata</i>	Mbuyu	x	x	x						
<i>Albizia gummifera</i>	Mfuruanji			x				x	x	
<i>Aloe secundiflora</i>	Mshubiri		x							
<i>Amaranthus hybridus</i>	Mchicha	x								
<i>Balanites aegyptiaca</i>	Mduguyu		x	x						
<i>Capsicum frutescens</i>	Pilipili kichaa	x	x							
<i>Cleome hirta</i>	Mgagani	x								
<i>Coffea arabica</i>	Coffee			x					x	x
<i>Cordia africana</i>	Mringaringa			x			x	x		
<i>Euphorbia nyikae</i>	Mlangali	x				x				
<i>Ficus sur</i>	Mkuyu/Oreteti	x			x					
<i>Ficus sycomorus</i>	Mkuyu/Oreteti	x			x					
<i>Galinsoga parviflora</i>	Olekisiko	x								
<i>Ipomoea batatas</i>	Sweet potato									
<i>Ipomoea aquatica</i>	Kiazi kitamu pori									
<i>Manihot esculenta</i>	Cassava	x								
<i>Prosopis juliflora</i>	Mesquite	x		x					x	
<i>Psidium guajava</i>	Mpera	x	x						x	
<i>Rauvolfia caffra</i>	Msesewe		x		x		x	x		
<i>Solanum nigrum</i>	Mnafu	x								
<i>Sonchus schweinfurthii</i>	Mchungu/Sunga	x	x							
<i>Vangueria madagascariensis</i>	Ergumii/Emardanyii	x	x						x	
<i>Ximenia caffra</i>	Armai/Lamai			x						
<i>Zea mays</i>	Maize	x		x						

### 3. Crop cultivation and rearing livestock: knowledge sources

#### 3.1 Biocultural heritage

Local communities eat both plants found on their farms and in the wild. Most prefer to grow plant materials such as maize, beans and many vegetables without applying artificial fertilisers. Plant materials and livestock manure are generally used to fertilise farms. Some members fertilise poor-performing agricultural crops with wood ash or, in a couple of cases, with slurry from biogas generators recently installed by MVIWAARUSHA. Communities tend to store any seed kept for planting as next year's crops in their kitchens, as smoke from cooking fires helps to preserve the seed. Local foods and medicine are widely used and often preferred to modern medicines, including honey. Honey production is widely understood to sustain vegetation and protect crops from wild animal damage, including elephants in the Karatu region near Ngorogoro. Some natural products including honey have traditionally been processed/packaged and sold, and this practice has now advanced with support from MVIWAARUSHA.

**Figure 10. Communities produce and sell natural products such as honey, and traditional fabrics made from cotton or other natural fibres**

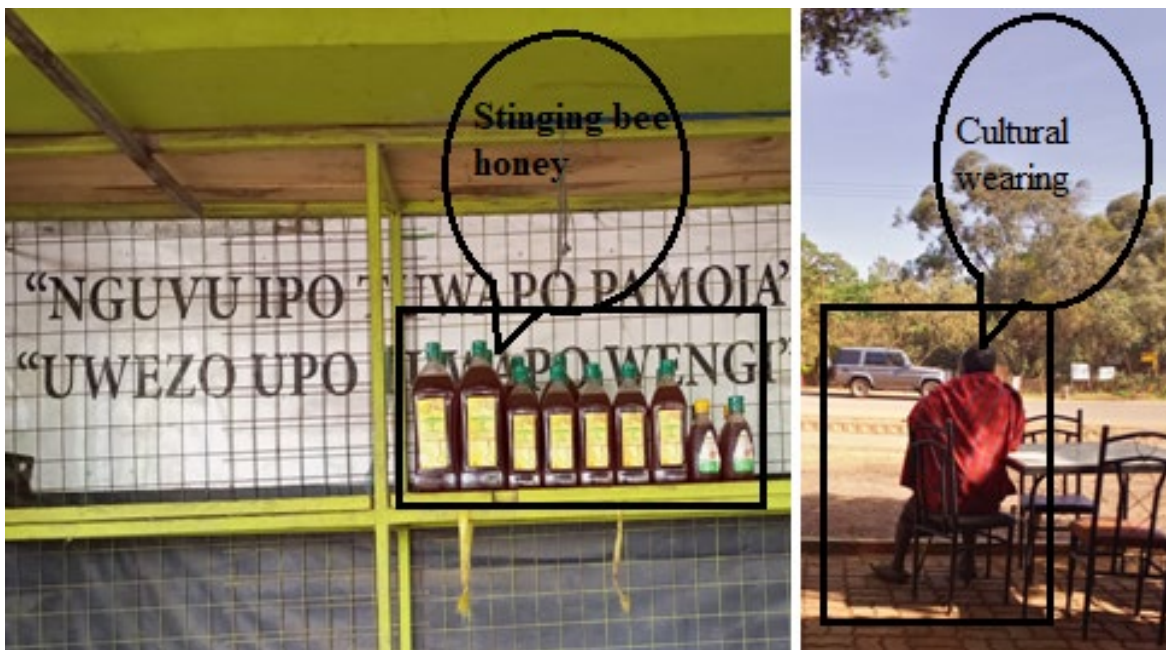


Photo credit: Canisius John Kayombo

Agrobiodiversity is seen as one way of maintaining yields of agricultural crops and livestock. The practice sustains natural vegetation patches as wildlife habitats, which can also encourage on-farm tourism.

**Figure 11. A chameleon observed in a vegetation patch near an MVIWAARUSHA member's house**



Photo credit: Canisius John Kayombo

### 3.2 Intergenerational knowledge transfer within households

Most knowledge about plant and animal cultivation and management is transferred from grandparents, parents and neighbours to younger generations from childhood through practice and informal teachings. Over time, knowledge is handed down, either through learning by doing, through media such as television and radio, or by other means including seminars, workshops and short- and long-term education. However, this system is being eroded by the expansion of technology and also because children now spend less time with their parents and more time in school. However, media can also be important in terms of building awareness of new types of seed and animals from outside and how to manage them.

**Figure 12. At one of the MVIWAARUSHA member's homesteads**



Photo credit: Canisius John Kayombo

### 3.3 Knowledge transfer between neighbours

Farmers often rely on their neighbours and tend to watch and practice what their more successful neighbours do. People seem to learn more easily when they see a neighbour's successes — even more than being educated by technical experts from outside. Sitting in buildings for formal trainings with a lot of theoretical material is largely seen as inappropriate given many farmers cannot read and have no time to take part. Instead, they prefer to put into practice what they learn from their neighbours. For example, many local farmers who cultivate and store traditional crop varieties and pass on this knowledge to other farmers (such as varieties that stand out for taste or are resistant to drought or pests).

In areas where MVIWAARUSHA operates, there have been many changes, especially in tree planting. Public media and even institutions such as schools invite MVIWAARUSHA members to plant trees for them. This increases agrobiodiversity as areas with more trees have minimal soil erosion,

better-regulated temperatures and better soil quality, which is seen as an ecologically attractive practice. It also helps to generate new streams of income for members.

### 3.4 Organisational knowledge networks

As a member-based organisation, the collective knowledge of both nutrition and plant and animal cultivation and management is shared across the membership. MVIWAARUSHA has expanded its members' knowledge and experience in the following key ways.

- **Peer-to-peer learning:** MVIWAARUSHA has encouraged peer-to-peer learning within its local groups and networks, including seed and market fairs where their members can display their products, meet and share ideas with each other. For example, in 2021 representatives of local groups participated in a farming show during the Nane Nane show in Arusha city, where members' products were sold and publicised for their quality.<sup>2</sup>
- **External support:** MVIWAARUSHA's visibility has attracted external support from organisations such as the Forest and Farm Facility (FFF). For example, few members used biogas plants (an anaerobic digester that turns farm waste or energy crops into fuel) but with training and financial support, their adoption of this system is gradually expanding. New knowledge on agroecology, entrepreneurship, marketing, finance, and laws and policies have been introduced to members through a wide range of projects with partners, including FAO and IIED in the FFF, as well as the Belgian agri-agency Trias, the Swedish agri-agency WeEffect, the Belgian organisation Iles de Paix, the Andreas Hermes Akademie and many others.
- **Staff professionalism:** the staff at MVIWAARUSHA's headquarters provide its members with professional services, such as finding new markets for agricultural products such as honey and sunflower oil that are sold right at the MVIWAARUSHA office in Mto wa Mbu. Staff have also been upskilled through external support from FFF and other organisations that provide training through farmer field schools or training-of-trainers approaches.
- **Training programmes:** many hundreds of members have been trained in topics such as entrepreneurship using the German Bäuerliche Unternehmer Schulungen (BUS — meaning 'farm entrepreneur training') agribusiness training tool, on how to mix annual food crops with trees (agroforestry), raising trees seedlings (nurseries), tree planting, community seed banks, poultry rearing and the use of livestock waste to make biogas. The entrepreneurship trainings are now in their seventh year with initial support from the Andreas Hermes Akademie of the German Farmers' Association. Each local farmers' group have had least one member (usually the leader) trained by MVIWAARUSHA in a variety of topics such climate change impact mitigation and coping strategies. This has helped members to plant a variety of crops including those which are drought resistant and to keep livestock that can offer manure, skins, meat and provide a financial income.
- **Media communications:** external communications have improved hugely. For example, Radio Tap is a radio programme run by Farm Radio International Tanzania that records useful farming information for the Tanzania Broadcasting Corporation. MVIWAARUSHA members listen to the programmes, discuss what they have learnt and then put it into practice, such as how to manufacture organic manure.
- **Financial services:** MVIWAARUSHA has invested heavily in establishing microcredit facilities or SACCOs for almost all of its members' groups as well microcredit services that allow member groups or individuals to borrow up to three times their combined savings. This has greatly improved access to finance in support of agriculture and livestock business development.

---

<sup>2</sup> In Tanzania, Nane Nane (meaning 'eight eight' in Swahili) is a public holiday. Also known as Farmers' Day, Nane Nane takes place on 8 August each year.

## 4. Cultivating and managing seed and animal resources

How MVIWAARUSHA members source their seed depends on the purpose of planting, the availability of seed (such as seed kept from the previous harvest), and the prices and availability of external seed sources and what farmers can afford to pay, as many smallholder farmers either cannot save money or seed in drought years. Some members buy seed from commercial farm shops or from fellow MVIWAARUSHA members or neighbours.

From the interviews in this case study, four of the 20 farmers revealed that they buy some seed from farm shops run by agricultural input firms and other privately licensed businesses in Arusha city or from smaller privately licensed shop owners around Karatu town. Almost all of the farmers surveyed buy seed from other MVIWAARUSHA members. Members buy livestock such as goats and cattle either from local auctions or their neighbours.

### 4.1 Self-provisioning and multiplication of seed

From the interviews for this case study, 10–20% of the seed and animal offspring comes from the farmer's own stocks or from seed multiplication. The rest is sourced from neighbours, farm shops or auctions.

To ensure that diversity is maintained, MVIWAARUSHA is encouraging members to plant or maintain trees that can generate fruits, firewood and livestock fodder at their homestead (as zero grazing is encouraged).<sup>3</sup> Farmers have always protected some of the more important Indigenous trees both on and outside of their farms, but are now increasing this practice following MVIWAARUSHA's awareness-raising activities about the impacts and causes of climate change.

**Figure 13. Zero grazing practiced by MVIWAARUSHA members**



Photo credit: Canisius John Kayombo

### 4.2 Bartering for and purchasing seed

More than 60% of seed/animal offspring is sourced from informal social networks of neighbouring farmers and MVIWAARUSHA members regularly share information among themselves about available agricultural crops or animal resources. Rather than bartering for and exchanging seeds and livestock, most are sold for cash. The bartering system rarely works, usually because two parties rarely have exactly what each other wants, although it does happen occasionally.

Local seed that is either purchased or bartered for can enhance agrobiodiversity because it helps to maintain or enhance local varieties, whereas seed cannot be multiplied from hybrid varieties as they do not set viable seeds (leading some farmers to exploit wild resources such as charcoal or timber to generate a source of income, which in turn degrades local agrobiodiversity).

---

<sup>3</sup> MVIWAARUSHA encourages zero grazing as it allows for the collection of animal waste to be converted into biogas fuel while also reducing damage to vegetation caused by roaming livestock.

### 4.3 Formal purchasing systems and community seed banks

MVIWAARUSHA has helped to develop local microfinance systems that enable farmers to purchase seeds and livestock. Through different projects, it also offers tree seedlings, piglets, bananas and sweet potatoes.

A crucial recent set of interventions have led to the establishment of five community seed banks with support from Iles de Paix. Farmer groups have been sensitised to the need to maintain hardy and unusual varieties of a whole range of local crops. Members provide small demonstration pots of seedlings for display at their local community seed banks with a record of their contribution. The community seed banks also maintain larger seed selections of key crops that can be purchased either by members or external buyers. Members can also use seed from the seed bank, provided they replace the same quantity from that year's harvest. If there is insufficient seed in stock, the leader of the community seed bank can direct any buyer to MVIWAARUSHA members who are known to have seed of that variety available for sale.

At present, the commercial activities of the community seed banks are constrained by a law that prohibits local farmers from selling traditional varieties of seed to the open market. However, the community seed bank groups with MVIWAARUSHA and its broader allies (including Shiwakuta, the National Federation of Smallholders Farmers' Associations in Tanzania) are currently lobbying for this law to be changed.

**Figure 14. A community seed bank near Karatu, run by MVIWAARUSHA members**



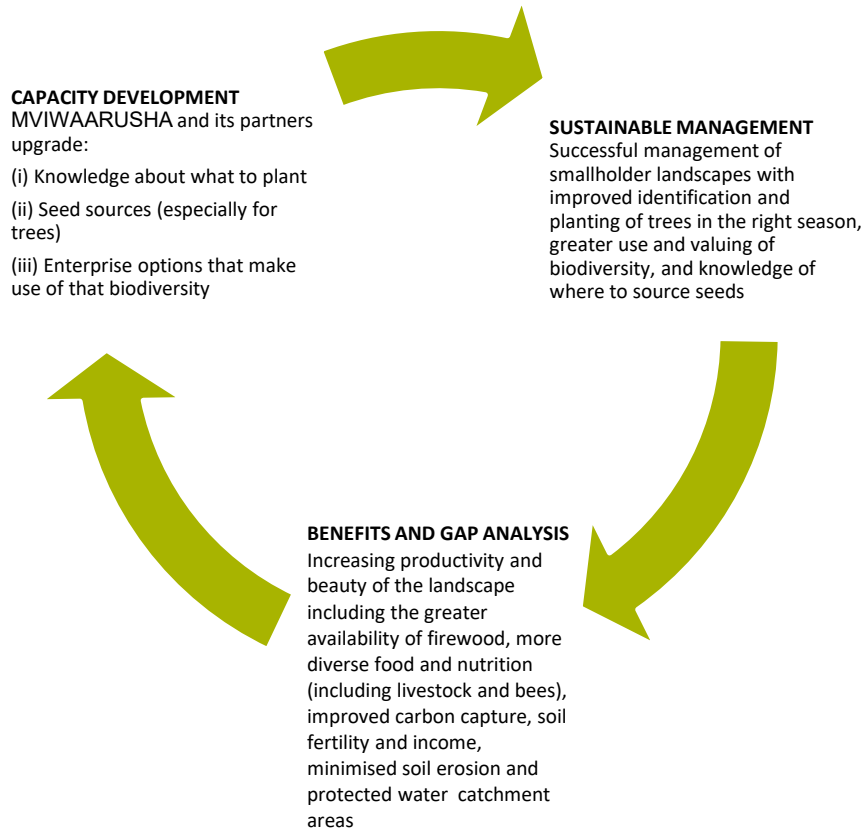
Photo credit: Canisius John Kayombo

Additionally, and with FFF support, since 2022 MVIWAARUSHA has helped many of its local groups to establish commercial tree nurseries. Nursery bags have been provided alongside technical training that has included training in grafting. Members either sell trees locally at a range of prices (including high-yielding grafted fruit trees) or through MVIWAARUSHA programmes on tree planting and landscape restoration. Several tree seedling varieties are also being sold to individuals and schools including popular options such as: *Grevillea robusta*, *Markhamia lutea*, *Persea americana* (avocado), *Psidium guajava* (guava) and *Sesbania sesban*. Seed sources for trees are collected from local orchards, farms and woodlots or are sometimes bought from external orchards.

As part of its drive to educate its members on the need to maintain on-farm agrobiodiversity, MVIWAARUSHA ensures that it communicates with and advises its members on when trainings and performance surveys are available to participate in. MVIWAARUSHA prepares members to be ready to receive external support from organisations such as Farm Radio International Tanzania. These organisations provide capacity development on for example how to identify types of plant or animals, when best to plant trees to ensure survival, areas to be planted (farms, water catchment areas, homesteads, avenues), the value and benefits of different varieties of tree or crops (such as for food, livestock fodder, nitrogen fixing, firewood), where to source seeds (locally among members or from outside the community), how to obtain seed (using loans, cash, bartering or for free) and other elements of business development from those trees (see Figure 15). For example, Farm Radio International in Tanzania supported two MVIWAARUSHA groups in Karatu district (Eden and Ebeneza groups) by supplying banana transplants. These are now being grown on smallholder farms. This was unexpected as bananas were not previously considered as suitable for growing in this area.

MVIWAARUSHA aims to promote sustainable management of the landscape so that it can meet today's needs with jeopardising the needs of future generations. This will lead to benefits such as improved natural beauty, the availability of energy resources (firewood), food, livestock and bee fodder, improved carbon sequestration, climate regulation, soil quality and economic income, and minimising soil erosion. A gap analysis for additional benefits can lead to further capacity development by MVIWAARUSHA.

**Figure 15. How MVIWAARUSHA promotes sustainable resource management in Karatu and Monduli**



## 5. Enterprise strategies and agrobiodiversity

### 5.1 Cash-crop enterprises

The production of commercial crops can enhance agrobiodiversity if carefully planned. Planting crops such as coffee together with Indigenous or local trees and cover crops can enhance agrobiodiversity, for example. On the other hand, expanding monocultures or using shifting cultivation in areas too small to allow for fields to lie fallow, or using chemicals to uplift harvests, will almost always diminish agrobiodiversity on farms. Intensive production can lead to clearing of natural vegetation for crops such as maize and beans — and this can reduce biodiversity and exacerbate climate change because it also removes carbon sinks.

MVIWAARUSHA members are committed to agroforestry, cover-crop farming and zero grazing livestock farming. The most common tree crops in the predominant maize and bean agroforestry systems are species such as banana and *Grevillea robusta* and *Cordia africana* (for timber). Of the 20 respondents, only one farmer was growing Arabica coffee as his main agroforestry crop within which trees such as *Acacia albida*, *Albizia gummifera*, *Cordia africana*, *Croton macrostachyus*, *Vangueria madagascariensis* were identified. MVIWAARUSHA is actively exploring marketing opportunities for a wider variety of agricultural and tree crops by sending representatives to market shows such as Nane Nane in Arusha city to discuss what buyers want. Furthermore, the Kilimo Endelevu show in Karatu in 2020 was positively supported by MVIWAARUSHA. This has helped link smallholder farmers to local markets and other consumers such as tourists who visit the NCAA. MVIWAARUSHA also helps members aggregate crops for sale at farmer markets and shows.

### 5.2 Changing patterns of cash cropping

Most farmers in MVIWAARUSHA revealed that the quantities of maize and beans they sell has declined in terms of kilos harvested. However, the quality is higher and attracts customers more easily. Because diversification is encouraged, the range of products being sold have changed significantly over time. Now if one crop fails, there are others to replace it.

### 5.3 MVIWAARUSHA's role in shaping what is sold

MVIWAARUSHA is currently conducting market research for a number of its member's products. As noted above, MVIWAARUSHA also has a very active entrepreneurship programme and has offered training on value addition for a variety of products. For example, it has made particular progress in adding value to products through processing training on sunflower oil and honey production. Farmers have been supported to find suitable materials to package and label their products so they can be sold at the roadside shop owned by MVIWAARUSHA.

New honey associations and nursery seedling associations have also been formed. Through such associations, honey can be aggregated from multiple members and sold to markets under a single branded label. The honey is currently sold within Karatu and Monduli districts, but some external buyers have also made purchases, including wholesale buyers in Arusha City and in other regions. The smallholder farmers who are members of the honey associations believe that in time their honey could also be exported. MVIWAARUSHA is encouraging beekeeping because it helps to expand the volumes of honey that can be traded and is also an ecologically friendly income-generating intervention. It is also planning to offer beehives to other groups starting with Monduli district to enhance production for both local and eventually international markets.

The external networks or contacts managed by MVIWAARUSHA have offered education and tangible materials that have helped expand its members' options as to what they can cultivate and sell. For example, training on tree planting has shaped what trees are being sold and planted commercially. Growing fruit trees such as *Carica papaya* (papaya), *Annona reticulata* (bullock's heart), *Punica granatum* (pomegranate) and *Citrus lemon* (lemon) opens up possible future market opportunities.

MVIWAARUSHA trainings on tree nursery production have also opened up new sales of trees for firewood, timber, fruit, shade, wind breaks, nitrogen fixing and climate regulation. The 20 farmers surveyed for this case study described how MVIWAARUSHA training had led to further

demonstrations in schools (primary and secondary schools) with trainers capable of explaining and demonstrating tree planting in Karatu district. This will lead to having more diversified crops for sale. Environmentally friendly farming systems are also emerging that are shaping the types and scale of crops sold (for example, mixed maize, beans or coffee agroforestry systems with intercropped vegetables, beekeeping and zero-grazed cattle for dairy products).

## 5.4 Future plans

One of MVIWAARUSHA's future strategy is to prepare a documentary on the cultural knowledge used to produce and preserve crops, and how to protect natural vegetation. This documentary will teach people how to use traditional methods to treat crops such as using wood ash to discourage insects that feed on agricultural crops.

In terms of developing climate-resilient business, MVIWAARUSHA is looking at alternative approaches to cope with the impacts of climate change, such as the use of drought-resistant crops including *Manihot esculenta* (cassava) and local maize seeds, planting trees to regulate climate, applying cover-crop methods, and producing biogas from livestock waste.

MVIWAARUSHA is also contemplating establishing a business unit or trading arm to work alongside its member-based association and act as a product aggregator and value-addition service for its members. This will improve market access to major towns and other higher-value markets.

## 6. Finance strategies for diversified production

### 6.1 Internal finance mechanism

MVIWAARUSHA facilitates access to finance for its members, many of whom lack access to conventional banking services, by coordinating a network of SACCOs and community microfinance groups (CMGs).

MVIWAARUSHA's SACCOs, which are formalised groups and regulated under the Microfinance Act No. 10 of 2018, provide a range of financial services and products to support members, including the sale of shares, savings facilities and access to affordable loans. The first two SACCOs were established in 2005, when MVIWAARUSHA realised its members were struggling to access credit.

Since then, six more SACCOs have been progressively established across the districts of Arusha DC, Monduli, Karatu and Longido, responding to the evolving needs of smallholder farmers (see Table 11 for list of MVIWAARUSHA's eight SACCOs). This staggered formation process allowed MVIWAARUSHA to expand financial services progressively in response to increasing demand and the unique needs of its members. MVIWAARUSHA continues to serve as the coordinating body, ensuring alignment with member needs and organisational objectives, while supporting the SACCOs in complying with legal and financial regulations. All SACCOs are organised under MVIWAARUSHA's local networks and members of MVIWAARUSHA are also members of these SACCOs, ensuring a strong and direct link between the farmer organisation and the financial cooperatives. Notably, MVIWAKA SACCO stands out as the only district network SACCO. Unlike the other seven SACCOs, which operate at a local network level within their respective wards or villages, MVIWAKA SACCO brings together all nine local farmer networks across Karatu district into one consolidated financial institution. This structure enhances coordination and allows for collective action on financial matters affecting members within the district.

The SACCOs operate with a well-defined governance structure that promotes inclusivity and member participation. SACCO leaders meet quarterly to oversee operations and review performance, while sub-committees responsible for specific operational areas meet monthly to address day-to-day management issues and loan approvals. All SACCO members also convene once a year during their annual general meetings (AGMs), where key decisions are made, financial reports are reviewed, and leadership positions are confirmed. This interactive structure ensures regular communication, accountability and operational efficiency.

By providing organisational development support, MVIWAARUSHA helps to enhance the operational systems, policies and structures of SACCOs. To strengthen financial sustainability and help minimise the risk of loan defaults, MVIWAARUSHA also provides continuous business support services including:

- Capacity building and training for SACCO leaders and members in financial management, recordkeeping and loan administration
- Coaching and mentorship on cooperative governance and business operations
- Financial monitoring and periodic evaluations to track SACCO performance and identify areas for improvement, and
- Support in business plan development for both the SACCOs and individual members seeking loans for agricultural and non-farm enterprises.

Collectively, the eight SACCOs manage just over 357.5 million Tanzanian shillings (approximately US\$135,550)<sup>4</sup> in total assets, with nearly 312 million Tanzanian shillings (approximately US\$118,100) in outstanding loans, just over 175 million Tanzanian shillings (approximately US\$66,340) in member savings, and a combined capital of over 144 million Tanzanian shillings (approximately US\$54,692). The network serves a total of 646 individual members: 306 women, 267 men and 162 groups representing an additional 4,051 individual members.

---

<sup>4</sup> All US\$ figures estimated based on the average exchange rate over the last 12 months.

MVIWAKA SACCO in Karatu leads in asset base and loan portfolio, while others such as MVIWAENGU, MVIWABU and KIPOK demonstrate steady growth in loan services for smallholder farmers. This financial mobilisation has expanded access to affordable credit, strengthened farmer resilience and promoted sustainable rural livelihoods through community-driven savings and credit systems.

An analysis of the portfolio at risk (PAR >30 days) reveals varying levels of loan performance, with an overall average PAR of 14.3% (see Table 11). Notably, MVIWAKA in Karatu maintained the healthiest portfolio with a low PAR of 2.7%, while MVIWABU in Monduli recorded the highest risk at 45.8%. MVIWABU's high PAR is linked to specific challenges, including leadership issues, climate-related production losses, poor recordkeeping and limited financial literacy. MVIWAARUSHA is providing support to MVIWABU to address these issues through targeted training, improved loan-monitoring systems and the introduction of technologies to strengthen information management. Most other SACCOS, including MVIWAENGU MANANA, and KOMOLONIK, reflect moderate risk levels (24%, 11% and 9.2% PAR respectively). Encouragingly, MVIWAEKE, MVIWAIMBI and KIPOK (6.4%, 7.3% and 8.3% PAR respectively) maintained relatively manageable risk rates. The learning here highlights the importance of continuous capacity building in credit-risk management, stronger follow-up mechanisms, and borrower support systems, particularly for SACCOS with higher PAR, to safeguard the sustainability of these community-led financial initiatives.

Over the years, MVIWAARUSHA recognised that many of its members lived too far from the nearest SACCO, making access difficult. To address this and better reach producer groups at the community level, MVIWAARUSHA began training members to establish community microfinance groups (CMGs). CMGs are informal community-based financial groups, typically comprising 25–30 members. These groups operate on trust and mutual guarantee, pooling member savings and offering small, low-interest loans for farming, small businesses and emergencies.

MVIWAARUSHA began linking CMGs and SACCOS, enabling CMGs to join SACCOS as members. Through these partnerships, CMGs deposit savings into the SACCOS and can access loans up to three times the amount they have saved. The group loan is later disbursed among the CMG's members through their own agreements. Due to the strong cohesion and trust among the group members, the timely repayment of loans from the CMGs has been higher than individual loans to non-CMG members (Hou Jones et al. 2024).

This collaboration has delivered significant benefits for both parties. CMGs gain access to larger loans than they could otherwise obtain, while SACCOS expand their membership base and strengthen their overall financial performance.

Through CMGs, MVIWAARUSHA has significantly expanded financial inclusion and economic opportunities for smallholder farmers across the Arusha region. A total of 213 CMGs, comprising approximately 4,196 members (882 men and 3,314 women) are actively supported. The CMGs collectively managed an average savings of 506,250,050 Tanzanian shillings (US\$191,810) per cycle and by 2024 had disbursed loans totalling 598,728,000 Tanzanian shillings (US\$226,850).

**Table 11. Financial and membership data of MVIWAARUSHA's SACCOs (in Tanzanian shillings)**

District	SACCO name	Shares	Savings	Outstanding loans	Total assets	Total capital	PAR> 30 days	Members	Female	Male	Groups
Arusha DC	MVIWAENGU	2,600,000	23,675,000	39,935,600	65,703,304	35,100,000	24%	55	22	25	27
Monduli	MVIWABU	2,611,000	10,044,700	18,801,000	29,230,868	22,611,000	45.8%	54	28	23	27
Arusha DC	MVIWAEKE	2,290,000	9,469,000	14,573,000	24,267,471	9,790,000	6.4%	56	32	13	18
Arusha DC	MVIWAIMBI	4,535,000	11,456,400	19,079,850	30,572,791	9,535,000	7.3%	72	42	24	31
Karatu	MVIWAKA	9,373,000	85,330,176	146,815,188	137,074,757	34,373,000	2.7%	196	85	82	39
Longido	KIPOK	5,165,000	14,924,000	40,953,000	32,358,133	17,665,000	8.3%	115	54	58	26
Monduli	KOMOLONIK	3,966,700	13,172,500	18,214,869	23,593,902	13,616,700	9.2%	57	23	27	24
Monduli	MANANA	1,660,000	7,021,000	13,375,050	14,772,350	1,660,000	11%	41	20	15	21
	<b>TOTAL</b>	<b>32,200,700</b>	<b>175,092,776</b>	<b>311,747,557</b>	<b>357,573,580</b>	<b>144,350,700</b>	<b>14.3%</b>	<b>646</b>	<b>306</b>	<b>267</b>	<b>213</b>

## 6.2 Financial services that support agrobiodiversity

SACCOs provide a range of financial services and products to members, including the sale of shares, savings facilities and access to affordable loans. Loan types include individual farming business loans to support agricultural activities, group loans provided to CMGs, poultry loans to boost small-scale livestock farming and beekeepers' loans to support ecological beekeeping enterprises, promoting both income generation and environmental conservation, as well as emergency loans for urgent financial needs, and dedicated loans for women and youth to empower marginalised groups economically.

In addition, SACCOs also provide specialised agroecological loans with a flexible repayment period of up to 10 months. These loans are designed to empower smallholder farmers to engage in activities that promote sustainable and resilient farming systems while safeguarding household economies.

To access these loans, farmers must be active members of a SACCO, which has at least 25–30 members who collectively guarantee loan security, hold shares and contribute savings. Importantly, to encourage sustainable and agroecological farming, specific incentives are offered such as lower interest rates for agroecological ventures, easier loan access procedures, grace periods of up to six months, and group-based self-insurance systems. Members also benefit from tailored training, market opportunities and priority in future loan cycles, creating a supportive environment that promotes both financial inclusion and the adoption of climate-resilient, agroecological practices.

SACCOs maintain low loan fees of just 0.5% and offer competitive interest rates of 6% per annum specifically for farming loans, which is significantly lower than commercial banks (22% at the Cooperative and Rural Development Bank) and microfinance lenders (>12%).

A significant use of these loans is to reintroduce and cultivate forgotten or neglected local crops, such as traditional maize varieties, which hold cultural, nutritional and ecological value under the farmer-managed seed system (FMSS). In addition, the loans enable farmers to experiment with improved traditional farming practices, to test locally adapted seeds and to adopt innovative agroecological techniques such as intercropping, organic soil enrichment and water-harvesting methods. By providing accessible, purpose-driven credit from revolving funds (see Section 6.3) with a reduced interest rate, SACCOs decrease the financial risks typically associated with trying new crops or production systems, thereby broadening the range of crops cultivated and contributing to greater on-farm agrobiodiversity.

A total of 49 agroecological small and medium enterprises (SMEs) have been successfully linked to MVIWAARUSHA's network of SACCOs, providing them with access to SACCO services, including loans. Among these, 17 SMEs secured loans specifically aimed at improving the processing of agrobiological products. Notable examples include Pambazuko Enterprise, which specialises in producing local maize flour (Unga wa Lishe), and Nichez Products, which processes chilli pepper and tomato ketchup under a niche product brand. Another example is Gwaatema Products, a bakery that produces snacks using locally sourced ingredients. These SMEs not only benefit from SACCO loans to grow their processing capacity and market reach, but also actively participate in local farmer markets at the farmer centre in Karatu, where they showcase and sell their value-added traditional and agroecological products. This financial and market access linkage has strengthened their business viability, created economic opportunities and contributed to promoting local food systems and agroecological value chains in the region.

In addition to financial services, the SACCO network builds the capacity of its members by offering training and education on financial management, helping them to manage their resources effectively, improve their livelihoods and strengthen their small businesses or ecological farming activities.

Under MVIWAARUSHA's SACCOs, farmers' groups, especially those participating in farmer-managed seed system (FMSS) initiatives, have access to group loans with a repayment period of up to one year. These group loans have been instrumental in facilitating collective farming experiments that would otherwise be too risky or resource-intensive for individual farmers to attempt alone. Through this financing, groups have undertaken bulk production of indigenous maize seed varieties, aimed at both preserving genetic diversity and meeting the growing demand for local, resilient crops within community markets. Also, the loans have supported trials with diversified crop rotations,

integrating pulses, forgotten grains and other nutrient-rich local crops, contributing to soil health and improved household nutrition. This collective financial model reduces the risk borne by individual farmers by distributing responsibilities and outcomes across the group. At the same time, it fosters shared learning, encourages farmer-to-farmer innovation and strengthens the market base for niche traditional products, gradually rebuilding local seed systems and agroecological knowledge networks.

The financial services provided by MVIWAARUSHA's SACCOs have delivered significant, tangible outcomes in advancing local agrobiodiversity and sustainable agriculture. Through tailored loan products and flexible lending conditions, farmers have been empowered to revive and multiply traditional maize varieties, with dedicated support for farmer-led seed multiplication and local marketing initiatives under the FMSS. These financial interventions have also facilitated the widespread adoption of agroecological practices, such as integrating traditional and neglected crops into diversified farming systems, improving soil health, and enhancing resilience against increasingly frequent climate shocks. SMEs have been successfully linked to MVIWAARUSHA's network of SACCOs, enhancing their access to affordable, farmer-friendly financial services.

Microfinance services provided through MVIWAARUSHA's network of SACCOs, particularly MVIWAKA SACCO, have significantly contributed to the growth and sustainability of ecological farming practices among smallholder farmers. By 2024, 37% of MVIWAKA SACCO's total loan portfolio was dedicated to agroecological loans, reflecting a deliberate effort to financially support farmers practicing environmentally friendly and sustainable agriculture.

In MVIWAARUSHA's model, CMGs also serve as platforms for promoting agroecological practices, providing members with financial incentives, training and opportunities to invest in climate-resilient and sustainable farming ventures. Group savings and loans have enabled members to invest in various agroecological activities such as organic farming, intercropping, use of local seeds and sustainable soil-management practices. Notably, 49% of the groups have accumulated savings of 6–9 million Tanzanian shillings (US\$2,275–3,410), while individual loans issued issues vary from 7 to 12 million Tanzanian shillings (US\$2,650–4,550). These loans enable farmers to access meaningful capital for scaling up ecological farming initiatives.

Each member typically accessed between one to three loans per cycle, supporting a range of personal and economic needs. Of particular importance, 115 new business ventures focused on FMSS-related products were launched through this financing, showcasing how community-managed financial services drive agrobiodiversity initiatives and enterprise development. Beyond financial services, these CMGs have empowered members with financial literacy, improved household cashflow management, facilitated quick access to credit with minimal bureaucracy, and created avenues for investing in small businesses. They have also strengthened farmers' capacity to cope with lifecycle events and economic shocks, contributing to the resilience and prosperity of rural communities. For example, the group members received financial literacy training, learned recordkeeping skills and accessed loans with a six-month grace period and low interest rates specifically for agroecological activities for adopting and mitigating the impact of climate change.

In CMG groups, women make up the majority, accounting for over 79% of the total membership. This strong participation highlights the critical role women play in driving ecological farming initiatives and managing group savings and loans systems. Women and youth — often marginalised in conventional credit schemes — have gained access to resources that enable them to actively participate in experimental farming ventures. This has directly contributed to improved household food security, income diversification, and community-led conservation of indigenous plant genetic resources.

### 6.3 FFPO role in external finance partnerships

MVIWAARUSHA has supported its network of SACCOs by providing a revolving fund of 72,150,000 Tanzanian shillings (US\$27,335) to enhance access to affordable credit for small-scale farmers engaging in agroecological farming and small farming businesses across different districts. Funds for the revolving fund come from MVIWAARUSHA's external donors, including the nongovernmental organisation (NGO) Trias and other development partners.

Funds have been distributed to seven of the eight SACCOS, with amounts ranging from 4,650,000 Tanzanian shillings (US\$1,760) to 22,500,000 Tanzanian shillings (US\$8,525). The revolving fund

aims to strengthen the financial capacity of farmers (by providing credit for investment in sustainable agricultural practices), improve livelihoods and contribute to food security within their communities (see Table 12).

**Table 12. Allocation of revolving fund to MVIWAARUSHA's SACCOs (in Tanzanian shillings)**

Location	SACCO name	Revolving fund
Arusha DC	MVIWAENGU	22,500,000
Monduli	MVIWABU	10,000,000
Arusha DC	MVIWAEKE	7,500,000
Arusha DC	MVIWAIMBI	5,000,000
Karatu	MVIWAKA	15,000,000
Longido	KIPOK	7,500,000
Monduli	KOMOLONIK	4,650,000
Monduli	MANANA	-
	<b>TOTAL</b>	<b>72,150,000</b>

## 6.4 Future plans

MVIWAARUSHA's network of SACCOs and CMGs presents a compelling example of how community-based financial systems can empower farmers to diversify their agricultural practices and enterprise models, particularly in the context of agroecological and seed system innovations. By offering accessible, affordable and flexible financial products designed to reflect the realities of smallholder farmers, SACCOs have played a pivotal role in supporting a range of transformative agricultural activities. Farmers have been able to experiment with forgotten and neglected crops, adopt new production systems, and transition towards agroecological farming approaches that prioritise sustainability and resilience.

However, SACCOs and CMGs continue to face several operational challenges that limit their effectiveness and sustainability. A major issue is the limited financial literacy and business-management skills among members, which affects their ability to manage loans, savings and personal finances effectively. This gap in financial skills contributes to poor recordkeeping, weak business planning, and difficulties in loan repayment. Also, some SACCOs and CMGs operate with limited capital, which restricts their capacity to meet the growing demand for loans, especially during peak agricultural seasons. Leadership and governance issues also persist in some SACCOs, including limited leadership capacity, occasional conflicts of interest and inconsistent adherence to cooperative management principles, which undermines organisational efficiency and member trust. Furthermore, the problem of loan defaults and delayed repayments remains a serious challenge, largely due to inadequate loan assessments and poor financial management among some borrowers. Climate change has further compounded the situation, as unpredictable weather patterns and crop failures reduce farmers' incomes, making it difficult for them to meet loan repayment obligations. These interconnected challenges collectively affect the financial health, stability and growth potential of the SACCOs and CMGs organised under MVIWAARUSHA.

To address these challenges, MVIWAARUSHA is providing continuous capacity-building support and tailored financial literacy training for members and leaders to improve financial management, loan utilisation and governance practices. The organisation also provides business development services, including coaching, business planning support and financial monitoring, to reduce loan defaults and improve enterprise sustainability. Efforts to mobilise additional capital through partnerships, grant opportunities (via the revolving fund), and income-generating initiatives have helped to increase the loan fund size, while leadership mentorship programmes and regular governance audits have improved transparency, accountability and overall SACCO performance.

To further scale these impacts, MVIWAARUSHA plans to increase the number of CMGs, strengthen linkages between CMGs and SACCOs to expand access to larger capital, and promote financial services tailored for agroecological enterprises. MVIWAARUSHA also aims to link young SMEs to SACCOs for capital growth, support SACCOs on technological improvements in data management and financial systems, and enhance financial literacy for both members and leaders of SACCOs and CMGs to improve sustainability and service delivery.

MVIWAARUSHA plans to establish a new microfinance organization under tier two (2) of the financial Act, that will operate at a higher level than SACCOs, designed to provide a broader range of financial services to address the persistent challenge of limited capital faced by SACCOs and CMGs, while also supporting long-term sustainability. This institution will employ qualified professional staff to ensure efficiency, transparency, and compliance with financial regulations, while positioning itself to legally mobilize and manage funds from larger financial institutions, development partners, and banks. Unlike the current SACCOs model, the new microfinance organization will have the capacity to offer direct financing to both members and staff of the organization, expand loan products, enhance financial literacy, and strengthen the financial base of FFPOs under MVIWAARUSHA. This strategic move will not only help to address the capital gap but also create a reliable financial backbone to support agroecological enterprises, agrobiodiversity initiatives, and other member-driven economic activities.

In addition, several strategic next steps have been identified by MVIWAARUSHA. These include increasing the allocation of credit funds specifically earmarked for agroecological initiatives and seed production loans, enhancing financial literacy and business-planning services tailored to experimental and non-conventional farming enterprises, and establishing a dedicated innovation fund within SACCO structures. Such a fund would directly support farmer-led trials of new and forgotten crop varieties and the adoption of alternative production systems, reducing the financial risks of innovation. This approach will only work if government and/or development partners help cover part of the costs and risks associated with innovation. This would enable farmers to test and scale successful agroecological solutions. Finally, the fund would strengthen the role of SACCOs in promoting sustainable farming while safeguarding members against potential losses from trial failures.

## 7. Conclusions and recommendations

### 7.1 Conclusions

Knowledge exchange, seed management and enterprise development are crucial to maintaining agrobiodiversity. This is made possible through a strong commitment to member-based farmer organisations and networks, sharing local knowledge and resources between members and neighbours, and through partnerships with external organisations including local, national and international media.

MVIWAARUSHA has acted as a critical agent in promoting agroecology and agrobiodiversity to its members and networks. It is working hard to find appropriate types of education for its members that not too theoretical but more practical. The growing diversity of crops being produced by its members is also opening up new markets and ways to generate incomes.

MVIWAARUSHA is also focused on tackling the impacts of climate change, by favouring systems that mix crops with trees and livestock fodder, that make better use of livestock waste for fuel and compost, and which protect water catchment areas and improve water harvesting and irrigation. These systems are complex and take both time and good leadership to develop. However, MVIWAARUSHA is working to put them into practice through its regular knowledge exchanges, seminars and training, and by promoting agrobiodiversity using approaches such as community seed banks to conserve local sources of seed.

Additionally, MVIWAARUSHA's facilitation of SACCOs and CMGs has significantly expanded financial inclusion and enabled members to access affordable credit tailored for agroecological practices. These financial services have supported the revival of traditional crops, promoted ecological farming techniques, and fostered enterprise development, particularly among women and youth, strengthening community resilience and enhancing on-farm agrobiodiversity.

### 7.2 Recommendations

For future agroforestry sustainability, we recommend that MVIWAARUSHA:

- Identifies its most active members as trainers (those who very quickly learn from the successes of others and put this learning into practice).
- Provides more ongoing and practical hands-on teaching/education. Members find farmer field school-type approaches more useful than theoretical training.
- Promotes the greater use of agroecological approaches using drought resistant crops, cover-crop farming and agroforestry (for soil improvement and moisture retention).
- Protects natural vegetation patches in and around farms, including trees.
- Protects water catchment areas to ensure a sustainable supply of water for irrigation.
- Continues market research to access international markets for organically grown crops.
- Continues to support its members to attend agricultural markets, shows and seed fairs.
- Supports the integration of poultry huts (chicken huts) and other zero-grazing livestock to support food security and to ensure an ongoing supply of livestock manure.
- Continue to support and expand SACCO and CMG financial services that promote agroecological farming and seed-system innovation, especially those benefiting women and youth.
- Enhance financial literacy and loan-management training for SACCO and CMG members to reduce portfolio-at-risk and improve sustainability of community-based finance systems.

## References

Hou Jones, X, Macqueen, D, Núñez del Prado Nieto, I, Sorsby, N and Duffy, J (2024) Business unusual: how business and investment pioneers are transforming forest and food supply chains. IIED, London. [www.iied.org/22396iied](http://www.iied.org/22396iied)

MVIWAARUSHA (2023) Organisational profile.

MVIWAARUSHA (2023b) Total number of members and networking FFPO groups. MVIWAARUSHA network of farmer groups and pastoralists in the Arusha region, Arusha, Tanzania.

Khush, GS (1996) The importance of biodiversity to food and agricultural systems across the globe. World Food Prize Foundation.

Sadio, S and Negrero-Castillo, P (2003) Trees outside forests: contributing towards sustainable development. Paper submitted to the XII World Forestry Congress, Quebec City, Canada, 21–28 September 2003.

The report is produced by the Nature Nurture project funded by the Global Centre on Biodiversity for Climate (GCBC) and implemented by IIED, MVIWAARUSHA and the Non-Timber Forest Products — Exchange Programme (NTFP-EP). GCBC is a UK official development assistance (ODA) programme that aims to support developing countries to shape decision making and develop policies that better value, protect, restore and sustainably manage biodiversity in ways that tackle climate change resilience and poverty alleviation. The GCBC is funded by the UK's Department for Environment, Food and Rural Affairs working in partnership with DAI Global as the fund manager lead.

This material has been funded by UK International Development funds. However, the views expressed do not necessarily reflect the UK government's official policies.

The case study in this report was originally commissioned in 2023 using a template prepared by IIED for the Forest and Farm Facility (FFF). The FFF is supported by the governments of Sweden, Finland, Germany, Norway, the Netherlands and the United States of America, and the European Union. In 2025 the case study was updated to include additional research on finance strategies for diversified production to produce this report under the Nature Nurture project.

