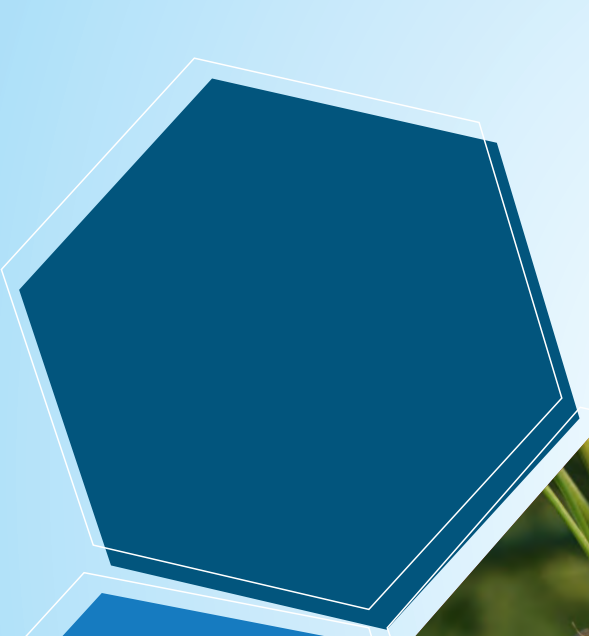
DISSEMINATION AND SCALING OF A DECISION SUPPORT FRAMEWORK FOR CLIMATE CHANGE ADAPTATION FOR SMALLHOLDER FARMERS IN SOUTH AFRICA

E Kruger, N Dlamini, T Mathebula, BT Maimela, S Mathela, B Letty and K Kotschy



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Dissemination and scaling of a decision support framework for climate change adaptation for smallholder farmers in South Africa

E Kruger[1], N Dlamini[2], T Mathebula[1], BT Maimela[1], S Mathela[3], B Letty[4] and K Kotschy[5]
[1] Mahlathini Development Foundation,
[2]StratAct
[3]Environmental and Rural Solutions
[4]Institute of Natural Resources
[5]Independent MERL Consultant

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This publication is part of a series. The other publications in the series are:

- Community-based climate change adaptation and local food systems: Handbook and case studies (**WRC report no. TT 967/2/26**)
- Climate resilience impact measurement for poor rural communities. A MERL (Monitoring, evaluation, reflection and learning) manual for community-based climate change adaptation (CbCCA) (**WRC report no. TT 967/3/26**)
- Community-owned water access: Guidelines and case studies (**WRC report no. TT 967/4/26**)
- Microfinance handbook for smallholder farmers in South Africa: A case study on small businesses (**WRC report no. TT 967/5/26**)
- Multistakeholder platform development manual: Guidelines for successful implementation (**WRC report no. TT 967/6/26**)
- Climate Resilient Agriculture: Practices for smallholder farmers. Farmer Handouts: English (**WRC report no. TT 967/7/26**)
- Climate Resilient Agriculture: Practices for smallholder farmers. Farmer Handouts: isiXhosa (**WRC report no. TT 967/8/26**)
- Climate Resilient Agriculture: Practices for smallholder farmers. Farmer Handouts: isiZulu (**WRC report no. TT 967/9/26**)
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EXECUTIVE SUMMARY

Climate change (CC) is the biggest threat of our time, with far-reaching consequences and devastating impacts on people, the environment, and the economy. The adverse effects of climate change are already being felt. Besides mitigation, there is a growing need to adapt. South Africa is especially vulnerable to CC impacts, particularly in respect of water and food security, as well as impacts on health, human settlements, infrastructure, and ecosystem services. A rapid adaptation response is necessary. Despite well-designed national policy and strategy processes around both mitigation and adaptation to climate change, international commitments through the NDCs (Nationally Determined Contributions) and several international conventions, and the recently promulgated Climate Change Act, regional and local authorities, communities, and smallholder farmers remain largely uninformed and unsupported with respect to strategies and potential actions for adaptation and improved resilience. Developing effective climate response actions is becoming increasingly urgent for South Africa. There is a strong need for a coherent and more integrated approach that will incorporate the voiceless poor in participation processes and access to information and decision-making in transparent, equitable, and non-discriminatory ways, and which will provide for their involvement in each step of a project/process (from identification, formulation, implementation, and monitoring to evaluation) (NDRC, 2020).

The ideal combination of CRA (climate-resilient agriculture) actions varies from location to location. For this reason, site-specific assessments are critical aspects of CRA implementation, identifying the most suitable actions for each agroecological and socioeconomic context. Concrete actions must be taken to enhance the evidence base to underpin strategic choices, promote, and facilitate wider adoption of appropriate technologies by smallholder farmers, and develop institutional arrangements to support, apply, and scale out CRA in the smallholder farming systems.

The CRA decision support platform, developed between 2017 and 2021 (WRC, 2021) aims to improve regional and local planning by providing a coherent process for directing climate change and agriculture adaptation investments and programmes. With transparency and participation at the heart of this process, local knowledge and scientific evidence can work together to establish realistic pathways for increasing CRA adoption. Actions are required from a broad range of stakeholders, including the government and the public sector, private sector, academia and research, non-government organisations (NGOs), and community-based organisations (CBOs), among others. Sustainable soil, water, and natural resource-use options and practices allow for increased productivity, food security, and wellbeing for a range of smallholder farmers – from subsistence through to semi-commercial.

Between 2022 and 2025, a process of dissemination and scaling was undertaken (Water Research Commission (WRC) project no C2022/2023-00746). Defined research objectives were:

1. Creating and strengthening integrated institutional frameworks and mechanisms for scaling up proven multi-benefit approaches that promote collective action and coherent policies.
2. Scaling up integrated approaches and practices in CbCCA (Community-based climate change adaptation).
3. Monitoring and assessment of environmental benefits and agro-ecosystem resilience.
4. Improvement of water resource management and governance, including community ownership and bottom-up approaches.

The approach was to work at local, regional, and national levels using a model of interrelated micro-, meso-, and macro-level CoPs (communities of practise) to create and support different levels of institutional platforms for the horizontal and vertical integration of this model.

Outputs of this research process include an updated version of the community-level and online individual decision support processes (https://www.mahlathini.org/our-work/smallholder-decision-support-system/), including an expanded range of CRA practices which were piloted and tested across five different agroecological zones in South Africa. Practices were expanded to include water and resource conservation and management, livestock production, and organic field cropping options. A total of ten new practices is now included in the DSS (decision support system), bringing the number of considered practices to a total of fifty-six.

Other outputs include the development of manuals, guidelines, and case studies in thematic areas, including microfinance options for smallholder farmers, CbCCA and local food systems, community-owned water access and schemes, and the development of multistakeholder platforms.

A significant innovation was the development of a climate resilience impact measurement methodology and tool. The output consists of a manual, examples, and an online tool and dashboard. Criteria and indicators for this tool have been thoroughly vetted and tested in this research process.

Interaction with and between the three levels of CoPs for dissemination and scaling has been ongoing and intensive. At the local- or micro-level, thirty village-based groups (740 participants) used the climate change adaptation (CCA) decision support process through training and implementation, across five provinces. This was undertaken by close collaboration with several support organisations, including Environmental and Rural Solutions (Eastern Cape (EC)), Sociotech (Gauteng), Lima-Rural Development Foundation (Northern-Cape and Limpopo), Association for Water and Rural Development, Tsogang Water and Sanitation (Limpopo), the Wildtrust (Zululand, KwaZulu-Natal(KZN)), and World Wide Fund for Nature (Bergville, KZN). These interactions were generously co-funded by SODI, a German social solidarity non-government organisation.

The meso-level interactions consisted of events, processes, and cross-visits with clusters of village-based groups as well as regional platforms. Events (six in total) were primarily co-hosted with organisations such as the Department of Agriculture and Rural Development (DARD), the Maize Trust, and the Agricultural Research Council (ARC). Planning and review processes with clusters of villages (twelve in total) have been undertaken around a range of themes, including annual CRA implementation reviews and planning, Conservation Agriculture (CA), local marketing, VSLAs (village savings and loan associations), water and natural resource management, and seed saving. Cross-visits (six in total) were undertaken with farmers, NGOs, and CBOs (Institute of Natural Resources (INR), Endangered Wildlife Trust (EWT), Wildtrust, World Wildlife Foundation (WWF), Extended Freshwater and Terrestrial Environmental Observation Network (EFTEON), and Surplus Peoples Project (SPP)) across three provinces.

The macro-level interactions were undertaken with national platforms and networks, including, for example, the Adaptation Network, the Amanzi for Food platform (Rhodes University), the Agroecology Network (with provincial branches in KZN and Limpopo), and the PCC (Presidential Climate Commission). These interactions included attending events and webinars, giving presentations, and collaborative implementation. Activities also included presenting papers at national and international conferences (10), multistakeholder workshop presentations (6), and newsletter articles (5). This has allowed for ongoing and intensive dissemination of the CbCCA methodology and CRA practices.

The results of the micro, meso, and macro-level aspects of this research were developed as loose-standing case studies, handbooks, and guidelines. These documents include the learning and recommendations for the specific thematic areas covered in each. In the following chapters of this report, each of these documents and products is briefly discussed and summarized. The tables of contents for the documents are also presented to provide a detailed overview of the content of each.

The products developed are as follows:

- The Decision Support Platform and farmer-level handouts(Chapter 4)
- Microfinance for smallholder farmers handbook and case studies (Chapter 5)
- CbCCA and local food systems handbook and case studies (Chapter 6)
- Climate resilience Impact Measurement for Rural Communities: A MERL manual for CbCCA (Chapter 7)
- Community-owned water access guidelines and case studies (Chapter 8) and
- Multistakeholder platform development guidelines for successful implementation (Chapter 9).

These documents have been made available on the MDF website in the interim (https://www.mahlathini.org/our-work/water-research-commission-climate-change-adaptation-for-smallholder-farmers-in-s/) and will also be published through the WRC within six months of project finalisation.

Capacity building at the community level was intensive, with CRA implementation processes facilitated across five provinces, in 34 villages with a total of 740 participants. All participated in the innovation

development process, which included an improved understanding of CC, an analysis of CC impacts, exploration of CCA strategies, prioritisation of adaptive strategies, development of adaptation plans, experimentation with CRA practices, review of the impact of the practices on CC resilience, and planning for expanded implementation. Capacity building at the institutional level took several forms: learning and mentoring for facilitators in six CSOs, knowledge sharing in learning networks, information sharing in conferences, seminars, and policy development structures, and assistance with programmatic planning for organisations specifically related to indicator development and climate resilience. Capacity development for postgraduates included the completion of one PhD degree (University of KwaZulu-Natal – Mr N Dlamini) and one MPhil degree (University of Western Cape, PLAAS – Ms T Mathebula). Capacity development for MDF staff took the form of a range of short courses and seminars.

This initiative demonstrated that a social learning approach—centred on learning groups or communities of practice, supported by local facilitators and farmer-level experimentation—was highly effective in promoting and implementing CRA and W&NRM responses. Participants significantly strengthened their ability to analyse climate change impacts, understand the environmental consequences of their activities, and make improved decisions both individually and collectively. Learning was reinforced through participatory processes and iterative cycles of practice, observation, and reflection, with local facilitators playing a critical role in sustaining motivation and engagement. Participants consistently reported that group learning far exceeded what could have been achieved individually, leading to continued collaboration beyond the formal project.

Despite these successes, the process faced substantial challenges, including limited engagement from government authorities, persistent drought and water scarcity, insufficient funding for smallholder farmers, and internal conflicts driven by resource competition and local political instability. Nevertheless, the resilience and determination of participating communities were central to the uptake of the approaches introduced.

Significant learning also occurred within supporting organisations and partner NGOs, with fieldworkers and interns acquiring new competencies in farming practices, resource management, facilitation, and social learning methodologies. Collaboration among civil society organisations improved through a shared understanding of climate adaptation needs, resulting in some coordination of activities and budgets. Engagement with government and municipal stakeholders was less positive, often constrained by scepticism, entrenched institutional paradigms, and limited empathy for smallholder realities.

The testing of CRA practices highlighted that resilience gains are greatest when multiple practices are implemented together within a systems perspective. Locally relevant practices that address felt needs and build on existing knowledge were most readily adopted. The development of a climate resilience impact measurement methodology represents a key innovation, enabling a clear demonstration of positive livelihood and well-being outcomes from coherent CRA implementation.

Overall, the project provides a robust, scalable model for CbCCA. Continued support is recommended to scale implementation, strengthen institutional engagement, refine impact measurement tools, and expand adaptive research at local and district levels. The approach is considered adaptable to diverse rural contexts and suitable for incorporation into regional and national climate adaptation strategies.

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Dr J.J. Anderson	Agricultural Research Council
Dr T. Dirwai	International Water Management Institute
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Others	
Dr B. Letty	Institute of Natural Resources – INR
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ACRONYMS & ABBREVIATIONS

A4F	Amanzi for Food Network
AEZ	Agroecological zone
AN	Adaptation Network
ARC	Agricultural Research Council
AWARD	Association for Water and Rural Development
CA	Conservation agriculture
CBO	Community-based organisation
CC	Climate change
CCC	Cross Catchment Collective
CBCCA	Community-based climate change adaptation
CCA	Climate change adaptation
CoP	Community of Practice
CRA	Climate resilient agriculture
CSA	Climate-smart agriculture
CSA	Conservation South Africa
CSO	Civil society organisation
CWRR	Centre for Water Resources Research
DARD	Department of Agriculture and Rural Development
DFFE	Department of Forestry, Fisheries, and the Environment
DMs	District Municipalities
DSS	Decision support system
DUCT	Duzi-Umngeni Conservation Trust
EbA	Ecosystem-based adaptation
EC	Eastern Cape
EFTEON	Extended Freshwater and Terrestrial Observation Network
ERS	Environmental and Rural Solutions
EWT	Endangered Wildlife Trust
FAIS	Financial and Intermediary Services
GLSCRP	Giyani Local Scale Climate Resilience Project
INR	Institute of Natural Resources
K2C	Kruger to Canyons Biosphere
KZN	KwaZulu-Natal
LED	Local Economic Development Unit
LG	Learning group
LIMA	LIMA Rural Development Foundation
LL	Living Lakes Network
LMs	Local Municipalities
MDF	Mahlathini Development Foundation
M&E	Monitoring and evaluation
MERL	Monitoring, evaluation, research, and learning
MN	Meat Naturally Africa
NGO	Non-Government Organisation
OLM	Okhahlamba Local Municipality
PGS-SA	Participatory Guarantee System-South Africa
PIA	Participatory impact assessment
PCC	Presidential Climate Commission
SAEON	South African Environmental Observation Network
SANBI	South African National Botanical Institute
SAOSO	South African Organic Sector Organisation
SODI	Solidarity Service International eV
SPP	Surplus Peoples Project
UCP	Umzimvubu Catchment Partnership
UKZN	University of KwaZulu-Natal
VSLAs	Village savings and loan associations
W&NRM	Water and natural resources management
WWF	Worldwide Fund for Nature South Africa
WRC	Water Research Commission

CHAPTER 1: BACKGROUND

1.1 INTRODUCTION

This dissemination and scaling adaptive research process is built on the decision support platform and CbCCA models developed for a WRC research process (WRC, 2021) titled *Collaborative knowledge creation and mediation strategies for the dissemination of Water and Soil Conservation practices and Climate Smart Agriculture in smallholder farming systems*, which slowly morphed from this unwieldy wording to become *Climate Change Adaptation for Smallholder farmers in South Africa: An implementation and decision support guide*. Grappling with the concepts and processes in that research process provided a clearer direction over time. Climate-smart agriculture (CSA) was replaced by climate-resilient agriculture (CRA) as the latter definition more clearly represents the content and intent of the work done.

The initial research, conducted between 2017 and 2020, aimed to evaluate and identify best-practice options for climate-resilient agriculture (CRA) and soil and water conservation in smallholder farming systems across three bioclimatic regions of South Africa. The study sought to strengthen collaborative knowledge co-creation of CRA practices with smallholder farmers, as well as to test and adapt existing climate-smart agriculture (CSA) decision support systems (DSS) for application in the South African smallholder context. In addition, the research evaluated the impacts of CRA interventions identified through the DSS by piloting selected practices within smallholder farming systems, with particular emphasis on water productivity, social acceptability, and farm-scale resilience. Finally, the study assessed the suitability of visual and proxy indicators for an incentive-based financing model at the community level, validating these indicators against field and laboratory analyses of soil physical and chemical properties and measures of water productivity.

Outputs of the initial phase of this research included the smallholder decision support platform, a series of facilitation and implementation manuals, stakeholder platforms for continued support (post-project), and lessons learned from the pilot implementation processes.

Innovations during the initial four-year research period included the development of climate change adaptation (CCA) decision support processes for smallholders, delivered through an online platform for individuals and a facilitated community-based approach for groups. The study conducted community-level experimentation with 18 prioritised climate-resilient agriculture (CRA) practices across three agroecological zones to improve soil and water management and productivity and developed a methodology to assess their impacts on community-level climate resilience using qualitative and quantitative indicators. CRA innovations involved the introduction of new practices into smallholder farming systems, including small-dam construction, spring protection using slotted pipes for seepage collection, shade-cloth tunnels, bucket drip irrigation kits, cover crops, livestock integration into conservation agriculture, and organic mango production. Social innovations strengthened social agency through learning groups that supported environmental and water management, knowledge sharing, value-chain development, and microfinance access for rural communities.

The recently completed (February 2026) follow-up research project, *Dissemination and scaling of a decision support framework for climate change adaptation for smallholder farmers in South Africa,* was aimed at strengthening the DSS and CRA practices while also developing platforms and relationships to enable wider and institutional adoption of the CRA practices and processes using the DSS. This is described in more detail in the following section.

1.2 PROJECT AIMS

This section provides a summary of the project outcomes and expected impacts for the recently completed project (2022-2025). It also details the deliverables, outputs, and innovations of this project.

Table 1: Aims of the WRC project (2022-2025)

Aims	
No	**Aim**
1	Create and strengthen integrated institutional frameworks and mechanisms for scaling up proven multi-benefit approaches that promote collective action and coherent policies.
2	Scaling up integrated approaches and practices in CbCCA.
3	Monitoring and assessment of environmental benefits and agro-ecosystem resilience.
4	Improvement of water resource management and governance, including community ownership and bottom-up approaches.

The main expected outcome was that vertical and horizontal integration of the community-based climate change adaptation (CbCCA) model and associated processes would lead to improved management of water and environmental resources, enhanced rural livelihoods, and increased climate resilience among smallholder farmers in communal tenure areas of South Africa.

The anticipated impacts included the scaling out and scaling up of climate-resilient agriculture (CRA) frameworks and implementation strategies, resulting in greater resilience and food security at the local level; the incorporation of smallholder decision-support frameworks and CRA implementation approaches into a range of programmatic and institutional processes; and improved awareness and adoption of appropriate agricultural, water management, and CbCCA practices across diverse bioclimatic and institutional contexts. The research was also expected to contribute a robust climate change resilience impact measurement tool to support local, regional, and national monitoring processes, as well as to provide concrete models for the ownership and management of group-based local water access and infrastructure.

The research was implemented through seven interrelated activities carried out sequentially and iteratively over the study period, as outlined below.

1. **Desktop Review:** A desktop review was undertaken to assess existing (CbCCA) policies, frameworks, and implementation approaches currently applied in South Africa.

2. **Establishment of Communities of Practice (CoPs):** Communities of practice were established at multiple levels, including village-based learning groups, innovation platforms, and multistakeholder platforms. Village-based learning groups were formed, with at least one group per province. Innovation platforms were constituted as clusters of learning groups, with three platforms established—one per province—each comprising approximately 9 to 36 learning groups. In addition, existing multistakeholder platforms, such as the uMzimvubu Catchment Partnership, the SANBI Living Catchments Programme, and the Adaptation Network, were engaged to support coordination and policy alignment.

3. **Definition of Roles and Implementation Parameters:** Clear roles and implementation parameters were defined for each level of the CoPs. Village-based learning groups focused on CbCCA learning and reflection cycles, farmer-level experimentation, refinement of climate-resilient agriculture (CRA) practices, local food systems development, water and natural resource access and management, and knowledge sharing within and across villages.

   Innovation platforms facilitated learning and exchange among clusters of learning groups and local and regional stakeholders, supporting knowledge mediation, co-creation, and engagement with government departments and officials through one to two sessions annually.

   Multistakeholder platforms focused on the development of CbCCA frameworks and implementation processes, including linkages to integrated development plans and disaster risk reduction planning at district and local municipal levels, alignment with national adaptation strategies and nationally determined contribution (NDC) reporting, and exploration of resilience and impact measurement models, convened one to two times per year.

4. **Cyclical Implementation Across Thematic Areas:** Cyclical implementation processes were applied across all three CoP levels, encompassing information sharing, analysis, action, and review within four thematic focus areas: climate-resilient agriculture practices, smallholder microfinance options, local food systems and market development, and community-owned

water and natural resource access and conservation management. Each thematic area was led by a senior researcher supported by a dedicated sub-team.

5. **Monitoring and Evaluation Framework:** A monitoring and evaluation framework was implemented, focusing on a limited set of core quantitative indicators, including water productivity, crop yields, soil organic carbon, and overall soil health. This activity also included the development of qualitative and quantitative indicators for resilience and impact and the exploration of complementary assessment models to inform an overarching evaluation framework.

6. **Knowledge Synthesis and Dissemination:** Synthesis outputs were produced, including reports, handbooks, and process manuals derived from the preceding activities, with a primary emphasis on knowledge dissemination and practical application.

7. **Refinement of the CbCCA Decision Support Platform:** The CbCCA decision support platform was refined and updated through the incorporation of new datasets and insights generated through the research implementation and dissemination processes.

The following deliverable reports were produced during the research process

Table 2: List and description of research deliverables

No.	Deliverable Title	Description
1	Desktop review for CbCCA in South Africa	Desktop review of South African policy, implementation frameworks, and stakeholder platforms for CCA.
2	Report: Monitoring framework, ratified by multiple stakeholders	Exploration of appropriate monitoring tools to suit the contextual needs for evidence-based planning and implementation.
3	Handbook on scenarios and options for successful smallholder financial services within South Africa	Summarize VSLA interventions in SA, Govt, and Non-Govt, and design the best-bet implementation process for smallholder microfinance options.
4	Development of CoPs and multi-stakeholder platforms	Design development parameters, roles, and implementation frameworks for CoPs at all levels, CRA learning groups, Innovation, and multi-stakeholder platforms, within the CbCCA framework.
5	Report: Local food systems and marketing strategies contextualized - Guidelines for implementation	Guidelines and case studies for building resilience in local food systems and local marketing strategies towards sustainable local food systems (local value chain)
6	Case studies: encouraging community ownership of water and natural resources access and management	Case studies (x3) towards providing an evidence base for encouraging community ownership of natural resource management through bottom-up approaches and institutional recognition of these processes.
7	Case studies: CbCCA implementation case studies in 3 different agroecological zones in SA	CbCCA implementation case studies in 3 different agroecological zones within South Africa
8	Refined CbCCA decision support framework with updated databases and CRA practices	Refined CbCCA DSS database and methodology with the inclusion of further viable and appropriate CRA practices
9	Manual for the implementation of successful multistakeholder platforms in CbCCA	Methodology and process manual for successful multi-stakeholder platform development in CbCCA
10	Final Report: Toc	Final report: Summary of all findings, guidelines, case studies, learning, and recommendations

1.2.1 Project outputs and innovations

The results of the micro, meso, and macro-level aspects of this research have been developed as loose-standing case studies, handbooks, and guidelines. These documents include the learning and recommendations for the specific thematic areas covered in each. In the following chapters of this report, each of these documents and products is briefly discussed and summarized. The tables of contents for the documents are also presented to provide a detailed overview of the content of each.

The products developed are as follows:

- The Decision Support Platform and farmer-level handouts(Chapter 4)
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- Community-owned water access guidelines and case studies (Chapter 8) and
- Multistakeholder platform development guidelines for successful implementation (Chapter 9).

1.3 SCOPE AND LIMITATIONS

This study was implemented as CbCCA initiative in selected rural communities and catchments, with a focus on smallholder farming systems and local water and natural resource management. Implementation was undertaken in partnership with non-governmental and civil society organisations, with engagement from local and district government structures where feasible. While alignment with institutional mandates was pursued, the work operated largely outside formal government implementation frameworks, limiting institutional uptake during the project period but enabling flexible, context-specific adaptation responses.

The thematic scope of the research centred on climate-resilient agriculture (CRA) and integrated water and natural resource management (W&NRM), including soil and water conservation, microclimate management, rainwater harvesting, crop and livestock systems, and rangeland management. A systems perspective was adopted, recognising that resilience outcomes emerge from the combined and reinforcing effects of multiple practices rather than from isolated interventions. As a result, the study did not aim to identify universal best-practice solutions, but to assess the performance of locally appropriate adaptation options.

The study applied a social learning and adaptive research methodology, using learning groups or communities of practice supported by local facilitators, participatory climate risk analysis, and farmer-level experimentation. Adaptive research was framed as an iterative process of implementation, reflection, and adjustment, prioritising relevance and learning over controlled experimentation. Consequently, findings are context-specific and not intended for statistical generalisation or strict attribution.

The research was conducted over a defined project period that was sufficient to demonstrate changes in practices, decision-making capacity, and short- to medium-term livelihood outcomes, but insufficient to fully assess long-term ecological and hydrological impacts. Climatic variability, including drought conditions, further influenced outcomes in ways beyond the control of the study.

Participation was voluntary and shaped by local social dynamics, including resource competition and political instability, resulting in variable levels of engagement and outcomes across communities. Impact assessment was supported by a climate resilience measurement methodology that demonstrated positive trends and synergies between practices, although some social and institutional changes remain difficult to quantify, and attribution is complicated by overlapping interventions.

Overall, the scope and limitations described are inherent to participatory, adaptive research in complex rural systems and underscore the need for long-term engagement and institutional support to enable effective scaling of CbCCA approaches.

CHAPTER 2: RESEARCH PROCESS AND METHODOLOGY

2.1 RESEARCH SUMMARY

The aim of the current process was the vertical and horizontal integration of this community-based climate change adaptation (CbCCA) framework and process into CoPs at various organisational levels/scales, for improved water and environmental resources management, improved rural livelihoods, and improved climate resilience for smallholder farmers in communal tenure areas of South Africa. We aimed to do this through:

- Further exploration of CRA practices across a broader range of agroecological zones, into the DSS, and updating of the DSS online platform.
- The creation and strengthening of institutional frameworks and mechanisms for scaling up these approaches and frameworks.
- The development and testing of a coherent framework and indicators for climate resilience and
- Further exploration of the improvement of water resource management and governance, including models for community ownership and bottom-up co-management approaches.

The four broad activities outlined above were considered at three different scales (local, regional, and national) throughout the research process, to ensure both horizontal and vertical scaling in the dissemination processes, as shown in Figure 1 below. The research process was embedded within CoPs structured around inquiry, design, interaction, communication, collaboration, knowledge sharing, and piloting and roll-out processes. CoPs took various forms, including learning groups (LGs), innovation platforms, forums, networks, and research and implementation teams, providing a social learning environment for shared inquiry and experimentation.

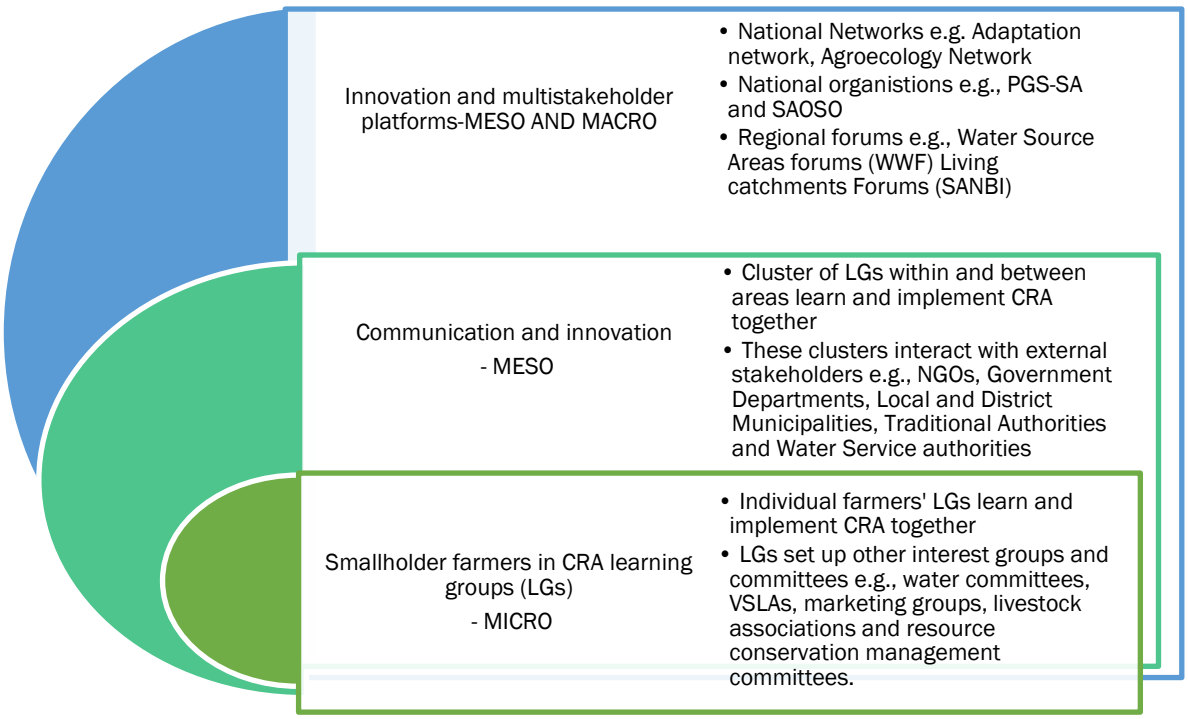


Figure 1: Nested levels of CoPs (local, meso, and macro)

2.2 RESEARCH METHODOLOGY

The overall research process was designed as an adaptive, action-oriented, and participatory methodology to support the development and implementation of CRA and CbCCA contexts. The approach integrated iterative learning, farmer-led experimentation, and biophysical enquiry to enable context-specific responses to climate variability and change (FAO, 2013) (Armitage, Marschke, & R., 2008).

Action research principles shaped the collaborative structure of the process. Farmers, researchers, extension practitioners, and other stakeholders engaged as co-researchers in identifying climate risks, co-designing adaptation options, implementing practices, and reflecting on outcomes. Repeated cycles of planning, action, observation, and reflection strengthened social learning, enhanced adaptive capacity, and supported the co-production of locally relevant climate adaptation knowledge.

2.2.1 Local-level CoPs research methodology

The research methodology was grounded in socio-ecological systems thinking and innovation systems development, as outlined in the Facilitation Manual produced in the initial phase of this research (https://www.mahlathini.org/our-work/smallholder-decision-support-system/wrc-cca-facilitation-manual/). These research methodologies informed the design of a participatory, community-based facilitation and implementation process aimed at supporting climate change adaptation in farming systems.

The methodology integrated learning and practice to enable meaningful adaptation. In line with contemporary theories of learning and change (Lotz-Sisitka & Pesanayi, 2019), knowledge was considered meaningful when it was directly related to farmers' lived experiences, mediated within local contexts, and able to expand existing knowledge and practices. These principles guided the facilitation approach and were operationalised through the establishment of Communities of Practice (CoPs).

An innovation systems development approach was applied, emphasising collaboration between farmers, researchers, and other stakeholders. Agricultural challenges were jointly analysed, and alternative farming practices were tested through collective exploration and experimentation, leading to the co-development of new technologies and socio-institutional arrangements to support sustainable livelihoods.

Each CoP process commenced with an introductory workshop that addressed climate change, its impacts on livelihoods and farming systems, and potential adaptation options. These workshops introduced relevant concepts and practices, explored their integration into existing farming systems, and included practical demonstrations. The facilitation process functioned as a group-based decision support system, encompassing all criteria addressed in individual decision support tools.

Within each CoP, selected farmers volunteered to undertake on-farm experimentation (farmer-led experimentation) through farmer-level trial plots. CRA practices were implemented alongside farmers' standard practices, which served as control plots. Learning occurred throughout each season through collective observation, reflection, and discussion of implementation processes and outcomes.

At the end of each season, CoPs collectively assessed and reviewed the performance of the tested practices. Based on these assessments, decisions were made regarding implementation and experimentation in subsequent seasons, enabling iterative learning and continuous adaptation of farming systems. In addition to experimentation, CoPs undertook other collaborative activities relevant to their priorities, including improved access to water and local market opportunities.

Farmer-led experimentation and demonstration of practices were conducted over three consecutive seasons. Research sites were selected to represent diverse agroecological conditions across South Africa, ensuring contextual relevance and supporting the transferability of learning.

2.2.2 Meso-level CoPs research methodology

The meso-level interactions allowed for communication and innovation through a range of activities for learning groups in different areas and local and regional stakeholders in a range of different settings. These included collaborative and joint learning and implementation as well as events, cross-visits, webinars and stakeholder forums.

In all cases, the CbCCA platform was introduced to underpin the process, within the thematic areas of CRA, local food systems, microfinance for smallholder farmers, local water access, and development of multi-stakeholder forums. For these collaborations, the case studies and materials developed in the research project were used.

2.2.3 Macro-level CoPs research methodology

The research team participated in several multistakeholder platforms, networks, and communities of practice (CoPs) to raise awareness, disseminate information, and incorporate the CbCCA platform methodology into local and regional planning processes. The intention was also to develop methodological coherence for the themes to be explored in this brief.

Interactions here consisted of several different activities. The research team attended events, webinars, and cross-visits of existing multistakeholder forums to share the methodology, learnings, and materials for the CbCCA platform developed through this research and to find mechanisms for the introduction of this framework into the broader environment. The research team undertook a study of different multistakeholder formation processes to synthesise best practice options, and the research team was involved in the development of a multistakeholder forum, the Northern Drakensberg Collaborative (NDC), where the learnings from the interactions and best practise synthesis were applied to starting and running a new multistakeholder forum.

2.3 THE CbCCA PLATFORM

MDF collaborated with SODI Solidarity Service International eV (SODI) and the Water Research Commission to build a programme in community-based climate adaptation (CbCCA) in South Africa. We conceptualized climate change adaptation for smallholder farmers through climate-resilient agriculture (CRA) and water and natural resources management (W&NRM) on three nested levels: micro-, meso-, and macro-levels (Figure 1). At the micro-level, participants are farmers interacting with each other - and possibly others in their community - in peer learning groups, interest groups, and committees. As one moves to the meso- and macro-levels, the range and diversity of people and organizations involved broadens to include other players such as local and national government, civil society organizations (CSOs), the private sector, and academic institutions. The connections across the three levels or scales are important for ensuring that farmers' issues, concerns, and preferences are understood and taken up regionally and nationally (e.g., into policy, planning, and communications), and that farmers can benefit from the support of these diverse stakeholders (e.g., through relationships, learning exchanges, grants and financial support and training).

The CbCCA framework consists of the DSS, both the community-level facilitated process, as well as the online individual tool. It incorporates the curated list of CRA practices appropriate for different types of smallholder farmers in different contexts, as well as the resource management and water access techniques piloted and tested during this research process. It includes the learning processes and materials developed for smallholder farmers, the handbooks, guidelines, and case studies developed, and the climate resilience impact measurement methodology and tool developed.

CHAPTER 3: RESULTS

This chapter provides a brief high-level summary of the results achieved over the research duration of three and a half years. Details of these results were provided in the nine deliverable reports submitted to the WRC and can also be found on the MDF website (https://www.mahlathini.org/our-work/water-research-commission-climate-change-adaptation-for-smallholder-farmers-in-s/).

The results are summarized according to the three levels /scales outlined above.

3.1.1 Smallholder farmers in CRA learning groups.

The research process was implemented through the continuation and strengthening of selected Climate Resilient Agriculture (CRA) learning groups that had previously been supported by MDF and had demonstrated strong performance in implementation and the development of social agency. These groups served as focal platforms for further exploration of food system dynamics, water stewardship, and governance, as well as structured engagement with local and district municipalities.

A sub-group of new villages in different agroecological zones, supported by organizations other than MDF were included through collaborative arrangements with these organizations to broaden the dissemination of the CbCCA framework. This allowed the research team to incorporate the data generated through monitoring into the online DDS tool and to develop farmer learning materials in a range of local languages. It also expanded the range of CRA and W&NRM practices, which could be tested and incorporated into the DSS, and expanded the knowledge of this framework across five provinces in South Africa.

The table below summarizes provinces, areas, and village-level LGs involved in this research process.

Table 3: Village-based CRA learning groups involved in this research.

Province	Organizational support	Area	Villages	No of participants
KZN	MDF	Bergville	Ezibomvini, Stulwane, Vimbukahlo, Eqeleni, Emadakaneni	130
	MDF	Midlands	Ozwathini, Gobizembe, Mayizekanye, Ndlaveleni	110
	MDF	SKZN	Mahhehle,Mariathal, Centocow, Ngongonini	90
	Wildtrust	Zululand	Nkovukeni, kwaDapha and Mabibi	60
Limpopo	AWARD	Sekororo-Letsitele	Sedawa, Turkey, Willows, Santeng, Worcester, Madeira, Sofaya	130
	WRC	Giyani	Mayephu	50
EC	ERS	Matatiele	Ned, Nchodu, Nkau, Rashule,	75
Gauteng	Sociotech	Hammanskraal	Maubane	55
Northern Cape	LIMA	Upington	Blouberg	40
5		**9**	**30**	**740**

3.1.2 Communication and innovation

The meso-level interactions of communication and innovation through clusters of learning groups in different areas and local and regional stakeholders were undertaken through learning and sharing processes and events, collaborative implementation, cross-visits, webinars, conferences, and stakeholder forums.

The table below provides examples of activities related to these topics. These lists are not exhaustive but are meant to provide insight into the range and intensity of activities undertaken to support the dissemination of information and innovation at local and regional levels.

Table 4: Dissemination activities for the CbCCA process 2022-2025

Dissemination	No	Description	Comment
Conferences: Papers presented	12	SAMC23, SAMC24, 9WCCA, LaRSSA25, SANBI Gender dialogue, WISA, F4CJ, WITS Rural Science colloquiums	Papers presented under the following topics: Conservation Agriculture, water and resources stewardship, gender mainstreaming, CRA, and supported self-supply water access options and governance
Training, National and International	1	World Vision Germany	November 2024. Climate Resilient Agriculture-Approaches, practices, and first-hand insights across development interventions. Presentation of the case study for South Africa in the online training event
Newsletter articles	5	SANBI, AN, LL	Article topics included: Gender mainstreaming, CRA, food systems, CA, and wetland rehabilitation
Stakeholder workshop presentations	6	NDC, CCC, AN	Topics explored in these multistakeholder forums included CbCCA, Local fire management, Water, and natural resources stewardship
Non-Government Organisations	15	INR, ERS, LIMA, DUCT, Sociotech, AWARD, CSA, EWT, MN, Wildtrust, Dlalanathi, Zeor2Five, Lulamaphiko, Zingelulwazi, K2C, SPP	Sharing of methodologies and resources. Provision of materials and inputs, training, and co-implementation services to these NGOs
Government Organisations	10	LMs, DMs, DARD, DFFE, SANBI, DRM	Sharing of methodologies and resources. Provision of materials and inputs, training, and co-implementation
Online platforms	3	AN, A4F, GLSCRP	CCA-DSS aspects were explored online on these platforms and resources, handbooks, and pamphlets were co-produced.
Universities and research organisations	8	Rhodes, UKZN, Cape Town, Pretoria, Western Cape, Northwest, Free State, SAEON/EFTEON,	Sharing of case-studies and joint research was undertaken in: ecosystem services, climate services, regenerative agriculture, CRA, resilience impact measurement, and rural livelihoods
Private sector	6	Zylem, Afritrac, Alzu, Avipharm, AGT-Foods, Forge Agri	Targeted assistance in input supply, training, after-sales support, and farmer-level trials from agri-business companies

3.1.3 Multistakeholder platforms

The research team participated in several multistakeholder platforms, networks, and CoPs to disseminate the CbCCA platform and participate in regional and national processes that would augment the research process. The main aim of these interactions was the incorporation of the CbCCA platform into local and regional planning processes for both civil society and government. These interactions were also important to develop methodological coherence for the themes explored in this research brief and contributed to the case studies developed.

The table below outlines a selection of these multistakeholder interactions undertaken. It is not an exhaustive list, but

Table 5: Planning and multistakeholder interactions for the CCA-DSSII research process (2022-2025)

Organisation	Activity - Description
Asset Research- Maize Trust, SODI	Regenerative Agriculture: farmers' open days, national and regional events, innovation platforms, and publications.
Zylem and Regen-Z (sustainable agriculture company, KZN)	Collaboration in farmer-level experimentation with the application of liquid supplements for soil health and testing of new climate-adapted maize varieties. The aim was to move towards organic and regenerative CA practices through this 3-year collaboration, working with a living laboratory approach and twenty farmer participants in the on-farm trials
Ecosystem services research (WRC)	UKZN-CWRR research in ecosystem services mapping supported by MDF: This provided a mapping and adaptive planning mechanism for implementation at the community level and has now been incorporated into further collaborations, which include UKZN, SAEON/EFTEON, Wildtrust, and MN Farmer-level cross-visit between Hlatikhulu and Bergville communities involved in community-level resource management and EbA activities (EWT and MDF)

Organisation	Activity - Description
WWF Water source forum (NDC)	uThukela catchment partnership for improving water and natural resources stewardship in the catchment with ~100 members from all sectors – community, civil society, private and commercial role-players, universities, and government. Stakeholder meetings, online and in person at the OLM board room, Bergville (new name: Northern Drakensberg Collaborative). Development of vision, membership profile, constitution, and core team, and full collaborative meetings. Multistakeholder field days, as well as thematic workshops, including fire management in the catchment as examples. Joint proposal development and partnership development for members of the NDC, including joint implementation, sharing, and learning, were undertaken. Initiation of the CCC (Cross-Catchment Collective) – a 7-catchment learning and capability development project (funded by the Lewis Foundation)
SANBI- Living Catchment Programme	Social facilitation capacity building workshop – Western Cape. Olifants' Water Indaba – Limpopo and a video on local initiatives in catchment management SANBI Catchment Indaba-Kleinmond Western Cape
SANBI	Climate change adaptation and gender mainstreaming dialogues – planning, presentation, and participation SANBI newsletter- runoff impacts of restoration and CA 'EbA farm' – Adaptation fund planning with SANBI
Adaptation Network	Policy input, participation in PCC working groups, and AGMs Ongoing input and involvement in the Capacity Development Working Group: to implement the new Civil Society Organization Skills Enhancement and Excellence Development (CSO SEED) project, funded by the Flanders Government. Meetings with AN to discuss capacity building and outline CCA training for the NGO - Sociotech. in Hammanskraal AN newsletter: Food systems article AN-Colloquium (Cape Town): Dialogue and presentation on CC vulnerability assessments and MERL frameworks.
PGS-SA	Quarterly meetings: Discuss mapping of PGS organisations, finalisation of certificate and use of seals and logos. Finalisation of smallholder farm assessment forms PGS-Certification Working Group participation. Online market development training: Input into session five
Okhahlamba LM	Agriculture and Land Summits: Presentations and marketing stalls. Okahlamba LED forum meetings OLM – support with transport for farmers' markets and tractors for field preparation Okhahlamba Agricultural shows
Afromontane Research Centre	Maloti-Drakensberg Climate Change Workshop Wageningen/UFS: Land futures course – Bergville (facilitated by Free State University)
WRC-AWARD	Giyani Local Scale Climate Resilience Project (GLSCRP) Support for CCA and VSLAs Water governance and infrastructure management community dialogue in Mayephu, Giyani – for the development of guidelines and proof of concept WRC- reference group meetings for: Enterprise development and innovation for rural water schemes- GLSCRP Mopani District water dialogue linked to GLSCRP
Umzimvubu Catchment Partnership (UCP) and ERS	Webinar to review CRA and spring protection implementation and plan for future projects Planning for combined spring protection in Nkau Multistakeholder governance inputs Farmer-level cross visits and provision of training in CRA to communities in Matatiele-EC
Karen Kotshcy	Learning in the M&E interest group meeting. Discussions re methodology for UCP and Tsitsa project multistakeholder engagement evaluation and development of M&E framework and indicators for climate impact Development of climate-resilient indicators for CbCCA Climate resilience dashboard development

Publications have included presentations on online platforms, conference papers, newsletter articles, case studies, and reports. These publications have all been peer-reviewed by experts. They are considered popular articles and have not been published in peer-reviewed journals.

A non-exhaustive list of publications is provided below.

1. Solidarity practices during climate crises: Collaboratively exploring opportunities with women agroecologists. A case study of the Natal Midlands. August 2023. Farming for Climate Justice: Transforming policy and practice towards agroecological transitions for resilient and just food

and farming systems in a changing climate. Coventry University, MDF, Zingela Ulwazi- Social networks and transformation. https://www.mahlathini.org/our-work/water-research-commission-climate-change-adaptation-for-smallholder-farmers-in-s/f4cj-climate-change-presentation-with-cc-impacts/

2. Climate change adaptation and livelihoods enhancement learning event in Maobane (Hammanskraal). 7-8 August 2023. MDF, Adaptation Network, and Sociotech. https://www.mahlathini.org/our-work/water-research-commission-climate-change-adaptation-for-smallholder-farmers-in-s/an-cso-seedclimate-change-adaptation-and-livelihoods-enhancement-learning-event-/
3. Local Food systems: A case study on smallholder farmers in Ozwathini, KwaZulu-Natal. Adaptation Network Quarterly Newsletter Issue 3. October 2023. https://www.mahlathini.org/our-work/water-research-commission-climate-change-adaptation-for-smallholder-farmers-in-s/an-newsletter-article-understanding-local-food-systems-temakholo-mathebula/
4. Training outline for LIMA RDF Social Employment Fund food gardening component. 9 Villages across three provinces. August 2023-January 2024. https://www.mahlathini.org/our-work/water-research-commission-climate-change-adaptation-for-smallholder-farmers-in-s/training-outline-for-lima-sef-food-gardening-component/
5. Amanzi for Food platform. Rhodes University. MDF-WRC Materials shared on their social learning platform as part of ongoing collaboration. August 2024. https://amanziforfood.co.za/sociallearning/
6. Smallholder decision support system_Mahlathini_Adaptation Network Climate Information Tools. 2024. https://adaptationnetwork.org.za/climate-information-tool/
7. Mopani District Municipality Water dialogues 2024: Rural water innovation and governance: Addressing water supply, climate challenges, and governance in rural areas of the Mopani District. October 2024. https://www.mahlathini.org/our-work/water-research-commission-climate-change-adaptation-for-smallholder-farmers-in-s/mopani-water-dialogue-2024-report/
8. GLSCRP- Giyani Local Scale Climate Resilience Project. A range of brochures, pamphlets, guidelines, and reports. February 2025. www.glscrp.org.za
9. Women and youth-led Conservation Agriculture.26 May 2025. https://livinglakes.org/women-and-youth-led-climate-resilience-project-drives-regenerative-agriculture-and-wetland-restoration-in-south-africa/

3.2 DISCUSSION OF RESULTS

The results of the micro, meso, and macro-level aspects of this research have been developed as loose-standing case studies, handbooks, and guidelines. These documents include the learning and recommendations for the specific thematic areas covered in each. In the following chapters of this report, each of these documents and products is briefly discussed and summarised. The tables of contents for the documents are also presented to provide a detailed overview of the content of each.

The products developed are as follows:

- The Decision Support Platform and farmer-level handouts (Chapter 4)
- Microfinance for smallholder farmers handbook and case studies (Chapter 5)
- CbCCA and local food systems handbook and case studies (Chapter 6)
- Climate resilience Impact Measurement for Rural Communities: A MERL manual for CbCCA (Chapter 7)
- Community-owned water access guidelines and case studies (Chapter 8) and
- Multistakeholder platform development guidelines for successful implementation (Chapter 9).

These documents have been made available on the MDF website in the interim (https://www.mahlathini.org/our-work/water-research-commission-climate-change-adaptation-for-smallholder-farmers-in-s/) and will also be published through the WRC within six months of project finalisation.

CHAPTER 4: THE DECISION SUPPORT PLATFORM

This aspect of the research process consisted of three interlinked activities:

- On the ground testing of further practices in CRA and W&NRM
- Inclusion of these further practices into the DDS community-level facilitation and individual online platforms and
- Development of farmer-level learning materials for all practices included.

During the initial phase of this research, the focus was primarily on agricultural and water conservation practices in gardening, field cropping, and fruit production, with an initial focus on livestock integration. In this round, conceptualisation has now included the broader landscape, moving to the concept of CbCCA, which includes community-level water and resources management and livestock integration. This includes both a change in the participatory methodology for intervening with the CRA village-level LGs as well as the inclusion of a range of new CRA practices. It needs to be noted that the practices presented here are by no means exhaustive. Practices under each category are summarised in the table below.

These practices are presented as 1-page summaries in a PowerPoint to allow for a quick overview and introduction both for individuals and in workshop sessions (https://www.mahlathini.org/our-work/smallholder-decision-support-system/wrc-cca-practices-updated/).

The further practices, refined through farmer- and community-level experimentation included in this research brief, are summarized in the table below.

Table 6: CRA practices included in the DSS (2022-2025).

Livestock integration	Water access and management	Natural resource management	Field cropping
Social-ecological mapping and adaptive planning			
Multipurpose breeds – poultry	Self-supply options (springs, streams, boreholes)	Erosion control: Stone lines, brush packs, check dams, re-seeding,	Plant bio stimulants: to reduce external inputs and improve crop growth and resistance to abiotic stress.
Fodder production	Governance	Alien clearing	Improved crop varieties
Nutrients from fodder	Low-tech spring protection options	Wetland rehabilitation and restoration: Building concrete, earthen or gabion structures to arrest erosion, trap sediment, and re-wet drained wetland areas. Plugging artificial drainage channels. Addressing other causes of degradation, such as poor agricultural practices and invasive alien plants. Providing convenient livestock watering points	
Protein block making	Access road and low-level bridge maintenance	Grazing management – maintenance of fences and cattle paths	

Two examples of the one-page summary for one of the practices are shown below.

Multipurpose breeds-poultry

- Rainfall: >250mm/year
- Temperature: >5°C, <40 °C

- Livestock
- 0,1-1ha >1ha
- Medium cost, local resources,
- Labour and knowledge intensive

DESCRIPTION

- A need for poultry breeds that are heat-tolerant, generally tough in the face of different stresses, and multipurpose.
- Multipurpose means a breed that is good both for laying and for meat.
- Need breeds that can be locally reproduced and can thrive on locally produced feed rations
- The Boschvelder (www.boschveld.co.za) is a multipurpose breed originating from Limpopo and is a cross between the Venda, Ovambo, and Matabele chickens.
- They can continue laying eggs for at least two and a half years with inbred disease resistance and hardiness. The roosters are ready for slaughter at 12 weeks, with hens ready to lay eggs at 18 weeks.

Boschveld chickens perform well if provided clean and suitable housing with some free- range options. They should be provided with high quality feed Meat from these chickens is comparable to conventional broilers.

Boschveld chickens lay as well as conventional layers if provided with the correct feed, ample water and good laying boxes. They contin ue to lay for around 2 years,

Figure 2: The one-page summary for Multipurpose poultry breeds in the CRA practices PowerPoint.

Spring protection in wetlands

- Rainfall: >350mm
- Topography: 1, 5% -15%
- Soil: all types

- Natural resource management: water access, erosion control
- 0,1-1ha >1ha
- Medium cost, easily accessible resources,
- Labour and knowledge intensive

DESCRIPTION

- **Informal spring protection is** where the intake is protected with gravel/ stones, a weir is built and the area is fenced, rather than the more formal v-box construction. This is important for both local spiritual reasons and for protecting the integrity of the spring's eye.
- The eye is the point where the water emerges from the ground. An intake chamber is usually built around this point. The silt chamber allows for settling of sediment. An upper outlet draws cleared water out and a lower outlet scours and cleans out sediment from the tank. The storage chamber stores the water or directs to larger storage structures. It needs an overflow.
- A surface water drainage ditch is dug above and around the spring area to divert surface water run-off from polluting the source. This should be dug a minimum of 8m from the source, preferably further away if possible. The area should then be fenced to keep animals and people out of the area.

Above: Header tanks and communal taps for storage and reticulation

Above left to right: A spring in a wetland ,protected with an open-V gravel structure and weir with two overflow pipes back into the wetland, and which was fenced to protect the source and keep water uncontaminated.

Figure 3: the one-page summary for spring protection in wetlands in the CRA practices PowerPoint.

The online DSS tool has been designed to rate each of the practices included using two sets of criteria:

- Agro-ecological criteria and
- Socio-economic criteria.

Criteria used in the DSS and described in detail in the Facilitation Manual (https://www.mahlathini.org/dss/resources/wrc-cca-facilitation-manual/) are: proxies for the physical environment, farming system, farmer typology, resources and management strategies, and facilitator scores. Each parameter was coded as 1, if relevant to a particular practise, or 0 if not, to make

subsequent additions and changes easy to manage. Basically, each practice was compared with each of the above-mentioned criteria/ parameters and then scored (adding the number of 1s together), to provide a prioritised listing in the DSS according to the criteria chosen by the particular individual.

The agro-ecological criteria, which are scored for each practise, with a few illustrative examples, are shown in the small table below.

Table 7: Agro-ecological criteria and scores used in the online DSS tool.

		Criteria for confining the selected practices based on farmers' typology, physical environment, and farming system (if practice not constrained = 1)																			
		Proxies for physical environment													Farming system				Typology		
		AEZ			Soil texture				Soil OC			Slope									
Practice	**Images (PPT-CA practices)**	Tropics semi-arid warm	Subtropics semi-arid warm	Subtropics cool sub-humid	Sandy soils	Loamy soils	Clayey soils	Silty soils	<0.5%	0.5-2%	>2%	<5%	5-15%	>15%	Field cropping	Vegetable gardening	Livestock	Tree and other nat. resources	A	B	C
Bucket drip kits	Bucket drip kits	1	1	1		1	1	1	1	1	1	1				1			1	1	
Furrows and ridges/furrow irrigation	Furrows and ridges	1	1	1			1	1	1	1	1	1			1	1			1	1	1
Greywater management	Greywater management	1	1	1	1	1	1	1	1	1	1	1	1	1		1			1	1	

The proxies for the physical environment are open-source external databases linked to this Excel sheet to geographically identify the individual's agroecological zone (AEZ), soil texture, soil organic carbon (SOC), and slope.

The Agroecological zone dataset used is: HarvestChoice; International Food Policy Research Institute (IFPRI), 2015, "Agro-Ecological Zones for Africa South of the Sahara", https://doi.org/10.7910/DVN/M7XIUB/, Harvard Dataverse, V3. The sites currently covered in this study are located in three of these 12 AEZs: Tropics semi-arid – warm, sub-tropics semi-arid – warm, and subtropics sub-humid – cool. Semi-arid regions in South Africa are characterised by mean annual precipitation between 200 mm and 400 mm, and the sub-humid regions by mean precipitation between 400 mm and 1 100 mm.

The geographical distribution of these AEZ was delineated based on the average climate between 1961 and 1990, using the data from the Climate Research Unit (CRU) at the University of East Anglia and the data from VASClimO (Variability Analysis of Surface Climate Observations), a joint climate research project of the German Weather Service (Global Precipitation Climatology Centre – GPCC) and the Johann Wolfgang Goethe University in Frankfurt (Institute for Atmosphere and Environment – Working Group for Climatology). The data can be accessed from the http://gaez.fao.org/ website. Slope gradient data at around 1 km resolution have also been made available on this website.

The four soil texture classes were defined based on the clay silt, and sand fractions taken from the AfSoilGrids 250 m soil database (https://www.isric.online/projects/soil-property-maps-africa-250-m-resolution/) and further regrouped as follows:

- Sandy soils: sand, loamy sand.
- Silty soils: silt.
- Clayey soils: clay, sandy clay, and silty clay.
- Loamy soils: silty clay loam, clay loam, loam, silty loam, sandy clay loam, sandy loam.

This dataset also provides values for the soil organic carbon.

For the farming system category, the individual chose one or more of the categories of field cropping, vegetable gardening, livestock, trees, and other natural resources.

The farmer typology was based on an individual's responses related to several socio-economic criteria: gender, dependency ratio, level of education, access to water and electricity, employment status, total income, market access, farming purpose, and farm size, and depending on the answers, placed the individual in typology A, B, or C. See Table 6.

The Socio-economic criteria and their score for each practice are shown below for a few illustrative examples.

Table 8: Socio-economic criteria and scores used in the online DSS tool.

	Criteria for selecting practices based on the resources to manage and related strategies (=1)													**Score by expert/facilitator**				
	Resources and management strategies																	
	Water (quantity)			**Soil (fertility)**		**Crop resistance and efficiency**				**Livestock resistance and efficiency**				**Resources (Score 0 - 3; level of importance of the resource in the practice)**				
Practice	**Harvesting**	**Retention**	**Use efficiency**	**Conservation**	**Improvement**	**Water**	**Heat**	**Nutrient**	**Disease**	**Water**	**Heat**	**Nutrient**	**Disease**	**Water**	**Soil**	**Crop**	**Livestock**	**CSA**
Bucket drip kits			1			1								3	0	2	0	1
Furrows and ridges/furrow irrigation			1	1		1								3	2	2	0	0
Greywater management			1			1								3	0	2	0	0

In addition, each CRA practice was given a resource management rating based on four resources, namely: water, in particular, quantity (1); soil, in particular, fertility (2); crops (3); and livestock (4), in particular, efficiency and resistance for both. Efficiency refers to the conversion of water, nutrients, or land into the required output, such as biomass per unit area of land cultivation or seed generation of the plant itself. Resistance relates to crops or livestock that are, for example, better adapted to drought or heat conditions or better protected against diseases, etc.

The final step in the prioritisation process was the provision of an expert score for how well each practice could fulfil the management criteria chosen. This expert score was developed by the research team.
The DSS tool has been updated to include all practices for both the initial and follow-up phases of the research and refined to include further agroecological zones, notably the hot-arid regions, including the Northern Cape and the temperate sub-humid regions around Gauteng. It means that the tool is now representative of most of the agroecological zones in South Africa (https://www.mahlathini.org/our-work/smallholder-decision-support-system/).

In addition, farmer handouts have been prepared in English, isiZulu, isiXhosa, and Sepedi. These handouts provide descriptions of each of the CRA practices that have been tested and that are included in the database. They are designed for use in workshops and learning sessions and can easily be printed out, either as a complete booklet or just using the relevant pages for a particular session.

Below is a sample page from the farmer's handouts in each of the four languages as an example.

1.1 INFILTRATION PITS/ BANANA CIRCLES

Basins are dug in the soil along water flow lines (to catch and slow water). These basins are filled with organic matter (large amounts) mixed with soil, and bananas or other water-loving crops are planted in the basins

A variation of this is that one pit or basin is dug in a water flow line and slowly filled with organic matter (green and manure)- for slow composting. Here, bananas or other crops are planted on the edges.

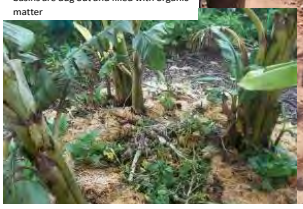
REQUIREMENTS

- Rainfall: >350mm/year
- Temperature: >5°C
- Topography: 1,5%-25%
- Soil: all types (5-30% clay) and depths (>30cm)

IMPLEMENTATION

- Gardens
- <0,1ha,
- Low cost, local resources
- Easy to do and maintain, labour-intensive

Smaller, separate basins can be made; basins are dug out and filled with organic matter



A mulched banana circle, mixed with herbs

Step wise basins along a drainage line in a homestead garden. Tied ridges are made between the basins

1.1 IMINGXUMA YOKUTSHONISA AMANZI/YENZIWA NGEZANGQA ZOOBHANANA

Indawo ezikhongozeley ezembiwa emhlabeni ongeneno kwamanzi ahambayo (ukubamba kunye nokunciphisa isivinini sokubaleka kwamanzi). Eziziza ziye zigcwaliswe ngomgquba okanye izifundisi (ngobuninzi bazo) sixutywe nomhlaba nababhanana okanye ezinye izithelo ezithanda amanzi ziye zityalwe kweziziza.

Umahluko wale indlela kukuba umgxunya ngamnye wenbiwe endaweni ebaleka amanzi kwaye izalisekiswe ngezizivundisi (okuluhlaza okanye umgquba) - kuchula kuhle nokuvundisa. Apha ke iibhanana okanye ezinye izivuno zityalwa emingqibekweni.

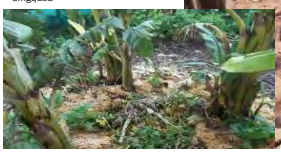
IIMFUNEKO

- Imvula: engaphezulu kwamakhulu amathathu anamatshumi amahlanu yeelilitha ngonyaka (>350mm/year)
- Amaqondo obushushu: angaphezulu kwesihlanu (>5ºC)
- Impandle: Kubekunye ukuya kumatshumi amabini anesihlanu (1.5%-25%)
- Umhlaba: kungaba lulo lonke uhlobo lemihlaba (kubesisihlanu ukuya kumatshumi amathathu epesenti zomdongwe (5-30% clay) kunye nobunzulu obungaphezulu kwamatshumi amathathu (>30cm)

UPHUNYEZO

- Kufanele ubenegadi
- Angango 0.1 wehectare ubukhulu bendawo
- Kusetsenziswa izixhobo zasekuhlaleni, futhi indleko/amaxabiso aphansi
- Kulula ukuqonda wenze nokukugcina, ubunzima busemsebenzini ekumele wenziwe

Iindawana, ezahlulwelwe ukukhongozela amanzi zingenziwa, ngokugrunjwa kuphinde kungezwe umgquba



Isangqa sikabhanana esidityaniswe nohlaza.

Isiza esikhongozele amanzi senziwe mayelana nomsele wokuhambisa amanzi egadini yasekhayeni. Imimmango edityanisiweyo yenziwe Phakathi kwemisele.

IZIMBOBO ZOKUNGENA KWAMANZI / AMA-CIRCLE EZAMABHANA

Izindishi zimbiwa enhlabathini lapho kubonakala ukuthi amanzi ahamba khona(ukuze abanjwe kuohinde kuncishiswe nesivinini sawo). Lezi "ndisi" zigcwaliswa ngezinto ezibolayo ezivela ezitshalweni noma ezilwaneni. Enxube iphinde ixutshwe nomhlabathi ebese kutshwalwa izitshalo ezithanda amanzi ezifana nobhanana

Enye indlela yokwenza lokhu ukumba "indishi" lapho kuhamba khon amanzi ebese okubolayo kufakwe kancane kancane ukuze kuzobola kancane kancane. Lapha ubhanana utshalwa emphethweni noma onqenqemeni lwe "ndishi"

Okudingayo

- Imvula engaphezulu kuka 350 mm ngonyaka
- Amazinga okushosa nokubanda angahezulu kuka 5°C
- Ubume bendawo : 1.5% -25 %
- Umhlabathi: lonke uhlobo (5-30% ubumba) nokujula okungaphezulu kuka 30 cm

Ukwenza

- Ezingandini
- Endaweni engaphansi kuka 0.1 ha
- Izindleko ziphansi, izinsiza zitholakala endaweni
- Kulula ukwenza nokugcina esesimweni, inomsebenzi omuningi

Izindishi ezincane zingenziwa, ziyambiwa mase ugcwaliswa

Indilinga kabhanana embozelwe kwase kufakwa nezinongo

Izindishi ezime sasitebhiso lapho kuhamba khon amanzi ensimini. Amatied ridges enziwa phakathi kwazi "ndishi"

MELETE YA TSENELETŠA MEETSE/ GODIKOLOGA GA BANANA

Melapo epiwa mobung hleng le Ditsela tsa go sepidisa meetse (go tshwara le go fokotsa lebelo la meetse). Melapo e, e tshwanetse go tshelwa ka dibolwa tse dintšhi tse di hlakantshitsweng le mobu le dibanana kgotsa ka go bjala di bjalo tse di ratang meetse mo melapong.

Phapano ya melete e, ke gore o tee goba molapo e epiwa ka gare ga ditsela tsao laola meetse, ya tla e tlatsišwa ka dibola (tse di meetsi le morole) gore dira di bodiša. Mo go bjalwa dibanana kgotsa mehlre e mengwemo morumong.

DINYAKWA

- Pula: >350mm/ngwaga
- Thempheratšha: >5°C
- Boemo ba naga: 1,5%-25%
- Mobul: mehuta ka moka (5-30% clay) and depths (>30cm)

DIDIRISWA

- Dirapa
- <0,1ha,
- Theko ya tlase; mothopo wa kgauši
- O bonolo go dira le go boloka; mošomo o boima

Melapo e menyane e ka dirwa; melapo ya epiwa, e be e tlatsiswa ka dibodudi

Godikologa ga banana e e bipeditšweng, e hlakanthsitswe le metlang

Melapo gotee le tsela/moela wa go sepidiša meets. Meboto e e kgokaganeng e diriiwe magareng ga melapo.

Figure 4: A farmer's handout page on infiltration pits/banana circles in English, isiXhosa, isiZulu, and sePedi.

CHAPTER 5: MICROFINANCE FOR SMALLHOLDER FARMERS: HANDBOOK AND CASE STUDIES

5.1 SUMMARY

A handbook has been developed exploring microfinance options for smallholder farmers, discussing the necessity, theories, and practicalities of these informal systems that have developed. It focuses on the village savings and loan associations (VSLA) model that MDF has implemented as a detailed example through a qualitative study where we examined microfinance options that are available for smallholder farmers participating in the Community-based Climate Change Adaptation (CbCCA) programmes and drew lessons for broader applications.

Microfinance is the provision of financial services such as savings, loans, and insurance to people who are too poor to qualify for financial services from formal financial institutions (Wrenn, 2007). We explored experiences of members participating in Village Savings and Loans Associations (VSLAs) in the villages where Mahlathini Development Foundation implements community-based climate change adaptation. Human-Centred Design (HCD) was used in the study to examine different group-based financial services, identify challenges, and dissect microfinance options that savings groups present to smallholder farmers. Data was generated through in-depth interviews followed by seven focus group discussions in selected rural communities in KwaZulu-Natal and Limpopo provinces.

The study found that group-based savings provide opportunities for integrating VSLAs into smallholder farming and the rural enterprise development agenda. This is because VSLAs provide an alternative and structured system for providing accountable and transparent financial services that is backed by decades of practice and has a good track record for the attainment of tangible livelihood outcomes. However, this study concludes that further research is still required to use the wealth of experiences of group-based savings in designing additional responsive financial services for smallholder farmers.

A micro enterprise case study has also been included to explore sustainable livelihoods, food security, climate sensitive farming, financial services for small-scale farmers, and promotion of enterprise development interventions. These interventions underpin strategic development initiatives meant to address poverty, underdevelopment, and ecosystem challenges in Africa. Savings groups and farm-based microenterprises are being widely promoted as crucial steps toward economic empowerment, sustainable livelihoods, and conservation restoration. This case study reports on factors that contribute towards the greater success of farm-based enterprises that are operated by eighteen participants in the Climate Resilient Agriculture (CRA) programme implemented by Mahlathini Development Foundation. The study concludes that focused savings groups that employ Village Savings and Loans Association (VSLA) methodology provide a springboard for participants to improve their incomes through starting and operating farm-based microenterprises and income-generating activities. The study also concluded that participants engage in non-farming income-generating activities to supplement their farming incomes and better their livelihoods.

In the sections below, summaries are provided of the chapters for this manual.

5.2 CHAPTER SUMMARIES

5.2.1 Background

The financial services system in South Africa is complex and highly unequal. Formal financial institutions such as banks and government agencies are designed to serve individuals and businesses that have stable incomes, assets, and formal records. However, smallholder farmers, particularly those

in rural areas, remain excluded from these systems. Even though government institutions such as DARD, the Land Bank, the Development Bank of South Africa (DBSA), and the Small Enterprise Finance Agency (SEFA) provide financial services, most smallholder farmers struggle to access them because of high transaction costs, strict lending requirements, limited financial literacy, and a lack of collateral.

Smallholder farmers also face increasing uncertainty due to climate change. Droughts, erratic rainfall, soil degradation, and pest outbreaks raise production risks and reduce lenders' willingness to provide credit. This creates a situation where farmers who most need financial support are the least able to obtain it. As a result, they rely heavily on informal financial systems and community-based institutions. Village Savings and Loan Associations (VSLAs) are one such institution. These groups provide smallholder farmers with a way to save money, access credit, and manage risk without depending on formal banks. The chapter highlights that VSLAs are not just financial tools, but also learning spaces that build entrepreneurship, discipline, and financial management skills within communities. Financial inclusion is a key requirement for sustainable development. It allows households to smooth consumption, cope with shocks, and invest in productive activities. For smallholder farmers participating in climate change adaptation programmes, access to flexible financial services is especially important. Climate change makes farming more unpredictable, increasing the need for savings, insurance, and short-term credit.

The chapter explains that adaptive planning approaches are needed to connect community-based financial institutions with climate change adaptation initiatives. VSLAs provide a mechanism for linking planning, implementation, and evaluation at the household and community levels. They allow farmers to save and borrow in ways that align with planting seasons, harvests, and climate risks.

The study, therefore, focuses on understanding how VSLAs and similar informal financial institutions operate in practice and how they can be used to strengthen climate-resilient farming systems in South Africa.

5.2.2 Community-Based Microfinance Services

Community-based financial institutions are a lifeline for millions of poor and vulnerable households. These institutions operate within the informal economy, which includes unregistered enterprises and community organisations that make up the broad base of economic activity in developing countries.

The informal economy is not a marginal space but a core part of how people survive and support themselves. Community-based financial institutions are deeply embedded in this economy. They allow households to save money, access loans, and manage risks in ways that formal institutions cannot. These groups are built around common bonds such as shared residence, occupation, or family ties. These bonds create trust, discipline, and mutual accountability, which are essential for managing money collectively. They also help reduce risks related to loan default and mismanagement.

Two main types of informal microfinance institutions exist: Rotating Savings and Credit Associations (ROSCAs) and Accumulating Savings and Credit Associations (ASCAs). ROSCAs, also called merry-go-rounds, involve members contributing equal amounts of money and taking turns to receive a lump sum. This system is simple and effective for meeting large expenses. They require no fund management and involve no interest.

ASCAs are more complex and allow savings to grow through interest on loans. VSLAs are a form of ASCA and provide a structured way for members to save, borrow, and accumulate assets. Interest earned on loans grows the fund, which is shared among members at the end of a cycle. VSLAs are self-managed groups where members save regularly, buy shares, and use the accumulated fund to

provide loans to each other. At the end of each cycle, all funds are shared among members in proportion to their savings. VSLAs are designed to be accessible to very poor households. Share prices are set low, and members decide on all rules collectively. This ensures transparency, ownership, and sustainability.

In South Africa, community-based financial institutions include burial societies, grocery stokvels, savings and credit groups, investment groups, and multi-functional groups. Each serves different purposes, from managing funeral costs to investing in businesses.

South African law recognises the importance of informal financial institutions. Stokvels, burial societies, and savings groups are exempt from licensing under the FAIS Act and the Bank Act. This means they can legally provide financial services to their members without being registered as banks. This legal recognition allows community-based financial institutions to operate freely and protects them from unnecessary regulation that could undermine their effectiveness.

5.2.3 Methodologies of community-based microfinance services

This section explains the main ways community-based microfinance is provided in South Africa, focusing on three approaches: microfinance NGOs, rotating savings groups (ROSCAs), and accumulating savings groups (ASCAs), specifically VSLAs.

Microfinance NGOs are not-for-profit financial institutions that provide small loans to poor and excluded populations. In South Africa, key organisations include the Small Enterprise Foundation (SEF), Marang Financial Services, and the Women's Development Businesses Group (WDB). These organisations serve rural women and micro-entrepreneurs. International NGOs such as CARE, World Vision, Oxfam, and Catholic Relief Services also operate globally using similar models. These organisations are funded by donors and governments and are governed by boards rather than regulated by central banks. Their main strength is their experience in structuring financial services and reaching people who are excluded from formal banking systems.

Most microfinance NGOs use the solidarity group model, pioneered by the Grameen Bank. Under this system, small groups of borrowers guarantee each other's loans. If one member fails to repay, the whole group is responsible, and no one receives further loans until the debt is cleared. In this way, social pressure replaces physical collateral. This allows NGOs to lend to very poor people who do not own assets.

The Social Enterprise Fund (SEF), founded in 1992, is one of the largest microfinance NGOs in South Africa. It operates in seven provinces and provides loans to rural women running small trading businesses such as fruit and vegetable stalls, clothing sales, dressmaking, and spaza shops. By 2022, it had more than 175,000 borrowers with an average loan size of just over R30,000. SEF does not run savings groups, but it requires borrowers to save money in a group account at the Post Office for financial discipline and security.

The Phakamani Foundation works in Mpumalanga, Limpopo, and KwaZulu-Natal and lends to rural women using the solidarity group approach. Women must go through training and selection before receiving a loan. Marang Financial Services emerged after the collapse of earlier rural finance institutions and now operates in five provinces, providing loans of up to R10,000 to people without bank collateral. WDB focuses on empowering rural women and offers two levels of lending: small starter loans combined with basic training, and larger loans for more advanced entrepreneurs who receive mentoring and business support.

Although microfinance NGOs have helped many poor people access credit, they share several common weaknesses. They depend on donor funding, have no shareholder capital, and are caught between social development goals and financial sustainability. Their main product is credit, not savings, even though savings are more important for poor households. They encourage group savings accounts, but they do not offer community-controlled savings systems.

Researchers have strongly criticised this credit-focused model. Many argue that it traps poor people in debt and extracts high interest from the very poor. Studies show that poor households are cautious borrowers and need savings to manage life events such as illness, funerals, and school fees. Small loans also create too much competition among micro-businesses, making it hard for borrowers to earn meaningful profits, especially in agriculture.

An alternative approach has been piloted by NGOs such as the Lima Rural Development Foundation, which runs an interest-free revolving credit fund for smallholder farmers through the government-backed Jobs Fund. Farmers receive inputs rather than cash and repay after selling their produce. While this has helped farmers, it is expensive and difficult to manage because NGOs lack the financial systems of professional lenders.

ROSCAs, also known as merry-go-rounds or self-help groups, are the simplest form of savings groups. Members contribute a fixed amount and take turns receiving the full amount. There is no interest, no fund to manage, and minimal record-keeping. These groups are very popular because they are simple and trusted.

ASCAs are more advanced savings groups. Members save regularly into a group fund, which is used to provide loans to members. Loans earn interest, which grows the fund. Borrowing is optional, but the group must trust borrowers to repay. VSLAs fall into this category.

VSLAs are structured savings-led financial groups. Members agree on a share price and an interest rate at the start of a cycle. Each member buys between one and five shares per meeting, though some groups allow more. The share price is kept low so even poor members can participate. Savings build the group fund, which is used for small loans by the members. Interest and fines are added to the fund. At the end of the cycle, all money is shared out among members according to how much they saved.

MDF uses the VSLA model because it is owned and controlled by the members. Groups save first and then lend their own money. There are no external loans, so there is no risk of debt traps or money flowing out of the community. Interest stays within the group. Members run all operations themselves, including record-keeping and money management. Facilitators only provide training and support. This creates strong trust, transparency, and financial discipline.

Overall, this section shows that while microfinance NGOs have expanded access to credit, savings-led models like VSLAs are more sustainable, less risky, and better suited to poor rural households and smallholder farmers.

5.2.4 Making connections

This section explains how Village Savings and Loan Associations (VSLAs) are integrated into MDF's Community-based Climate Change Adaptation (CbCCA) approach and how this model fits closely with African cultural values and rural development practice. MDF works in KwaZulu-Natal, Eastern Cape, and Limpopo to support poor rural households through an integrated approach that combines climate-resilient agriculture, water management, food systems, environmental rehabilitation, livestock management, and local economic development. Its development philosophy is based on the idea that people, their environment, and their economies must function in harmony for communities to become resilient and prosperous.

MDF's work is grounded in agro-ecological principles and participatory learning. It partners with other non-profit organisations and communities to design food and nutrition security programmes that strengthen livelihoods and support long-term sustainability. Instead of imposing solutions from outside, MDF emphasises social learning, community participation, practical training, and ongoing support. This allows rural households to improve food production, protect natural resources, and increase their incomes in ways that are appropriate to their local conditions.

A key part of this integrated approach is the use of VSLAs. These savings groups are not treated as separate financial projects but are built into food production, climate-resilient farming, and entrepreneurship development. VSLAs serve two critical functions for smallholder farmers. First, they help households to smooth consumption by allowing people to save money and access loans when

income is low or unpredictable. Second, they provide access to capital that farmers can use to buy seeds, tools, water-harvesting equipment, and other inputs needed for farming and small businesses. Community-based farmer centres further strengthen this system by making small quantities of affordable agricultural inputs available locally, reducing costs and delays for farmers.

MDF has deliberately adapted the VSLA model to support the goals of climate-resilient agriculture. Climate-resilient farming seeks to increase yields while protecting soil and water resources and adapting to climate change. VSLAs complement this by providing farmers with flexible financial services that allow them to invest in production, grow nutritious food, and start small enterprises. Short-term loans and end-of-cycle lump-sum payouts help households cope with food shortages, invest in farming activities, and diversify their income sources. The promise of real financial benefits encourages farmers to participate more actively in climate-resilient agriculture programmes.

This approach also fits well with African cultural values. In African societies, culture is based on shared beliefs, norms, and practices that emphasise cooperation, reciprocity, and mutual support. Traditional systems encouraged people to help one another with farming, house building, and other labour-intensive activities. Savings groups reflect this same spirit of collective responsibility and mutual aid.

Zulu traditions such as ukwenana, ukusisa, and ilimo illustrate this clearly. Ukwenana involves exchanging goods with the understanding that the favour will be returned. Ukusisa involves lending livestock, such as a cow, so that the recipient benefits from its offspring before returning it. Ilimo is a system where a household invites others to help with planting or harvesting and repays them with food and a share of the harvest. These practices are based on equality, trust, and reciprocity. VSLAs operate in a similar way by creating shared financial resources that benefit all members and strengthen social ties.

Internationally, the VSLA model has been widely adopted and has proven to be effective in supporting poor and vulnerable populations. Since the early 1990s, organisations such as CARE have promoted VSLAs in more than fifty countries, reaching millions of people. VSLAs help households deal with irregular incomes, improve access to financial services, stimulate local economies, and build resilience against shocks such as illness, drought, and disasters. Members save regularly, borrow when needed, and receive their accumulated savings plus interest at the end of each cycle. Strong governance, transparency, and record-keeping are essential for success, and many groups receive training and support from development agencies during their early stages.

In South Africa, informal savings groups are commonly known as stokvels, and the VSLA model has been adapted to fit this context. Organisations such as SaveAct, MDF, the Farmer Support Group, Africa Cooperative Action Trust, and Zimele have promoted VSLAs as part of their development programmes. Thousands of people across multiple provinces now participate in these groups. Members save monthly, lend to one another, and grow their savings through interest. Training in financial management, life skills, farming, and small business development is often provided alongside the savings programme.

South African NGOs prefer the VSLA model because it builds on existing stokvel traditions and cultural practices, making it widely accepted by communities. It is savings-led, meaning no external loans are required, which reduces financial risk. Money stays within the group and the community rather than flowing out to external lenders. VSLAs also serve as platforms for broader development, helping communities organise around issues such as food security, water access, income generation, and asset building. In this way, VSLAs become a central tool for strengthening rural livelihoods and resilience in the face of climate change and poverty.

5.2.5 Community-based informal financial services study

This chapter examines how poor rural households, particularly smallholder farmers, manage money in environments where formal financial systems are either absent, unaffordable, or exploitative. The research focuses on VSLAs operating in communities supported by MDF's CbCCA programme.

The core finding is that VSLAs are not simply savings clubs. They function as locally governed financial institutions, learning spaces, and social safety nets that help rural households survive, adapt, and slowly

build assets. While banks and microfinance institutions view financial inclusion in terms of accounts, credit, and insurance products, rural people define inclusion as having cash when it is needed for food, farming, emergencies, and dignity. VSLAs succeed because they are embedded in trust, reciprocity, discipline, and collective responsibility—values deeply rooted in African social systems.

The study aimed to understand how rural people experience and use informal finance rather than relying on theory or policy narratives. It sought to explore what VSLA members learn from participation, how their livelihoods change compared with stokvel or bank users, and whether VSLAs offer meaningful microfinance options for farmers who must cope with seasonal income, climate shocks, and household needs. The research explored how internal group dynamics and external pressures shape the operation of VSLAs; whether VSLA practices improve livelihoods; what kinds of learning and collaboration take place inside groups; and what financial options VSLAs realistically provide to smallholder farmers.

The study used an interpretivist, human-centred design approach, which allowed participants to explain their own realities and financial behaviour. Instead of imposing outside models, researchers observed how people saved, borrowed, planned, and managed money inside their own systems.

Participants came from rural KwaZulu-Natal and Limpopo - areas marked by poverty, limited markets, and dependence on farming and social grants. Data was collected through VSLA records, observations, interviews, and focus groups over six months. Thematic analysis revealed deep patterns of social learning, cultural practice, and financial behaviour.

The data show that women dominate community-based finance, reflecting their responsibility for household survival.

Table 9: VSLA participants' gender and age (n=50).

Gender		**Marital Status**		**Age**		
Women	Men	Single	Married	18–35	26–55	55+
44	6	23	27	11	20	19

This confirms that most VSLA members are middle-aged and older women, many of whom support extended families. These households included 172 adults and 181 children, yet only 165 children received government grants, increasing financial strain. Despite poverty, participants manage complex financial portfolios.

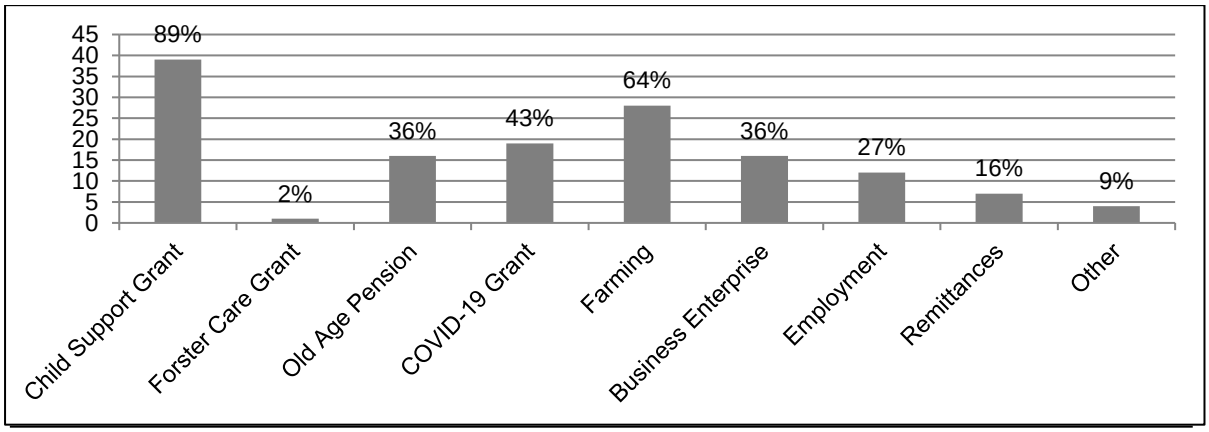


Figure 5: Sources of income of the participants.

Every participant received an average of R4 787 from state and non-state sources monthly, distributed across the following categories:

- Government grants: 78% of households
- Farming and mixed enterprises: 19.4%
- Other income: 2,6%

The buying food accounts for almost half of all expenditure (46.4%), indicating why households constantly face cash shortages. Yet participants still spend 19% of their income on financial services, mainly VSLAs and stokvels.

Participants use a range of formal and informal financial services to survive, as indicated in the table below.

Table 10: Financial services used by participants

Type of Financial Service	%
MDF-supported VSLAs	52,5
Other groups, e.g., stokvels	25,6
Funeral parlour policies and burial societies	13,2
Life insurance with a formal insurer	2,9
Savings accounts with banks	5,8

This shows that community-based finance dominates rural financial life far more than banks.

People use VSLAs not just to save but to manage large life-cycle expenses. Participants specifically used VSLAs to finance their farming enterprises, traditional ceremonies, house construction and/or renovations, furniture, and appliances. Short-term loans and savings that would have earned interest at the end of the savings group were used for the following annual expenses.

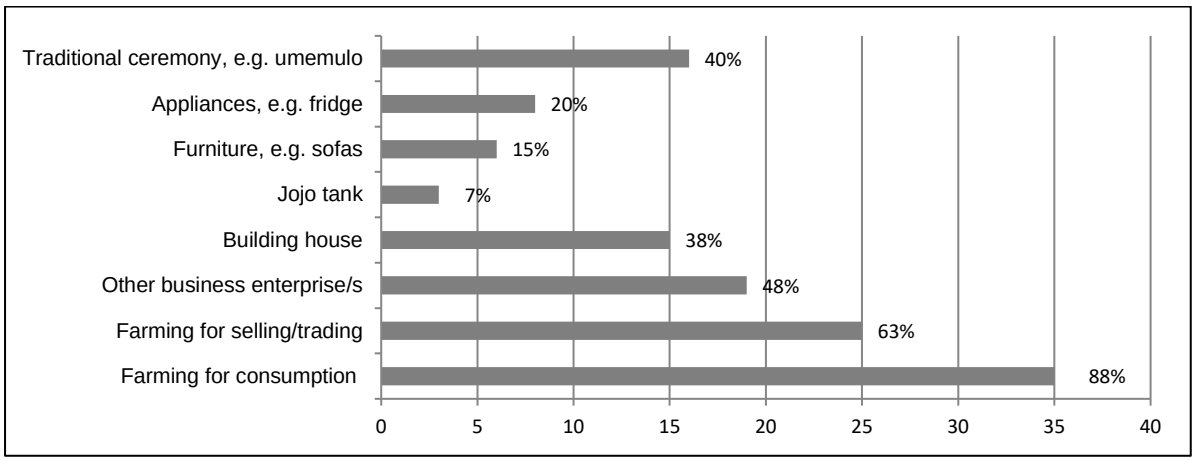


Figure 6: Total spend of share-out lump sums on different annual activities.

The annual share-outs also provide lump sums for larger expenditures, according to the following categories:

- Traditional ceremonies – 35.1%
- House construction & renovation – 21.2%
- Food production – 15.9%
- Farming enterprises – 12.9%
- Other enterprises – 7.4%

This pattern reveals that social obligations and housing are as important as farming, with each category accounting for around 30-35% of their expenditure.

Ten categories across three themes emerged through coding of the data for different focus areas, as shown in the table below.

Table 11: Focus, categories, and themes deduced from data.

Focus	Category	Theme
• Evaluation of past and present challenges • Prediction of the future • Defining success indicators	• Conundrum of financial inclusion • Design for use • Perspectives in financial education	**Social intelligence competency**
• Critical understanding of the complexity of development • Emancipatory knowledge • Exploration of new possibilities • Building relationships and partnerships	• Liberatory perceptions about community-based financial institutions • Reciprocity and social currency • Partnerships • Drivers for participating in community-based financial institutions	**Cultural competency**
• Transformative interventions • Problem-solving frameworks • Responding to change • Socio-economic values • Controlled money channels • Personal and business loans	• Social learning spaces • Selective non-formal learning • Scaffolding and knowledge transferability	**Collaborative learning competency**

With reference to the social intelligence competency, VSLAs work because members trust each other, enforce rules, and plan together. Financial inclusion for participants means being able to get cash when needed, without having a bank account. Banks are viewed as extractive: "*If you put R1 000 in a bank, you never get it all back.*" In contrast, VSLA meetings follow clear routines that ensure discipline. Because loans come from members' own savings, repayment is taken seriously. Defaulting harms everyone.

With reference to the cultural competency, savings groups reflect African traditions of ilima, ukusisa, and ukwenana, where people support each other through labour, livestock, and shared resources. Women use VSLAs to manage food, children's needs, and ceremonies, building both financial and social capital. They bulk-buy groceries, seeds, and fertiliser, and share transport costs. Savings groups are not about becoming rich; they are about living with dignity.

With reference to the collaborative learning competency, VSLAs function as 'schools of money'. Members learn:

- How to budget
- How to delay gratification
- How to compare prices and
- How to manage debt.

Knowledge spreads through stories, observation, and discussion.

Key lessons from this study include that the VLSAs succeed because they are locally controlled, low-cost, culturally aligned, and based on trust.

This study supports the general understanding that microfinance options for smallholder farmers also include other options, which are shown and compared in the table below.

Table 12: Summary of financial options for smallholder farmers.

	Microfinance Service			
	Traditional Stokvels	**Microfinance NGOs**	**Revolving credit provided by non-financial institutions**	**VSLAs**
Advantages	This is the most understood and used group savings vehicle. It offers several options based on ASCA and ROCSA models. Interest earned benefits the members. There is an appetite for and experience of using transaction bank accounts. These groups have extensive buying experience. Social capital and social bonds tend to harmonise the operation of these groups. Social capital also discourages loan delinquency.	Resource mobilisation is the sole responsibility of the NGO. Operating systems mimic formal banks. Loan terms can be extended to 12 months. Collateral is not required for a loan; however, a group must guarantee loans granted to individual members.	Resource mobilisation is the sole responsibility of the NGO. Proof of access to production land, size of the land, proven production capacity, and commodity demand are used as criteria for loan approval. Collateral is not required for an applicant to qualify for a loan.	Social capital and social bonds tend to harmonise the operation of these groups. Social capital also discourages loan delinquency. Collateral is not a requirement for getting loans. Members have total control of their group fund. Operating procedures and rules are in place. This model can be adapted to make it possible for members to extend loan terms and savings cycles beyond a year. The VSLA model provides multiple options for the bulking of loans and the use of some bank products.
Risks	Fixed mentality, such as annual cycles, consumption focus, and some practices that disadvantage silent voices, tends to weaken this model. There have been reports of fraudulent activities by leaders of some groups.	Establishment and operations are the highest cost drivers, which may translate to expensive microloans. There may be resistance in communities with a long history of traditional stokvels and VSLAs. A microfinance NGO may run at a loss.	Provision of loans and recoveries is very expensive because they are included in the salaries of field staff. Absence of capacity in the NGO impacts negatively on the management of the revolving credit fund. These NGOs may operate outside the provision of the National Credit Regulator (NRC), which may make it harder to deal with delinquent borrowers.	Group funds are kept in the village. This exposes VSLA to elements of criminality; however, this can be circumvented by depositing excess money into the bank account.
VSLA Limitations	Besides the fixed annual cycles, poor members tend to avoid taking out loans, and in the few cases when they do, they are only very small consumption loans.	Solidarity loan guarantees may be rejected by the VSLA. An externally provided loan may be incompatible with the VSLA.	Opportunities for integration are yet to be explored.	There could be misalignment between planting seasons and the availability of sufficient loans for farmers. 12-month savings cycles and shorter loan terms limit VSLAs' ability to grow their group funds and to provide larger loans.

This analysis further supports the need to explore options to improve the VSLA methodology to better serve farmers. Production VSLAs, integrated savings, and Bulk Loan Funds to allow larger, longer-term loans aligned to planting seasons are proposed.

In conclusion, VSLAs are not poor people's version of banks. They are community institutions that combine finance, learning, culture, and resilience. They allow smallholder farmers to feed their families, invest in production, survive shocks, and slowly build assets—something formal finance has consistently failed to deliver in rural South Africa.
When integrated into climate-resilient agriculture and development programmes, VSLAs become one of the most powerful tools for sustainable rural livelihoods.

5.2.6 Governance and Operation of VSLAs.

This chapter explains how VSLAs are organised, governed, and run in practice. It shows that VSLAs are not informal or chaotic systems, but carefully structured community institutions governed by constitutions, clear rules, and collective accountability. They are built on trust, transparency, and participation, allowing rural people to manage money safely in places where banks and formal financial institutions are often inaccessible or unsuitable.

VSLAs are usually formed by people who already know and trust one another—neighbours, relatives, friends, and members of the same community. Groups are kept relatively small, usually no more than thirty members, to make management easier and to maintain strong relationships. While VSLAs are self-managed, they are often supported by non-governmental organisations such as MDF, which provide training, facilitation, and supervision. In South Africa, VSLAs are commonly used by smallholder farmers, informal traders, livestock owners, water committees, and other self-help and livelihood groups that need flexible access to cash.

Every VSLA is governed by a written constitution that defines its purpose and operation. This constitution sets out who can join, how long the savings cycle lasts, how much members save, how loans are issued and repaid, how the social fund works, and what happens when rules are broken. It also specifies how leaders are elected and what their responsibilities are. This makes the group accountable to itself rather than to an external authority.

Each VSLA elects a management committee at the start of every savings cycle. This committee includes a chairperson, a record keeper, a money-box keeper, and two money counters. The chairperson ensures meetings run smoothly and that rules are followed. The record keeper maintains accurate written records of all savings, loans, and balances. The money-box keeper keeps the locked cash box safe between meetings but never opens it alone. The money counters handle all cash during meetings and announce all totals publicly so that every member can see and verify what is happening. Although the committee has specific roles, all members are responsible for enforcing rules and maintaining honesty and discipline.

Participation in a VSLA is not passive. Members are expected to attend all meetings, arrive on time, buy at least one share at each meeting, and follow the group's rules. A member must save to qualify for loans, and loans are limited to twice the value of a member's shares. Loans are short-term, usually repaid within three to four months, with interest charged at about 10% per month. This structure encourages discipline while allowing people to borrow meaningful amounts relative to their savings.

VSLA meetings follow a strict and transparent routine. Members sit in a semi-circle so that everyone can see the money, records, and transactions. Each person has a savings book that records their deposits, loans, and repayments. All group funds are stored in a steel money box with three separate locks, and the keys are held by three different people to prevent fraud. The box can only be opened in front of the group.

Meetings begin with formalities such as checking attendance and collecting social fund contributions. Members then buy shares (their savings), repay outstanding loans, and apply for new loans. All transactions are conducted openly, with money counted several times and totals announced aloud. At the end of the meeting, closing balances are confirmed so everyone knows exactly how much money the group has.

Many VSLAs also run a social fund. This is a small emergency fund built from equal contributions by members and used to support anyone facing serious hardship, such as illness, death, or disaster. Unlike

loans, social fund payouts do not have to be repaid, reinforcing solidarity and mutual support within the group.

At the end of each savings cycle, the VSLA holds a share-out meeting. This is when the entire group fund – made up of savings, interest, and fines – is distributed to members. All loans must first be settled, and if a member cannot repay, their shares are used to clear the debt. The total money in the fund is then divided by the total number of shares to determine the final value of each share. Each member receives an amount based on how many shares they own. This process ensures fairness and rewards consistent saving and responsible borrowing.

Training is an important part of VSLA success. Groups receive training on how to establish themselves, write constitutions, manage funds, and run meetings. Additional training is given to groups that operate a social fund. The main attraction of VSLAs is that they provide reliable access to cash for food, farming, school fees, emergencies, house improvements, and small businesses – needs that banks rarely meet for poor rural households.

MDF supports VSLAs through regular monitoring and supervision. Field staff attend meetings, check records, provide advice, and identify areas where members need more training. This ongoing support helps groups remain transparent, disciplined, and aligned with broader development goals. VSLAs work best when they are part of a wider development strategy rather than isolated financial projects

The chapter concludes that VSLAs should always be integrated into broader community development programmes such as MDF's climate-resilient agriculture work. They should build on what people already know, trust, and practice, rather than replacing local systems. Stronger links with NGOs, government, and even banks could help create financial products that better serve VSLA members, especially smallholder farmers. In this way, VSLAs can continue to strengthen local economies, improve resilience, and give rural people more control over their financial lives.

5.2.7 Good Practice and Success Factors.

This chapter explains why VSLAs have worked well in the MDF programme and what makes them successful as tools for rural development and smallholder farmer support. At the centre of this success is the way the methodology has been adapted to fit local realities rather than being imposed as an external financial model. Communities have embraced VSLAs because they build on practices that people already understand, such as stokvels and other informal savings systems. The familiar structure of saving regularly, borrowing when needed, and receiving a lump sum at the end of a cycle matches the financial rhythms of rural households. Clear rules, strong supervision, and ongoing coaching help members unlearn harmful practices that sometimes exist in informal groups, such as poor record keeping, misuse of funds, and weak discipline.

A major reason for success is the use of a phased approach in developing VSLAs. Groups do not become strong and independent overnight. They move through stages of establishment, close supervision, and eventual maturity. During these phases, members gradually learn how to save consistently, manage group funds, issue and repay loans, and use part of their money for productive activities such as farming and small businesses. This staged process allows mentors and facilitators to identify learning gaps and provide the right support at the right time, helping groups grow in confidence and competence.

VSLAs also function as powerful platforms for learning. Members do not only learn about money, but also about cooperation, leadership, accountability, and problem-solving. Because VSLAs are linked to broader community development programmes, members are also drawn into learning about food production, nutrition, water management, environmental restoration, and income generation. The savings group becomes a central hub where new knowledge is shared, tested, and applied in everyday life. This collective learning strengthens both individual households and the wider community.

Another important success factor is the way VSLAs make it easier to scale development efforts. Once people feel ownership of their groups, they become more motivated, disciplined, and responsible. This creates an entry point for NGOs to introduce additional training and development activities. The VSLA methodology is simple enough for even less-literate members to understand and use, which ensures

that no one is excluded. As a result, learning and development can spread more widely and deeply than through formal training alone.

VSLAs also tend to grow and reproduce themselves naturally. After each savings cycle, new members join existing groups or form new ones. Experienced members often help to mentor new groups, spreading good practice within the community. This self-replication shows that people value the system and trust it. However, it also means that NGOs need to keep track of new groups so that they can continue to offer training, guidance, and support, ensuring that standards and good practices are maintained.

The chapter also looks at how VSLAs for smallholder farmers can be strengthened. While the VSLA model works well for saving and small loans, many farmers need larger amounts of money and longer repayment periods to invest properly in farming. For example, producing one hectare of maize can cost around R10 000, which is more than what most VSLA loans currently provide. To address this, farmers should be encouraged to reinvest part of their lump-sum share-outs back into their groups to build larger loan funds. Loan terms should be extended to up to twelve months, with lower annual interest instead of high monthly rates. Savings cycles could also be lengthened to three to five years, allowing funds to grow instead of being paid out every year. Using bank accounts to hold larger sums would also make VSLA finances safer and more flexible, especially when dealing with bigger loans.

Finally, the chapter highlights the importance of long-term support from donors and external organisations. VSLAs do not thrive on their own; they need continuous mentoring, supervision, and integration into broader development programmes. NGOs require funding not only to train groups but also to build partnerships with banks, develop appropriate financial products, link farmers to markets, and support climate adaptation, conservation, and enterprise development. When this wider support is in place, VSLAs become much more than savings clubs—they become powerful engines for resilience, food security, and sustainable rural livelihoods.

5.2.8 Case Study – VSLAs and Livelihoods.

This chapter examines how VSLAs influence the livelihoods of smallholder farmers and rural entrepreneurs in KwaZulu-Natal and Limpopo. The study focused on members of LGs who participated in VSLAs and compared them with similar farmers who did not. The central question is whether VSLAs help people move beyond survival toward more productive, diversified, and resilient livelihoods.

Smallholder farmers, especially women, play a major role in food production in South Africa, yet they face serious obstacles in accessing production capital, especially credit for farming. NGOs such as the Mahlathini Development Foundation (MDF) have responded by combining farmer learning groups with VSLAs, giving farmers access to both knowledge and finance. The study investigated how VSLA membership affects enterprise activity, income levels, and household assets.

The research used the Sustainable Livelihoods Framework and qualitative methods, including focus groups and interviews with 65 LG members across eight villages in KwaZulu-Natal and Limpopo. This approach allowed the voices and experiences of participants to shape the findings. The study population was largely female, reflecting the reality that women are the main drivers of household food production.

Table 13: No of participants in the livelihoods survey, November 2023.

Participants	KZN	Limpopo	Total
Total study participants	56	9	65
Women	50	7	57
Men	6	2	8
Total non-VSLA participants	14		14
Women	12		12
Men	2		2

Most participants in the LGs were adult women (87,7%) and men (12,3%). However, 21,5% of LG members did not participate in the VSLA programme. About 27,7% (eighteen participants) were above 60 years old.

Almost 88% of participants were women, and more than one-fifth were over the age of sixty. This shows that VSLAs are particularly important for older women who support extended families. Importantly, about 22% of the sample did not belong to VSLAs, which made it possible to compare outcomes between VSLA and non-VSLA households.

The study found that most households depend on multiple income sources. While government grants remain very important, most participants were also economically active, where:

- 60% were farming (vegetables, maize, eggs, broilers)
- 22% were trading (tuck shops, food vending, clothes)
- 12% were manufacturing (beads, mats, baking) and
- 57% were receiving state grants (pensions, child support).

This shows that farming is the backbone of rural livelihoods, but many households diversify into trading and small manufacturing to survive. A key finding of the study is that VSLA members earn much higher incomes than non-members.

Table 14: Average annual income (Rands)

Category	VSLA members	Non-VSLA members
Non-farm income (grants, remittances)	R19 042	R20 658
Farming income	R34 243	R8 598
Retail & trade	R21 000	R3 000
Manufacturing & services	R6 825	R143
Total income	**R81 110**	**R32 399**

While both groups receive similar grant income, VSLA members earn far more from farming, trading, and other businesses than non-members. VSLA members generate more than two and a half times the total income of non-members. This difference is even clearer when expressed in percentages, as shown in the table below.

Table 15: Percentage difference in income

Category	VSLA share	Non-VSLA share	Difference
Farming income	82%	18%	+64%
Retail & trade	88.9%	11.1%	+77.8%
Total income	78.9%	21.1%	+57.8%

These figures show that VSLA participation is strongly associated with higher productive income, substantially reducing grant dependency.

The study also examined how people use their money. VSLA members use both their business incomes and their VSLA withdrawals for a mix of production, household improvement, and social obligations in the following categories:

- Farming and enterprises
- House construction and renovation
- Traditional ceremonies
- Funeral and social security
- Household consumption.

VSLA members also invest much more of their money in productive activities than non-members.

Table 16: Productive use of income

Category	VSLA members	Non-VSLA members	Difference
Productive use (all)	89.5%	10.5%	+79%
Farming investment	84.9%	15.1%	+69.7%

This shows that VSLA members are far more likely to reinvest money into farming and enterprises. They use loans and share-outs strategically: some for consumption smoothing, others for buying seeds, chickens, fencing, tunnels, and trading stock. Participants described how they recycle income between activities. They might take a short-term VSLA loan to trade or sell goods quickly, use the profit to repay

the loan, and then invest in farming. Many save aggressively to buy more shares so they can qualify for larger loans when they need them for major expenses like houses or ceremonies.

The study also documented a wide range of assets owned by VSLA members: fenced gardens, broiler cages, water tanks, kraals, tunnels, tuck shops, brick houses, furniture, and appliances. These assets reflect improved quality of life and stronger livelihood security.

However, challenges remain. Smallholder farmers struggle to measure their production and incomes accurately, especially when much of the food produced is consumed rather than sold. VSLA loans are short-term and often too small for serious farming investments such as maize production. Because farmers rely on non-farm income to repay loans before harvest, loans are not always well aligned with agricultural cycles.

The study concludes that VSLAs significantly strengthen livelihoods by enabling people to save, invest, and diversify income. However, for farmers to reach the next level, VSLAs need larger loan pools, longer repayment periods, and better alignment with agricultural production cycles. This requires NGOs to invest in training, loan bulking, and financial innovation so that VSLAs can move from survival finance to genuine development finance for rural farmers.

5.2.9 What makes small-scale farming enterprises succeed?

This chapter investigates why some small-scale farmers supported by MDF manage to build sustainable, profitable, and resilient farming enterprises while others struggle. It is based on in-depth case studies of eighteen farmers participating in MDF's CbCCA and VSLA programmes in KwaZulu-Natal and Limpopo. The study showed that the success of these farmers does not come from a single factor but from the interaction between savings groups, production practices, learning, social networks, and household survival strategies.

The farmers in this study do not operate businesses in the narrow commercial sense. Their enterprises are deeply embedded in household life. Income from farming is used to feed families, support livestock, pay school fees, improve housing, and cope with illness, drought, and funerals. For this reason, success is not measured only by profit, but by whether a household can remain food secure, avoid debt, and reinvest in the next season. This reality explains why farmers mix farming with non-farming income-generating activities such as tuck shops, baking, and garment making.

Two case studies illustrate this well. MaMkhize, a widowed farmer, combines vegetable production, maize, broilers, egg layers, and a tuck shop. Using water from a protected spring and a borehole, she produces vegetables all year round. Over the past year, she earned about R87 000 from farming and R48 000 from her tuck shop, giving her a total income of R135 000 and a net profit of about R43 000, or R3 600 per month. She was able to access about R13 000 from her VSLA to finance inputs, chickens, and seeds. Her story shows how savings groups, irrigation, training, and diversification combine to produce stability and growth.

Figure 7: Pictures showing production facilities in MaMkhize's homestead.

Bab'Mlangeni, on the other hand, is not part of a VSLA but runs a highly active farming operation with his wife. They grow vegetables for town markets, keep pigs and cattle, and use maize mainly for household food and animal feed. They exchanged cattle for a vehicle, which improved their access to

markets. They earned about R62 000 in the last year with a net profit of about R42 000. His case shows that assets, market access, and family labour can also create success, even without savings groups, although VSLA members had more reliable access to capital.

Figure 8: Pictures showing production facilities in Bab 'Mlangeni's homestead.

When the researchers examined how all eighteen farmers invested their money, they found that in a single year, about R593 300 was mobilised to run both farming and non-farming enterprises. About 59 percent of this went into non-farming activities and 41 percent into farming.

This pattern reflects the reality that farmers depend heavily on non-farming income to stabilise household cash flow while waiting for crops to mature. Importantly, about 35 percent of this capital came from VSLAs, showing how critical savings groups are as a source of operating finance. Looking more closely at farming investments, vegetables, broilers, eggs, and maize were the main commodities produced. Vegetables produced the highest profits because they require relatively low one-off costs and generate quick returns. Broilers and eggs produced moderate profits but required continuous expenditure on feed. Maize, although widely grown, often showed losses in financial terms. Yet farmers continued growing maize because it feeds households and livestock and reduces the need to buy food. From the farmers' perspective, maize was not a loss but a form of insurance.

When average earnings were calculated, farmers who invested about R13 000 across several farming activities earned R29 000, resulting in an average net gain of about R16 000 per year, or R1 300 per month. This shows that even small amounts of recycled capital can significantly improve household incomes when managed across multiple enterprises.

Non-farming enterprises played an equally important role. Activities such as tuck shops, garment making, baking, and household trading provided faster cash than farming. Tuck shops and retailing generated large volumes of income, while garment making produced the highest profit margins relative to capital invested. These activities helped households repay VSLA loans, buy food, and invest back into farming. At the same time, some farmers worried that non-farming work reduced the time they could spend on their fields, highlighting the delicate balance between farming and trade.

One of the strongest success factors across all farmers was access to VSLA finance. When sources of capital were analysed, about 35 percent of all operating capital came from savings groups, with the rest coming from personal income and grants. VSLAs allowed farmers to turn small, regular savings into lump sums and loans that could be invested in seeds, livestock feed, fencing, irrigation, and trading stock.

However, the study also shows that VSLAs have limits. Loan sizes are small and repayment periods short, which does not always match crop cycles. Farmers with diversified income sources were more willing to borrow, while poorer farmers were more cautious.

Training and the adoption of CRA practices were another major driver of success. Farmers who received regular supervision from MDF extension officers improved their yields, managed water better and planned production more effectively. Women farmers in particular reported that CRA practices helped ensure constant food availability and small but regular incomes. Social networks formed through Farmer Learning Groups and VSLAs also mattered greatly. These platforms allowed farmers to bulk buy inputs, share transport, set common prices, and reach urban markets. They also created spaces for learning and mutual support.

Overall, the chapter shows that successful small-scale farmers are not gamblers chasing high profits. They are cautious, disciplined, and resilient. They combine farming, trading, saving, and learning to secure food for their families, generate income, and slowly build assets. Through VSLAs, CRA practices, and strong networks, they transform small savings and small farms into sustainable livelihoods.

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5.3 TABLE OF CONTENTS: MICROFINANCE HANDBOOK

Below is the table of contents for this handbook.

CHAPTER 6: CBCCA AND LOCAL FOOD SYSTEMS: HANDBOOK AND CASE STUDIES

In this handbook, we provide contextualized case studies (both place- and issue-based) as well as recommendations for the transformation of local food systems, based on a framework for transformation of food systems developed from literature.

The case studies include:

- Local food system analysis for smallholder farmers in the Midlands region of KwaZulu- Natal and
- Improved resilience for smallholder farmers in CbCCA.

Chapter summaries for this handbook are provided below.

6.1 CHAPTER SUMMARIES

6.1.1 Contextual framework

Numerous studies suggest that the transformation of food systems is crucial in the enhancement of food security, livelihood creation, environmental sustainability, and economic transformation. In these unprecedented times, a holistic approach is vital in driving systematic shifts in both global and local food systems (United Nations Environment Programme (UNEP), 2016). Daunting challenges such as soil degradation, loss of biodiversity, climatic shifts, and food-related diseases require deep structural reforms in food systems. As food systems are a major contributing factor in the creation of the existing challenges, they are instrumental in finding solutions.

Food system reform requires strategic solutions and strong collaboration between all the actors involved (Global Alliance for the Future of Food, 2021). According to the Framework for Researching African Food Systems (May, 2021). Food system transformation is vital in achieving Sustainable Development Goals (SDGs), especially SDG 2, which aims to end hunger by enhancing food security through the promotion of sustainable agricultural practices.

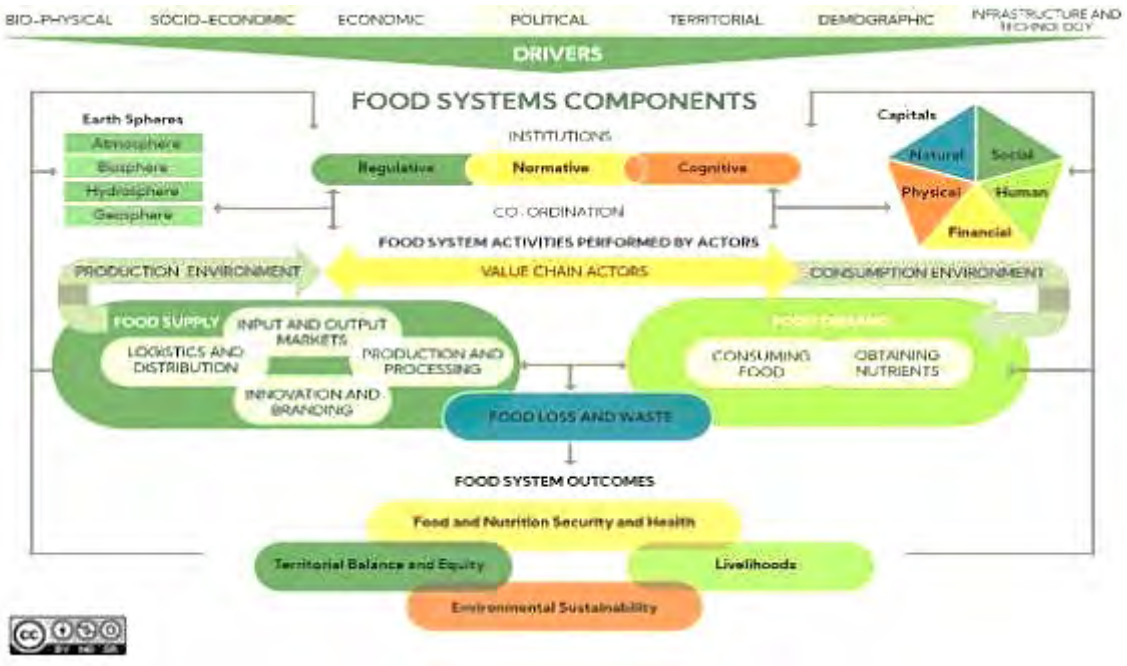


Figure 9: The Food Systems Framework outlined by FS Net Africa – Prof J. May 2021.

To identify opportunities for transformation, frameworks for change provide a conceptual structure for challenging existing paradigms and birthing new ideas and solutions. Frameworks are tools to "understand, analyse, and shift systems" and can be applied in multi-contextual ways (Nesheim, Oria, & Yih, 2015). Therefore, a food systems framework is an important tool in assessing and strengthening food systems, as it provides an empirical structure for analyzing the food system components and identifying gaps and points of intervention (FAO, European Union, CIRAD and DSI-NRF Centre of Excellence in Food Security (CoE-FS), 2022).

A desktop review of various journal articles, research papers, and presentations on food systems has revealed several food system frameworks for transformation. Most food system frameworks have three defining components: external drivers as tools for change, description of the various components of food systems, and outcomes. The Global Alliance (GA) has introduced a "Principles Framework for Food System Transformation," which is composed of seven principles: renewability, resilience, health, equity, diversity, inclusion, and interconnectedness. These principles are the outcome of sustainable food systems, which encompass a future of biodiversity, access to healthy food, and resilience to shocks and stresses (Global Alliance for the Future of Food, 2021). The framework works by assessing food system alignment to the principles using a set of predetermined criteria. The GA framework views the food system components in retrospect and helps to identify misalignment, thus providing guidelines for future decision-making.

Another framework is the "Sustainable Food Systems Transformative Framework," which is a three-tiered framework of drivers, activities, and outcomes. This framework provides a more detailed breakdown of the various food systems' components and thus provides a wider scope of analysis of challenges and opportunities for intervention. The framework helps to assess the processes and information pathways in food systems, identify gaps, and find ways to improve food system governance. This is the main framework that will be adapted and used for this study.

The third framework to be used in this study is the "Framework for Researching African Food Systems," adapted from the TRANSMANGO framework, which provides a conceptual overview and the linkages in food systems. This framework is useful in identifying the different levels at which food systems operate and can transform. It is a detailed framework of the food system drivers and components, and helps with an in-depth analysis of processes, interactions, and feedback loops (Brunori, et al., 2014).

A recent food systems profile for South Africa (FAO, European Union, CIRAD and DSI-NRF Centre of Excellence in Food Security (CoE-FS), 2022), has identified several levers that drive the transformation of the food system to one that can provide for improved livelihoods, environmental sustainability, and a better territorial balance.
In summary, these levers are:

- **Reduce the relative cost of nutrient-dense food and modify the consumer environment**
- Increase the range, scale, and coverage of child-centred food system interventions in the built environment
- **Support the transition towards agroecological food systems**
- Link land reform with place-based farmer support
- Reform and enforce food system regulatory policies
- **Adopt an integrated approach to building an inclusive food system**
- **Improve inclusive stakeholder participation and enhance engagement and**
- **Adopt a two-pronged place- and issue-based approach to food system governance**.

The work and research undertaken by MDF and our development partners have focused primarily on the five levers in bold in the list above. We have worked within the 7 principles outlined by the Global Alliance for the future of food (Global Alliance for the Future of Food, 2021), namely renewability, resilience, health, equity, diversity, inclusion, and interconnectedness.

The approach has been to improve the resilience of smallholder farmers' livelihoods despite multiple shocks and stresses. A further focus on the development of local food systems and local marketing strategies alongside microfinance products for the rural poor has been undertaken.

MDF has worked extensively to strengthen local food systems in KwaZulu-Natal, Eastern Cape, and Limpopo. The organisation's project focus has been to reduce vulnerability and increase resilience to

external shocks such as climate change, economic decline, food insecurity, and political instability, which are particularly detrimental to the poorest of the poor. Further complicating matters is the reality that smallholder farmers do not have access to formal credit, are excluded from the mainstream economy, struggle with high levels of unemployment, and are food insecure. The disproportionate distribution of power between men and women also continues to be a point of major concern, although the tide is slowly turning. There is, therefore, a necessity for interventions that will drastically reduce and possibly eradicate the aforementioned challenges. Our project activities have included the introduction of sustainable agricultural practices, which encompass agro-ecology and regenerative agriculture principles, to help strengthen the farming systems of smallholder farmers, alongside local marketing, and microfinance and microlending options. More recently, an increased focus on soil and water conservation, as well as resource conservation and management, has also been included in the suite of interventions.

In efforts to better understand local food systems as well as their challenges and opportunities, the organisation has applied the food systems approach, in which a framework was used to identify the primary external drivers, the interactions between the various components of the food system, as well as the actors involved, the outcomes, and the impacts. This food system framework is adapted from Sustainable Food Systems Transformative Network, The Global Alliance Network, and the TRANSMANGO Network and presented below.

MDF FOOD SYSTEMS FRAMEWORK

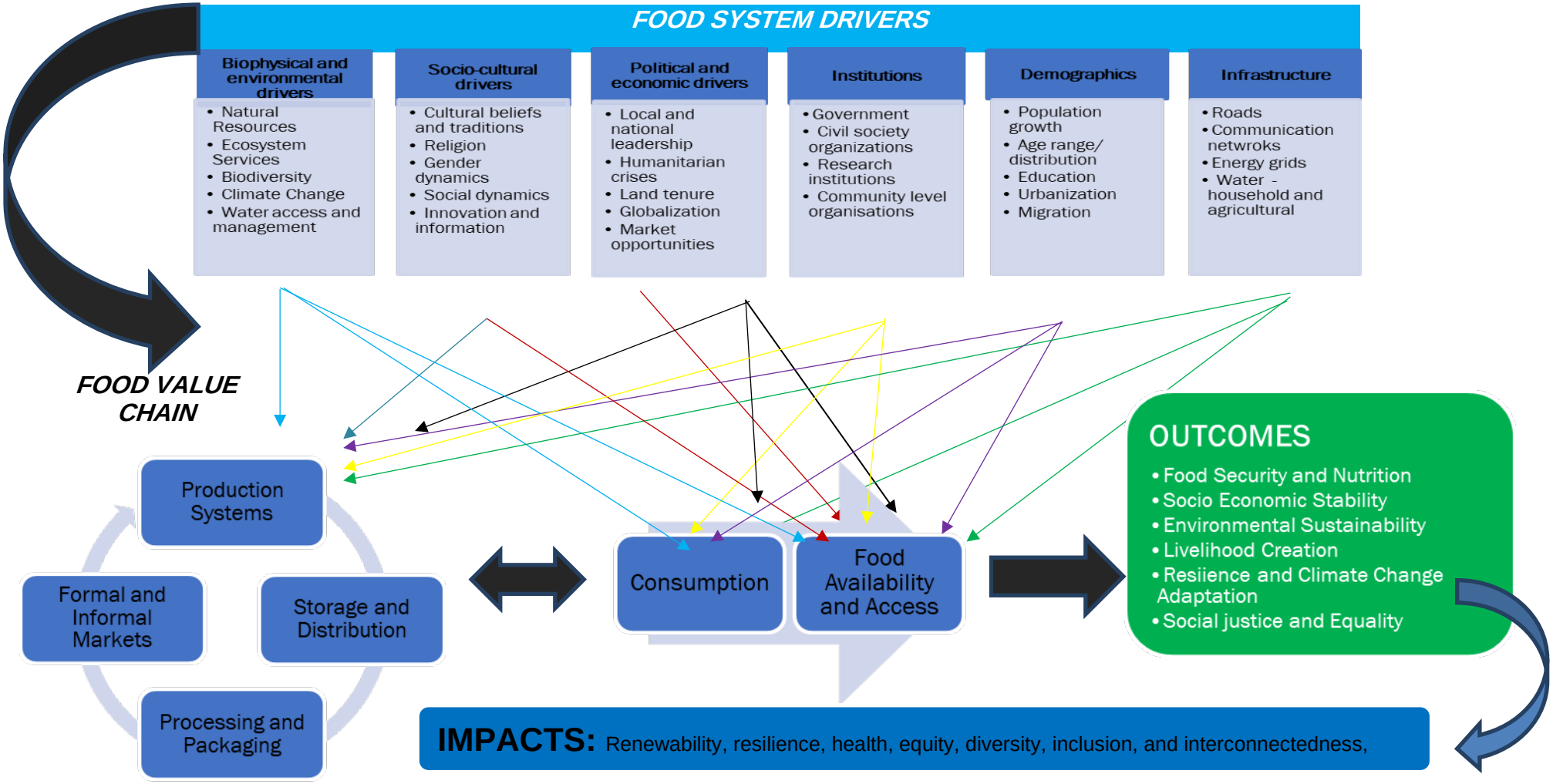


Figure 10: MDF Contextualised Food Systems Framework. (Adapted from the Sustainable Food Systems Network, TRANSMANGO D2.1 Framework and the Global Alliance Food Systems Framework)

The diagram below outlines the main food system stakeholders who have been involved in the food system analysis and transformation interventions led by MDF.

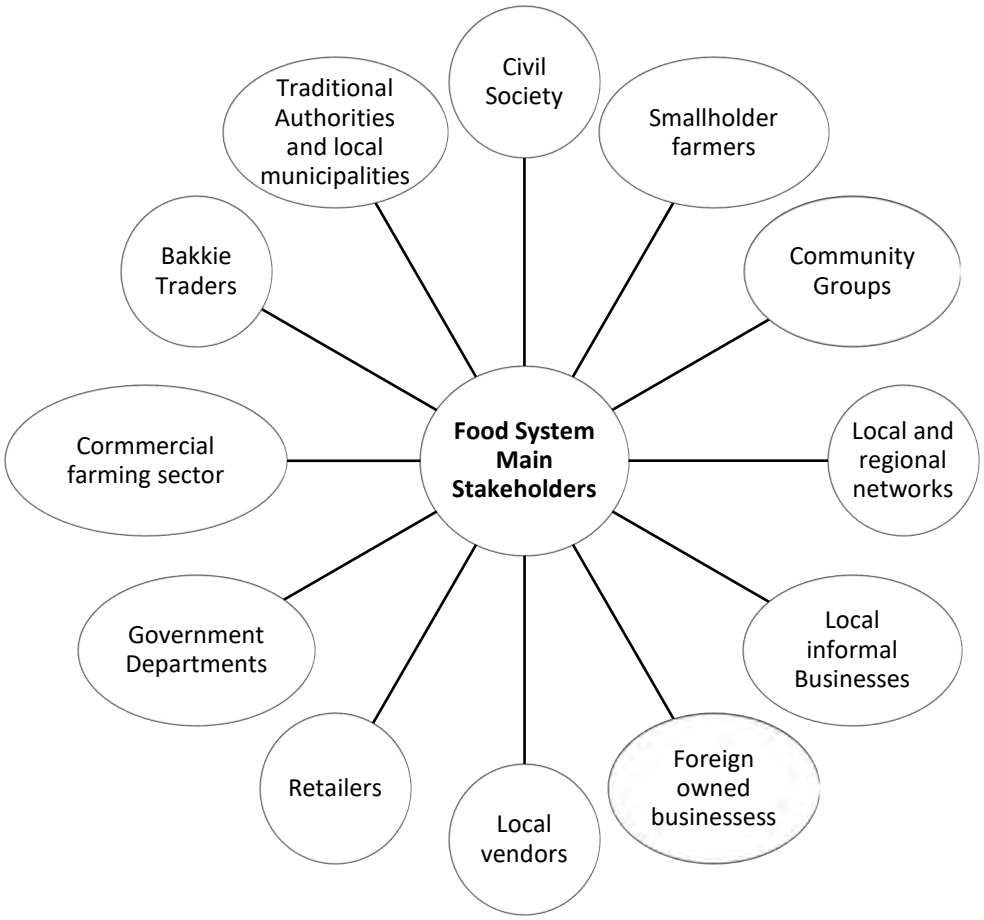


Figure 11: Main food system stakeholders.

These stakeholders have been engaged through a range of platforms at local, regional, and national levels, on both conceptual and practical implementation levels.

The three case studies explore different aspects of food systems for smallholder communities in South Africa.

6.1.2 Strengthening Local Food Systems in the Midlands of KwaZulu-Natal

This case study documents how smallholder farmers in Ozwathini and Swayimane, two rural communities in the KwaZulu-Natal Midlands, are rebuilding their local food systems under increasing climate stress, market exclusion, and economic hardship. Through the coordinated support of MDF and a network of government, research, and private-sector partners, farmers have begun to transform fragmented subsistence production into more resilient, diversified, and income-generating food systems.

Ozwathini is a communal-tenure area under Inkosi N. Mthuli, straddling the uMshwathi and Indwedwe municipalities. Farming is deeply embedded in everyday life, with households producing maize, beans, potatoes, amadumbe, sweet potatoes, vegetables, and sugarcane, alongside livestock such as cattle, goats, pigs, and poultry. The majority of organised farmers are women, between the ages of 40 and 80 years old..

Ecologically, Ozwathini is well endowed with deep, fertile soils and high rainfall, but climate change has begun to undermine this natural advantage. Intense rains, flooding, pests, and soil erosion have sharply reduced maize and bean yields. Vegetable production is increasingly risky, and farmers struggle to supply consistent quantities to the informal markets on which they depend—neighbours, bakkie traders, and local school feeding schemes.

Despite these challenges, Ozwathini has strong institutional support. Farmers are CRA learning groups, savings groups, a marketing group, and a calf-rearing group. These link farmers to a wide network of

institutions, including the Department of Agriculture and Rural Development (DARD), UKZN, Durban University of Technology, uMgibe Farming Organics, the uMshwathi Local Municipality, and MDF itself. This institutional web enables farmers to access training, markets, research, and small-scale finance.

Infrastructure also plays a key role. Ozwathini is located between Durban and Pietermaritzburg, with a tar road connecting communities to Tongaat. The nearby town of Bhamshela hosts supermarkets, foreign-owned shops, and street traders, providing farmers with a market outlet. A hospital and FET college in Appelsbosch generate foot traffic and economic activity that farmers tap into through street vending.

Swayimane, under Inkosi Gcumisa, presents a more fragile picture. Communities like Mayizekanye, Gobizembe, and Ndlaveleni depend heavily on farming for both food and income but face severe environmental stress. Although soils are deep and fertile, years of chemical use and ploughing have degraded soil structure. Alien invasive plants such as lantana and wattle choke water sources and pastures, reducing grazing and causing livestock losses.

Water is a critical constraint. While most homes have taps, these frequently run dry, forcing households to rely on JoJo tanks and municipal water trucks. Roads are poor, making the transport of produce difficult. Unemployment is extremely high, particularly among youth, and many families rely on grants, seasonal farm work, and small trading activities.

Yet Swayimane has become a centre of institutional innovation. MDF's CRA learning groups have introduced crop diversification, poultry, and improved farming practices. The Institute of Natural Resources (INR) rehabilitates springs and supports women's food security projects. The University of KwaZulu-Natal runs climate, water, and technology research under the Umngeni Resilience Programme. SA Canegrowers, Msinsi Farming, and Jaagbaan provide technical, conservation, and input support. Together, these institutions are building a platform for climate-smart, market-oriented smallholder farming.

MDF introduced **Conservation Agriculture (CA)** as a response to declining soil fertility, erosion, and rising input costs. CA rests on three principles: minimum soil disturbance, permanent soil cover, and crop diversification. While initially met with scepticism, farmers began to see improvements in soil structure, moisture retention, and reduced fertiliser costs.

The figure below illustrates typical CA systems used in the Midlands, showing beans, summer cover crops and maize intercropped with legumes. These systems protect soil while maintaining food production. However, the Midlands' extreme rainfall has led to outbreaks of black rot and stalk borer, reminding farmers that CA must be combined with other climate strategies.

Figure 12: Examples of CA cropping for smallholder farmers in the Midlands showing beans (L), summer cover crops (M), and maize and bean intercropping (R), undertaken by farmers in the CRA learning groups.

CRA extended this approach by integrating water conservation, soil fertility, livestock, and crop management. Farmers experimented with indigenous climate practices alongside scientific training. This blend of culture and innovation is evident in rituals such as sacrifices to Nomkhubulwane, which coexist with modern tunnels, irrigation, and pest control.

One of the most transformative interventions has been the introduction of **micro-tunnels**. These low-cost plastic tunnels protect crops from heavy rain, wind, and pests while allowing year-round vegetable production. |the figure below shows a typical tunnel in Mayizekanye, built over deep trenches filled with organic matter. Bucket-drip systems irrigate crops using grey water, dramatically reducing water use. More than forty tunnels have been installed across the Midlands.

Figure 13: Example of a micro tunnel for a smallholder farmer in Mayizekanye, Swayimane.

Tower gardens offer another innovation. These vertical gardens grow up to one hundred plants in a small space, using recycled household water and minimal fertiliser. They are particularly suited to women farmers managing small homestead plots.

Livestock integration has also expanded. MDF introduced Boschvelder chickens, a hardy dual-purpose breed that produces both meat and eggs. Over 3 000 broiler chicks were ordered in 2023 alone, reflecting farmers' enthusiasm for fast-return livestock enterprises.

One of the biggest barriers for Midlands' farmers has been market access. MDF facilitated a shift from fragmented farm-gate sales to a monthly multi-village market stall in Bhamshela. This stall aggregates produce, improves bargaining power, and allows farmers to sell diverse products at fair prices. The figure below shows farmers setting up their market stall with labelled, packaged potatoes, beans, eggs, and vegetables, alongside posters advertising prices through social media. Farmers have learned to plan production, predict demand, and coordinate logistics. For Ozwathini, three-day monthly markets now include storage facilities and social media sales to Pietermaritzburg buyers.

Figure 14: Above left: Participants setting up their monthly market stall. Note packaging for potatoes, beans, eggs, and vegetables being sold. Above right: An example of the monthly posters and price lists used to advertise this market, both locally and through social media.

This marketing system supports a wide range of commodities, as shown in the table below, which estimates average income potential per farmer.

Table 17: Average income per participant from CRA-supported commodities

Commodity	**Average monthly income per participant**	**Annual income potential**
Broilers	R1 024.50	R12 294.00
Layers (eggs)	R641.00	R7 692.00
Field crops: Maize Beans	 R209.41 R237.50	 R3 713.00 R2 850.00
Vegetables	R247.00	R2 964.00
	Average monthly value of food per participant	
All commodities: This is an estimate only (further corroborated in resilience snapshots)*	R700.00	R8 400.00
Commodity for a selection of participants only	**Average monthly income per participant**	**Annual income potential**
Green maize	R1 300.00	R15 600.00 (up to R24 000)
Stall-fed calves	R750.00	R9 000.00 (up to R50 000)
Total value of production (including all commodities but excluding the selection)	**R3 059.41**	**R36 712.92**

**NOTE 1: Rand value for food was calculated from the individual interview, which elucidated detailed information of the produce consumed at a household level in kgs for vegetables, field crops, and poultry. A Rand value of R5.00 was ascribed to each kg of produce as an estimate.*
NOTE 2: From the resilience snapshots undertaken, the value of R3 060.00 resonates well with actual incomes outlined by participants, which were between R750.00 and R3 650.00 on average across the sites.

Cross-visits, farmer days and workshops have become vital as well as networking platforms. Midlands's farmers have visited Bergville to observe CA trials, tunnels, and poultry systems. These exchanges build confidence, spread innovation, and strengthen social networks.

Through MDF's facilitation, farmers now share information, coordinate sales, and support each other during crises. If one farmer cannot attend the market, others sell on their behalf. This collective approach has become the backbone of the local food system.

The Midlands case study shows that local food systems can be rebuilt even under climate stress when farmers are supported with integrated interventions. Conservation agriculture, climate-resilient technologies, livestock integration, savings groups and cooperative marketing have enabled Ozwathini and Swayimane farmers to increase production, stabilise incomes and improve food security.

MDF's approach works because it connects production, finance, markets and learning rather than treating them as separate issues. By walking the journey with farmers, building trust, and allowing experimentation, MDF has helped transform smallholder agriculture into a more resilient, locally rooted, and economically meaningful system.

6.1.3 Resilience in Local Food Systems case study

The CRA programme implemented between 2020 and 2022 in KwaZulu-Natal and Matatiele in the Eastern Cape was designed to respond to one of the most urgent development challenges in rural South Africa: how to maintain food security and livelihoods in the face of climate instability, poverty, and exclusion from formal food systems. Supported by WWF and the Nedbank Green Trust, the programme worked with 378 smallholder farmers organised into CRA learning groups across eighteen villages. These farmers were not simply supported as individuals, but as part of a local food system that includes production, savings, marketing, water management, and community governance.

The programme aimed to achieve two interlinked outcomes. At household level, it sought to improve food and nutrition security while ensuring that farmers earned enough income to sustain their farming activities. At community level, it focused on strengthening social agency so that people could organise, manage natural resources, build safety nets, and lead their own local economic development. These goals were pursued

through practical, field-based learning in conservation agriculture, livestock integration, agroecological vegetable production and local marketing, supported by savings groups and joint governance structures.

Farmers in the CRA learning groups were encouraged to assess their own exposure to climate risks and decide which adaptive practices would best suit their conditions. This led to widespread adoption of intercropping, crop rotation, cover crops and minimum tillage, together with improved livestock feeding, poultry production, trench beds, tunnels, composting, rainwater harvesting and grey-water irrigation. These technical changes were reinforced by regular reflection and seasonal reviews that allowed farmers to compare results, refine practices, and learn from one another. Over time, learning groups evolved into social platforms for collective action, resulting in the formation of marketing committees, water committees, calf-rearing associations, and conservation teams in many villages.

As production intensified and diversified, households experienced measurable gains in food availability and income. Across all sites, the total value of production rose to about R3 060 per household per month, representing a 68% increase compared with pre-project levels. Farmers expanded the number of crops they grew by around ten on average and introduced roughly ten new climate-resilient practices into their farming systems. Despite these gains, most households still prioritised food for their families first, selling surplus only when available. This made flexible marketing channels, such as farm-gate sales and local market stalls, the most appropriate outlets.

Financial resilience was strengthened through the rapid expansion of Village Savings and Loan Associations (VSLAs). Membership grew to 510 participants, with six new groups and one bulk-loan association established. These savings groups mobilised over R1.1 million annually, with an average of R3 342 per participant. Farmers used their savings and loans to buy food, pay school fees, purchase farm inputs, and run small businesses, providing a crucial buffer against shocks in an unpredictable climate.

To assess whether these interventions truly improved resilience, the project applied a detailed “resilience snapshot” methodology, originally developed through WRC research. These snapshots measured changes in farm size, crop diversity, productivity, income, water efficiency, savings, food security, social participation, and farmer confidence. In KwaZulu-Natal, forty-five farmers were assessed across **Bergville, the Midlands, and Southern KZN,** producing the results shown in the table below.

Table 18: Climate resilience snapshots for forty-five participants in KwaZulu-Natal (November 2022)

Resilience indicators	**Average increase**			**Comment**
	Bergville (n=21)	**Midlands (n=15)**	**SKZN (n=9)**	
Increase in size of farming activities *(Cropping areas measured, no. of fruit trees, and no. of livestock assessed)*	Gardening: 93 m²–234 m² (253%)	Gardening: 1 217 m²–1 664 m² (36%)	Gardening: 25 m²–100 m² (400%)	The sizes of gardens have increased substantially in Bergville and Southern KZN, where many participants were not gardening before. In the Midlands, most participants already have reasonably sized gardens.
	Field cropping: 2 460 m²–6 175 m² (251%)	Field cropping: 5 163 m²–6 270 m² (21%)	Field cropping: 1 666 m²–1 044 m² (-62%)	Dryland cropping has increased substantially since the introduction of CA and includes fodder production and cover crops in Bergville. Field sizes range from 500–28 0000 m². Field cropping has, however, decreased in SKZN due to adverse weather conditions and economic pressures, and has increased only slightly in the Midlands, where fields are already well established and reasonably large.
	Fruit and other trees: 1–2	Fruit and other trees: -0	Fruit and other trees: -0	Some farmers bought a few more fruit trees. Around 40% of households do not have any trees in their yards.
	Livestock: Cattle: 173–117 (-33%)	Livestock: >22 chickens per participant (46%)	Livestock: >5 layers per participant (5%)	More poultry are kept (broilers and layers) for marketing. Most families' livestock have decreased substantially due to theft, recent floods, and household use.
Increased farming activities (*Count of gardening, cropping, livestock integration)*	2	2	2	Several participants have re-initiated certain farming activities: gardening and/or field cropping activities as well as poultry production (broilers/eggs).
Increased season (*continuity of farming activities*	Yes	Yes	Yes	For field cropping – autumn and winter options, and gardening throughout the year. This is a measure for improved continuity and production.

Resilience indicators	Average increase			Comment
	Bergville (n=21)	**Midlands (n=15)**	**SKZN (n=9)**	
throughout the year)				
Increased crop diversity (*Count of the number of crops and CRA practices for each farmer)*	Crops: 24 new crops ~ 7 per participant	Crops: 20 new crops ~ 9 per participant	Crops: 19 new crops ~ 6 per participant	*Number of new crops for the area, planted per farmer: C*rops include coriander, basil, fennel, rosemary, lettuce, red lettuce, mustard spinach, kale, carrots, beetroot, Chinese cabbage, spring onions, leeks, onions, cabbage, red cabbage, butternuts, sorghum, sunflower, Sun hemp, Lab-lab, Lespedeza, tall fescue, winter cover crops, turnips, beans and cowpeas.
	Practices: 24 new practices (Average 11 per participant)	Practices: 21 new practices (Average 10 per participant)	Practices: 15 new practices (Average 8 per participant)	*Number of CRA practices implemented per farmer:* These include mulching, trench beds, liquid manure, raised beds, mixed cropping, inter-cropping, crop rotation, tunnels, drip kits, eco-circles, greywater use and management, CA, cover crops, inclusion of legumes, pruning of fruit trees, picking up dropped fruit, pest and disease control, feeding livestock on crops and stover, cutting and baling, fodder supplementation, health and sanitation for poultry, brooding, JoJo tanks and RWH drums.
Increased productivity (*increased yield)*	Gardening: >73 kg /season/ farmer	Gardening: >410 kg /season/ farmer	Gardening: >17 kg /season/ farmer	*Increase in kgs of vegetables produced per season:* Based on the increase in yields, from tunnels and trench beds for a range of vegetables and herbs.
	Field cropping: >450 kg /season/ farmer	Field cropping: >888 kg /season/ farmer	Field cropping: >181 kg /season/ farmer	*Increase in kgs of field crops produced per season:* Relates to switching to CA and increase in field size for a range of field crops – maize, beans, and potatoes
	Livestock: >2/year/ farmer	Livestock: >15 chickens/ year/farmer	Livestock: >21 chickens/ year/farmer	*Increase in number of livestock:* For Bergville, the number relates to cattle; for Midlands, to both layers and broilers; and for SKZN, to layers.
Increased water use efficiency	6	7	5	*Access, RWH, water holding capacity, and irrigation efficiency are rated. Scale: 0=same or worse than before; 1=somewhat better than before; 2=much better than before.* The ratings indicate good improvements in RWH, water holding, and irrigation efficiency, and some improvement in access.4 criteria, each with a value of two, were assessed.
Increased income	R741/month/ farmer Range: R240– R2 000	R3 641 /month/ farmer Range: R800–R7 320	R1 021 /month/ farmer Range: R200– R1 500	*Increase in average monthly income (Rands):* This is primarily through local marketing and small businesses. Several participants have lost employment and grant incomes and have replaced these with farming. Around 10% of participants have not improved their income.
Increased household food provisioning	Vegetables: 18kg/week	Vegetables: 27kg/week	Vegetables: 6kg/week	*Food produced (overall kgs per week) and consumed in the household:* For both Bergville and the Midlands, these figures indicate food secure participants, while for Southern KZN, the self-produced food is 30% of that required for a household.
	Dryland crops (maize, legumes, sweet potatoes): 23 kg/week	Dryland crops (maize, legumes, sweet potatoes): 16 kg/week	Dryland crops (maize, legumes, sweet potatoes): 17 kg/week	
	Poultry: 2–3/ month	Poultry: 2–3/ month	Poultry: 2 kg eggs/month	
Increased food security	Average: 3 food types/2x/ week	Average: 5 food types/3x/ week	Average: 3 food types/2x/ week	*No. of food types/no. of times/week:* This is a measure of improved dietary diversity and indicates both improved access and changes in food habits. The largest diversity is found for the more peri-urban communities in the Midlands.
Increased livelihood diversity options	1	1	1	*Average increase in livelihood sources:* Social grants, remittances, farming incomes, small business income, and employment. Increase in no. of livelihood options used. Primarily from farming and small business income.
Increased savings	Average: R152/month/ farmer	Average: R354/month/ farmer	Average: R280/month/ farmer	*Average increase in savings (Rands):* Savings used for food, household, education, and production. In Bergville, the increase is within existing savings groups, and for Midlands and SKZN, new groups have been established.
Increased social agency (collaborative actions)	3	3	1	*Average number of local organisations farmers belong to:* Participants generally belong to church groups and stokvels. New group collaborations include learning groups, farmers' associations, village savings and loan associations, marketing committees, farmer centres, work teams, and local water committees.

Resilience indicators	Average increase			Comment
	Bergville (n=21)	**Midlands (n=15)**	**SKZN (n=9)**	
Increased informed decision-making	2	2	2	*Average number of sources of information:* Own experience, local facilitators, other farmers/community members, facilitators, extension officers, and radio.
Positive mindsets	3	3	3	*A qualitative rating of wellbeing for each participant:* SCALE: 0=less positive about the future; 1=the same; 2=more positive about the future; 3=much more positive**. More and much more positive about the future: Much improved household food security and food availability.**

This table shows dramatic increases in garden and field sizes in Bergville and Southern KZN, and more moderate increases in the Midlands, where farms were already larger. Crop diversity expanded by between 6 and 9 new crops per farmer, and farmers adopted between 8 and 11 new CRA practices each. Productivity rose sharply: Midlands' farmers, for example, produced over 410 kg more vegetables and 888 kg more field crops per season. Monthly incomes increased by R741 in Bergville, R3 641 in the Midlands, and R1 021 in Southern KZN. Savings rose in all sites, and participants became involved in more social organisations, improving their ability to make informed decisions and manage risks. In all three regions, farmers reported being much more positive about their futures.

These changes were not just numerical. In Bergville, for example, gardens and fields expanded dramatically, and farmers introduced herbs, leafy greens, and legumes alongside maize. Although cattle numbers declined due to theft and flooding, poultry production grew, and farmers were able to sell surplus at market stalls. In the Midlands, favourable climate and access to towns allowed farmers to benefit even more strongly, with many participating in calf-rearing schemes and achieving high vegetable yields. In Southern KZN, although progress was slower because of isolation and harsh conditions, farmers still achieved improved food security and incomes, and regained confidence in farming.

The practical meaning of these shifts can be seen in individual cases. Bongiwe Shezi from Mayizekanye, for example, replaced tractor ploughing and heavy chemical use with cover crops, mulching and crop rotation, improving soil fertility and reducing erosion. Her own assessment of her farm, summarised in Tables 3 and 4, shows how better soil management, water conservation and crop diversity translated into healthier crops and lower input costs. Similarly, Philani Ngcobo from Ozwathini evaluated the impact of his practices in Table 5, rating conservation agriculture, tunnels, mulching, and cover crops as delivering high benefits for soil, water, productivity, income, and climate adaptation.

In **Matatiele in the Eastern Cape,** the environment is much harsher, with cold winters, frost, hailstorms, and poor soils. Despite this, twenty-one farmers doubled their garden sizes and introduced more than thirty new crops, mainly vegetables and herbs that could be sold locally. Average vegetable production increased by 116 kg per season, incomes rose by about R1 031 per month, and savings grew by R322 per month. Although field cropping declined because of drought and soil constraints, household food security and diet diversity improved, and farmers became more confident and organised.

The story of Matankiso Rajoale from Rashule brings these numbers to life. Starting with only basic vegetables and severe water constraints, she adopted trench beds, tunnels and new varieties such as mustard spinach, green beans, and carrots. She now earns around R2 000 per month from her garden alone. By integrating livestock, she grew her herd to forty-one sheep and fifteen cattle, selling animals for up to R28 000 at auctions. Poultry, composting, and manure use further strengthened her system. Despite rising feed costs and market competition, she credits the learning groups and savings support for transforming her household's security and confidence.

Figure 15: Matankiso Rajoale from Rashule in Matatiele, standing in a bed planted to mustard spinach. In the foreground is a bed of peas.

Local marketing was another pillar of resilience. Farmers primarily sold surplus through farm-gate sales and monthly market stalls in Bergville and Ozwathini. Table 19 shows that between April 2021 and August 2022, these stalls generated almost R97 000, averaging about R6 900 per month. Farmers sold a wide range of vegetables, grains, meat, fruit, and processed foods, and even used social media to supply customers in Pietermaritzburg. Over time, they learned to plan production around market days, coordinate transport, and share selling responsibilities, strengthening trust and cooperation.

Table 19: Sales records for local market stalls in Bergville and Ozwathini; April 2021–August 2022

Summary of market incomes for Market stalls: April 2021–August 2022					
Date	**No farmers**	**Villages**	**Amount**	**Market**	**Produce**
2021/04/10	11	2	R2 419.00	Emmaus	**VEGETABLES**: Broccoli, cauliflower, cabbage, kale, Chinese cabbage, mustard spinach, leeks, onions, lettuce, carrots, beetroot, green peppers, chilies, brinjals, green maize, green beans, tomatoes. **HERBS:** Coriander, parsley, fennel. **FIELD CROPS:** Maize, dry beans, sweet potatoes, *amadumbe*, pumpkins, butternut. **FRUIT**: Bananas, avocado, naartjies, lemons. **MEAT:** Pork, broilers, chicken pieces, eggs. **PROCESSED FOOD**: Bottled chilies, mealie bread vetkoek **OTHER**: *incema*, seed potatoes, pinafores, grass brooms, mats, beads, artwork. Combo packs – via social media in Pietermaritzburg: Potatoes, carrots, eggs, chillies, onions, cabbage (half and chopped), green beans, beetroot, avocado, brinjals, green peppers, chopped mixed veg. **Average income per participant: R382 per market day (R100–R1 600)**
2021/05/09	16	3	R1 580.00	Emmaus	
2021/06/09	18	4	R5 072.00	Emmaus, Stulwane	
2021/07/10	16	4	R3 415.00	Emmaus, Stulwane	
2021/08/07	9	3	R2 379.00	Emmaus	
2021/09/09	18	4	R3 745.00	Emmaus	
2021/10/08	8	4	R845.00	Bergville market	
2021/06/04	16	4	R11 527.50	Bamshela – Ozwathini	
2021/08/04	8	4	R3 866.00	Bamshela – Ozwathini	
2021/09/03–07	12	5	R5 448.00	Bamshela – Ozwathini	
2021/10/05–06	12	5	R3 354.00	Bamshela – Ozwathini	
2021/11/03–04	9	4	R2 964.00	Bamshela – Ozwathini	
2021/10/11	3	2	R19 800.00	Sales to shops in Bergville: Boxer and Saverite	
2022/03/02	19	4	R1 310.00	UEDA – Emmaus Hall	
2021/12/02–03	10	4	R2 964.00	Bamshela – Ozwathini	
2021/12/03	10	4	R1 400.00	Ozwathini – social media	
2022/01/05–06	6	3	R2 610.00	Bamshela – Ozwathini	
2022/02/05;12;19	8	4	R3 010.00	Bamshela – Ozwathini	
2022/03/11	6	4	R1 216.00	Bamshela – Ozwathini	
2022/05/03–04	7	3	R2 565.00	Bamshela – Ozwathini	
2022/06/02–04	7	4	R4 782.00	Bamshela – Ozwathini	
2022/07/05	11	3	R2 500.00	Bergville town market stall	
2022/08/03	17	6	R4 823.00	Bergville town market stall with FSG farmers	
2022/08/04–06	7	3	R4 248.00	Bamshela – Ozwathini	
	11	**4**	**R96 626.50**	**INCOME: ~ R6 901 /month**	

Figure 16: Images of the latest markets in Bergville and Ozwathini, August 2022. Note the range of products, including dry beans as well as unusual vegetables such as Chinese cabbage, kale, and cauliflower.

Overall, the case study demonstrates that resilience in local food systems is not created by one intervention alone, but by the integration of sustainable farming practices, financial inclusion, collective marketing, and strong social organisation. Even in difficult environments such as Southern KZN and Matatiele, farmers were able to improve food security, incomes, and confidence when supported through learning groups, savings schemes, and adaptive farming. While broader market and input supply constraints remain beyond the reach of local initiatives, the programme shows that community-based climate-resilient agriculture can significantly strengthen livelihoods and rebuild hope in some of South Africa's most vulnerable rural areas.

6.1.4 Narrative Summary of CBCCA Case Studies Across Three Agro-Ecological Zones

The CbCCA programme implemented MDF represents one of the most systematic efforts in South Africa to measure, understand, and strengthen smallholder farmer resilience under accelerating climate stress. Across three contrasting agro-ecological zones (Mametja-Sekororo in Limpopo, Bergville in the Northern Drakensberg of KwaZulu-Natal, and Matatiele in the Eastern Cape). This work combined agroecology, water stewardship, livestock integration, financial systems, and community governance into a single adaptive framework. Between May and July 2024, MDF undertook a large-scale assessment using updated resilience tools that integrate ecological, social, and economic dimensions of adaptation.

A total of ninety individual farmer interviews and 271 focus group participants contributed to the evidence base across the three zones, as shown in Table 20.

Table 20: CbCCA interviews and focus groups in different agroecological zones.

Province/area	**Agroecological zone** (HarvestChoice; International Food Policy Research Institute (IFPRI), 2015)	**Villages**	**Number of individual Interviews**	**PIAs (focus group discussions)**
Limpopo, Mametja – Sekororo	Tropic – warm, semi-arid	Willows, Sedawa, Santeng, Worcester, Turkey	20	Willows (33) Sedawa (19)
Eastern Cape, Matatiele	Sup tropic, cool, semi-arid	Nchodu, Ned, Nkau, Rashule	17	Nchodu (18) Ned (22)
KwaZulu-Natal, Northern Drakensberg	Sup tropic, cool, Subhumid	Eqeleni, Ezibomvini, Stulwane, Vimbukhalo, Ezinyonyane	20	Eqeleni (13) Ezibomvini (15) Stulwane (35)

KwaZulu-Natal, Southern Region	Sub tropic cool subhumid	Mahhehle, Ngongonini, Centocow, Matirathal	20	Mahhehle (36) Centocow (32)
KwaZulu-Natal, Midlands	Sub tropic warm subhumid	Ozwathini, Mayizekanye	13	Ozwathini (22) Mayizekanye (26)
TOTALS		**20**	**90**	**271**

These assessments were guided by a revised theoretical framework that merges agro-ecosystem resilience theory (Cabell & Oelofse) with Oxfam's three resilience capacities: absorptive, adaptive, and transformative. MDF translated this theory into measurable indicators through an upgraded "resilience snapshot" tool that captures changes in farming, income, food security, water, knowledge, social organisation, and decision-making.

This framework, summarised in Table 21, shows that resilience is not just about yields or water use, but about the whole system's ability to absorb shocks, adjust to change, and transform structures of vulnerability.

Table 21: Expanded and modified set of resilience indicators for MDF's resilience snapshots

Indicator name and no.	Rationale	Definition	Unit of measure
Absorptive capacity			
1. Socially self-organised (Focus on support networks)			
1.1 Support networks/groups	Support networks build absorptive capacity by helping farmers to absorb and survive shocks.	Networks or groups that farmers use for emergency and psycho-social support	Average no. of groups, % of farmers belonging to different types of groups
1.2 Increased social agency (collaborative actions)	Absorptive capacity is enhanced by support networks that enable individual and collective agency to make farming activities more efficient and productive.	Extent of collaboration, e.g., market days, assistance with ploughing, labour, seed sharing, saving groups, etc.	Average no. of collaborative actions in which farmers are involved
2. Shared learning (Focus on learning for productivity)			
2.1 Increased knowledge sharing	Sharing of knowledge helps farmers to farm more effectively and to mitigate the impacts of shocks and disturbances. Also, the act of sharing knowledge promotes learning for the person doing the sharing as well as the recipient. Sharing shows that people have internalised information.	How knowledge is shared (e.g., informally with other farmers, in meetings with local orgs, meetings with external orgs such as DARD interest groups, in co-ops). What is shared: categories/ types of knowledge or sharing.	List of who shared with, list of types of knowledge shared
3. Ecologically self-regulated			
3.1 Increased water use efficiency Five-finger indicators Pest and disease management Pollinators	The five-finger principles promote ecological self-regulation through improved nutrient cycling, water use efficiency, soil health, maintenance of indigenous vegetation, and pollinator populations. Important for resilience, but MDF has not had any success with monitoring most of these. Most farmers are not aware of things like pollinators, pests, diseases, and soil health.	Whether the soil's water-holding capacity has improved (Y/N)	% Y vs. N responses
4. Honours legacy			
4.1 Traditional practices, crops, and livestock in use	Traditional practices are a way of maintaining memory of past conditions and experiences.	Which traditional practices are in use? (e.g. seed saving, heirloom/indigenous seeds or breeds, banana basins) – or changes to these.	List of traditional practices being used by farmers
5. Builds human capital			
5.1 Increased savings	Savings provide a buffer, allowing farmers to absorb and recover from shocks, and to plan and manage their cash flow.	Average increase in savings	Average increase in savings (Rands)
5.2 Use of savings for livelihoods improvement	If farmers are using savings for livelihood improvements rather than just on essentials such as food, it suggests that human capital is being built.	How savings are being used	List of options

Indicator name and no.	Rationale	Definition	Unit of measure
5.3 Increased knowledge and agency as a result of CRA	Building skills, knowledge and agency increase human capital, which enables farmers to farm more effectively.	What farmers can do now that they were not able to do before.	List of options
5.4 Increase in agricultural productive assets	Agricultural assets enable farmers to farm effectively and to absorb and recover from shocks.	Change in agricultural productive assets	List, count, and categorise (equipment, livestock, etc.)
6. Reasonably profitable			
6.1 Increased income	If farmers are able to make a livelihood through farming, they can remain in their communities and provide for their families, avoiding the social and psychological disruption of migration or circular migration.	Average monthly incomes, mostly though marketing of produce locally and through the organic marketing system.	Average monthly income (Rands)
6.2 Increased household food provisioning	If farmers are able to produce sufficient food locally, it reduces their dependency on store-bought food.	Food produced and consumed in the household	Overall food produced (kg per week)
6.3 Increased food security	Having a dependable supply of food and a good variety of foods is beneficial for health and wellbeing.	No. of food types and how often eaten. A recognised food security indicator.	No. of food types/no. of times per week
6.4 Increase in size of farming activities	An expansion of farming indicates that farmers have the resources and commitment to make this possible.	Size of farming activities (cropping, trees & livestock)	Cropping area (ha), no. of fruit trees and no of livestock.
6.5 Increased productivity	Apart from food security, increases in productivity create opportunities for participation in markets or value-added activities.	Increase in yields and/or livestock	Overall kg produced in a season, livestock increase/decrease
6.6 Increased savings	An increase in savings reflects successful livelihoods. Savings also allow farmers to invest in the future.	Average increase in savings	Average increase in savings (Rands)
6.7 Positive mindsets	This is an integrative measure of whether farmers feel they are "making it."	How positive farmers feel about the future	SCALE: 0=less positive about the future; 1=the same; 2=more positive; 3=much more positive.
Adaptive capacity			
1. Socially self-organised (Focus on learning networks)			
1.4 Learning networks/groups	Learning networks build adaptive capacity by promoting experimentation and evaluation of results.	Networks or groups to which farmers belong, which enable learning about CRA. (Will be just the MDF learning group in most cases).	Average no. of groups, % of farmers belonging to different types of groups
2. Shared learning (Focus on learning for adaptation)			
2.2 Use of information from past experimentation in decision-making	Successful adaptation is more likely when experimentation and learning inform farmers' decisions.	Whether information from past experimentation has been used	% of farmers using info from past experimentation
2.3 Prevalence of record-keeping	Record-keeping facilitates recall of past events/results and analysis of trends.	Whether farmers keep records of anything	Question Y/N
2.4 Most significant change in farming practices	Changed practices indicate learning	Most significant change in farming practices	List of practices
7. Diversity and redundancy			
7.1 Increased livelihood diversity options	Having a diversity of livelihood options increases farmers' response diversity (capacity to adapt to different shocks).	No. of livelihood options (sources of income), e.g., social grants, remittances, farming incomes, small business income, employment	Average no. of options per farmer
7.2 Increased diversity of farming activities	Having a diversity of farming activities also increases response diversity and provides for the spreading of risks.	No. of farming activities (gardens, field cropping, livestock, trees, etc.)	Average no. of activities per farmer
7.3 Increased crop diversity	Increased crop diversity increases functional and response diversity (different crops perform different roles, provide different nutritional benefits, and respond differently to stress, disease, and disturbance).	No. of crops planted by farmers which were not planted previously ("new" crops)	Average no. of "new" crops added, overall and per farmer

Indicator name and no.	Rationale	Definition	Unit of measure
7.4 Increased CRA practice diversity	Different practices have different functions within the agroecosystem (functional diversity).	No. of CRA practices used by farmers that were not used previously (e.g. mulching, trench beds, liquid manure, raised beds, mixed cropping, inter-cropping, crop rotation, tunnels, drip kits, eco-circles, greywater use and management, Conservation Agriculture, cover crops, inclusion of legumes, pruning of fruit trees, picking up dropped fruit, pest and disease control, feeding livestock on crops and stover, cutting and baling, fodder supplementation, health and sanitation for poultry, brooding, JoJo tanks, RWH drums)	Average no. of "new" practices added, overall and per farmer
7.5 No. of water sources	Redundancy in the water supply reduces the impact of the failure of one source.	List of water sources available to the farmer.	Average no. of water sources, overall and per farmer
7.6 No. of nutrient sources	Redundancy in nutrient supply	List of nutrient sources available to the farmer	Average no. of nutrient sources, overall and per farmer
7.7 No.of suppliers	Redundancy in the supply of inputs	No. of suppliers available to farmers for gardening, field cropping, and livestock needs	Average no. of suppliers available, overall and per farmer
7.8 No. of sales outlets	Redundancy in sales outlets	No. of sales outlets available to farmers for selling produce from gardening, field cropping, and livestock	Average no. of sales outlets available, overall and per farmer
8. Spatial and temporal heterogeneity			
8.1 Increased season	Seasonal variation of activities determines how farming benefits are distributed in time.	Has the seasonal extent of farming increased? (i.e., autumn and winter, and all-year options).	Question Y/N
8.2 Heterogeneity of land use	Spatial variation in land use influences landscape connectivity, which may influence the movement of fire, pests and diseases, pollinators, or water. It also provides response diversity because areas under different land use may respond differently to shocks.	Size and spatial connectivity of fields and natural vegetation.	?
8.3 Crop rotation/mixed cropping	Crop rotation and mixed cropping allow time for soil and vegetation to recover and increase temporal variation.	Whether farmers practice this and to what extent	Question Y/N with comments, maybe a degree
8.4 Livestock integration	Livestock and crop integration, such as through grazing management, rotational grazing, fodder production, buying fodder, or baling, allows for functional integration of spatially and temporally heterogeneous activities.	Which livestock integration practices are used?	List of practices used per farmer from the drop-down list
9. Appropriately connected			
9.1 Flexibility of networks	Flexibility of networks (many weak connections) allows configurations to change according to members' needs and desires.	Could be applied to networks of suppliers, marketing networks, governance networks, etc.	No, and the strength of connections between people
Transformative capacity			
1. Socially self-organised (Focus on networks for structural change)			
1.7 Inclusivity of networks/groups	Inclusive social and governance structures build transformative capacity by reducing marginalisation, exclusion, and inequity.	The extent to which farmer learning groups include women, youth, and marginalised individuals (e.g., disabled, minority languages)	Average % of group members who are women, youth or from marginalised groups
1.8 Extent to which networks cross scales or hierarchies	Connections across scales or hierarchies provide opportunities for advocacy and structural change.	No. of "active" connections between farmer learning groups and macro-level stakeholders (meaning that there has been interaction or exchange of information, etc., within the past year).	Average no. of active cross-scale connections
2. Shared learning (Focus on learning for transformation)			

Indicator name and no.	Rationale	Definition	Unit of measure
2.4 Changes in personal attitudes, motivations, or beliefs	Such changes reflect personal transformation, which is the foundation for and motivator of broader transformation.	Farmers' perceptions of how they think they have grown and how their personal attitudes have changed	Average no. of farmers reporting changes
10. Globally autonomous and locally interdependent			
10.1 External vs. local inputs	If farmers are highly dependent on external inputs, they will be at the mercy of external structures and circumstances (e.g., wars, politics, inflation, multi-national corporations) and will therefore have little ability to bring about structural change. If inputs are obtained locally, it suggests local interdependence.	No. of external inputs divided by no. of local inputs (e.g., seed, fertiliser, pest control products, feed, etc.)	Ratio of external to internal inputs

Mametja-Sekororo lies in one of South Africa's hottest and driest smallholder farming regions. Rainfall (≈550 mm) is far lower than evaporation (≈1200 mm), making dryland cropping increasingly impossible. Nearly 80% of residents depend on social grants, while climate change has intensified drought, crop failures, livestock losses, and social strain. Through MDF and partners such as AWARD, communities shifted decisively toward intensive homestead food production, water harvesting, and soil restoration rather than large-scale field cropping. Table 22 summarises how farmers' absorptive and adaptive capacities changed.

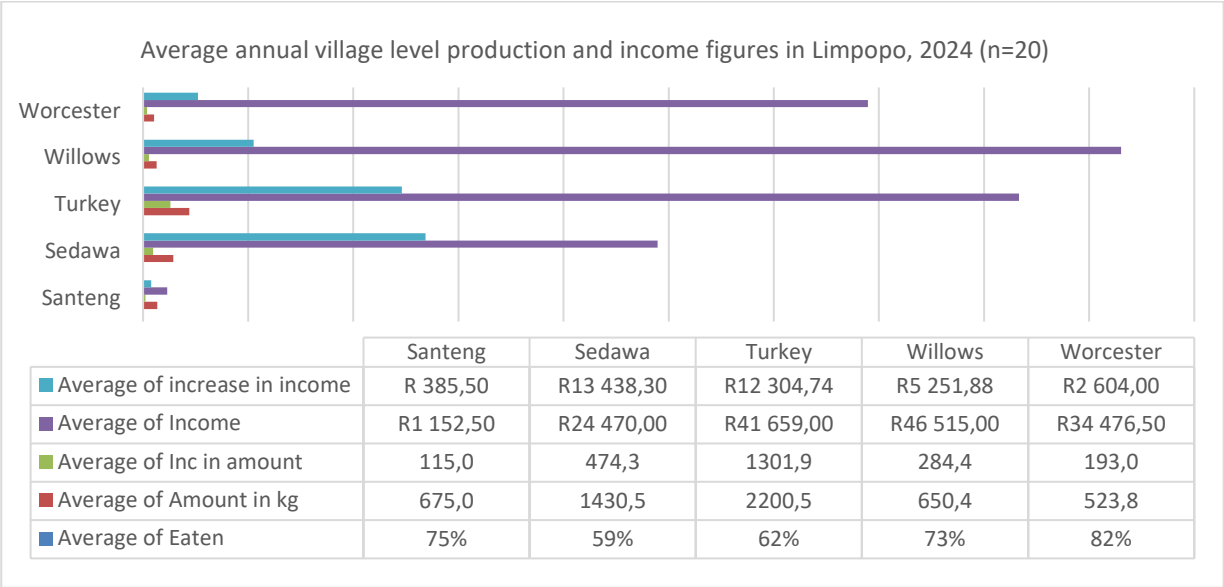
Table 22: Adaptive and absorptive capacities analysed for Limpopo, 2024

Absorptive capacity			
Socially self-organised	Collaborative actions/social agency	Change in no. of groups (average); e.g., learning groups, savings groups, water committee, livestock association, policing forums	2
Shared learning	Increased knowledge sharing	Change in types of knowledge shared (average); e.g., written information, learning groups, local facilitators, other farmers	2
Ecologically self-regulated	Water use efficiency	Change in no. of practices for improved water holding (average); e.g., trench beds, tunnels, tower gardens, mulching, small dams, mandala beds, JoJo tanks	4
		Change in no. of practices for reduced run-off (average); e.g., diversion ditches, furrows and ridges, banana basins, stone bunds	2
	Improved soil health	Improved soil structure (% of respondents)	80%
		Improved organic matter	50%
		Fewer pests and diseases	90%
		Better able to deal with drought	50%
Honours legacy	Traditional practices	No. of practices in use (average); e.g. timing and planting of Bambara groundnuts, seed saving, traditional seed storage techniques	1
Reasonably profitable	Increased livelihood options	Average change in no. of options, e.g. farming, small business, part-time employment	1
	Increased income	Average monthly income change (ZAR)	R1 222.22
	Increased food security	Average no. of food types consumed weekly. Five food types eaten 1–3 times per week – shows good nutritional diversity for rural communities	5
	Increased productivity	Average change in no. of crops (garden and field); including spring onions, kale, brinjal, green pepper, beetroot, carrots, sun hemp, Dolichos, sorghum, lucerne, mustard spinach, coriander, parsley, broccoli, lettuce	11
		Change in no. of fruit trees; including lichi, mango (Tommy, Kiet), avocado, macadamia	3
	Increased savings	Change in monthly savings (ZAR)	R462.50
	Positive mindsets	Scale (0 to 2): 0=same or worse, 1=somewhat improved, 2=much improved	2
Adaptive capacity			
Increased diversity in farming	Farming activities (gardening, field cropping, livestock, fruit trees)	Average change in no. of farming activities; mostly due to now doing gardening activities that were not undertaken before, and fruit production. A few participants have included small livestock in the form of poultry.	2

Increased CRA practice diversity	Adoption of new practices	Average change in no. of CRA practices, including tunnels, trench beds, shallow trenches, eco-circles, tower gardens, drip irrigation, mulching, liquid manure, underground rainwater harvesting, small dams, crop rotation, mixed cropping, CA, furrows and ridge, banana basins, seed saving, and propagation from seed.	8
Increased water sources	Names of sources	Average change in no. of water sources. New group-based local schemes with boreholes, rainwater harvesting, but mostly no new water sources for access.	1
Redundancy in nutrients, input suppliers	Names of inputs	Average no. of inputs/supplier types; including VKB, Obaro, Alzu, Parma, Provet.	4
	Names of nutrients	Average no. of nutrient types, e.g., kraal manure, compost, mulching, liquid manure.	1
	Names of suppliers	Average no. of sales outlets, including local (farm gate), market stalls in Hoedspruit, Meat Naturally Auctions, and Makhona supermarket.	1
Spatial and temporal heterogeneity	Increased growing season	Gardening (% of respondents)	100%
		Field cropping (% of respondents)	0%
		Livestock and/or fruit (% of respondents)	40%
	Mixed cropping	Now practising (% of respondents)	100%
	Crop rotation	Now practising (% of respondents)	90%
	Livestock integration practices	Grazing management, restoration, firebreaks, fodder production, etc.	0%

Farmers adopted an average of eight new CRA practices, including trench beds, mulching, tunnels, composting, rainwater harvesting, and eco-circles. Mulching, tunnels, mixed cropping, and crop rotation were the most widely adopted practices.

A participatory ranking exercise in Sedawa village revealed that farmers judged mulching, kraal manure, compost, stone bunds, and tunnels as the most effective practices across water, soil, labour, and crop quality. Figure 14 demonstrated that villages with improved water access (Sedawa and Turkey) produced significantly more food and income, with annual farm incomes reaching R44 000, while water-scarce villages like Santeng remained stuck at around R1 100 per year.



	Santeng	Sedawa	Turkey	Willows	Worcester
Average of increase in income	R 385,50	R13 438,30	R12 304,74	R5 251,88	R2 604,00
Average of Income	R1 152,50	R24 470,00	R41 659,00	R46 515,00	R34 476,50
Average of Inc in amount	115,0	474,3	1301,9	284,4	193,0
Average of Amount in kg	675,0	1430,5	2200,5	650,4	523,8
Average of Eaten	75%	59%	62%	73%	82%

Figure 17: Average production and income figures for farmers participating in CRA in Limpopo for 2023–2024

Overall, Limpopo farmers increased average annual income by R8 440, bringing total farm income to around R36 600 per household, a significant buffer against climate and economic shocks.

Bergville lies in the Northern Drakensberg, where rainfall is higher but increasingly erratic, with rising storms, hail, erosion, and alien plant invasion. Poverty and unemployment remain severe, with most households relying on grants. Here, MDF's long-term investment in conservation agriculture, livestock systems, water committees, and rangeland management produced a deeper form of resilience. Table 15

shows that communities developed dense organisational networks, including livestock associations, water committees, grazing groups, savings groups, and CRA learning groups.

Table 23 captures how villagers responded to climate impacts. For declining rainfall and water access, they used spring protection, greywater, tunnels, and mulching. For grazing loss, they adopted firebreaks, fodder crops, and rotational grazing. For erosion and floods, they built stone packs, brush barriers, and diversion furrows.

Table 23: Climate change impacts, strategies and actions undertaken, and thoughts of the Bergville community, June 2024.

Natural			
CC Impact	**Solutions tried**	**Facilitated by MDF (*)**	**Further possible solutions (*when assisted by MDF)**
↓Rain	Clearing alien trees and greywater use Avoiding veld fires Trench beds and drip irrigation Micro-tunnels and mixed cropping Mulching, no-till, cover crops. Rainwater harvesting	* * * * * *	None
↓Access to water	Locally led water access – spring protection, pipes, taps	*	None
↓Grazing lands (grasses)	Prevent veld fires. Make fire belts/breaks		Rotational grazing * Herding of livestock and fencing of fields and gardens to avoid conflicts when livestock eat neighbours' crops
↑Heat	Cover crops and tunnels	*	Reduce burning of veld and waste to reduce emissions.* Promote recycling
↑Floods	None		Erosion control* Drainage for roads, repair of bridges*
↑Soil Erosion	Herding livestock and interchanging grazing points Stone and brush packing	* *	
↑Winds	*Ukuteta ikhomani* (traditional method where a woman puts a calabash on her back like a baby, which is believed to calm heavy winds)		Planting of trees and fruit for wind protection
↑Alien vegetation	Alien clearing	*	
↑Hailstorms	*Ukuzila inhlabathi* (traditional method of stopping cultivation of the soil for that particular period)		
↓**H**ouses	Water channelling using gutters and V-drains. Cutting grass around the houses to prevent it from catching fire during windy seasons	* *	Building stronger houses (using cement/concrete) Diversion furrows
↓Roads and bridges	Stone packs Diversion furrows Cleaning blockages in stormwater pipes	* *	Digging furrows for water drainage next to roads
↑**C**ar accidents	Speed humps		Reducing speed
↑Falling of trees (along the road/next to houses)	None		Cut damaged trees near roads
↑**D**iseases and increased mortality	-*Ukuchatha* (traditional stomach cleansing practise Traditional herbs and medications		Eating healthy foods – more organic and traditional food * Regular clinic check-ups
↑Hunger/Poverty	CRA: CA, livestock integration, intensive homestead gardening, poultry (broilers, layers, Boschvelders)	*	Workshops to learn about financial management. Diversification of enterprises
↑Crime	-Not buying stolen goods -Selling livestock		Spreading awareness of the consequences of crime to children
↑Drug abuse	None		Educating children about the consequences of drug abuse
↑Divorces	None		
Farming inputs (need more as fertilizers get washed away by rain)	Microdosing of fertilizer	*	
↑Prices	Farm a larger area with a diversity of crops	*	
↑Infrastructure costs (rebuilding costs)	Apply for government assistance		

Natural			
CC Impact	**Solutions tried**	**Facilitated by MDF (*)**	**Further possible solutions (*when assisted by MDF)**
↓Jobs	Farming for selling	*	Venture into other business enterprises

Importantly, these actions were not isolated: they were organised through water committees, learning groups, and grazing committees, forming a web of local governance. Participation data from Stulwane showed strong engagement, especially by women, in poultry, savings, water, and farming groups. Farmers reported that through MDF, they had learned to:

- Produce fodder and protein blocks
- Protect water sources
- Raise poultry as businesses
- Market produce, and
- Maintain soil through cover crops and no-till farming.

Although government support was weak and irregular, the social and ecological systems created through CbCCA allowed households to remain productive even as neighbouring villages abandoned farming.

Matatiele in the Eastern Cape faces cold winters, frost, hail, and declining rainfall. As in other areas, 70–80% of households depend on grants, and land degradation and water scarcity are severe. Using MDF's new dashboard system, snapshot interviews showed that 71% of participants were women, and most were aged 35–65, meaning that farming is now being driven by working-age unemployed people rather than pensioners.

Figure 18: Gender and age distribution for resilience snapshot respondents in Matatiele, June 2024

Dashboards revealed major improvements in social organisation and knowledge sharing, with farmers doubling their information sources from three to six, increasingly using WhatsApp, written material, and farmer networks.

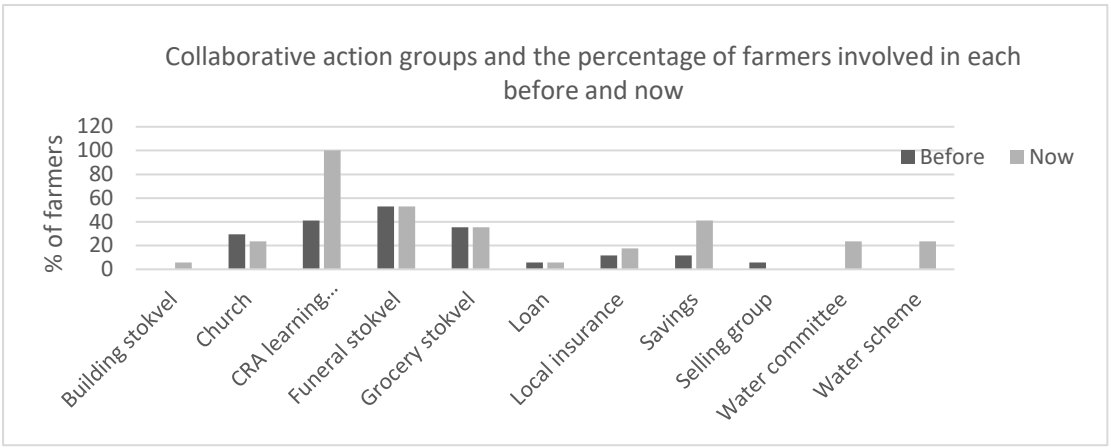


Figure 19: The different groups farmers belong to.

Ecological self-regulation improved significantly. One of the figures that clearly demonstrates this is the graph outlining efficient water-use practices that farmers started using during and after the CbCCA programme. These are shown in Figure 20 below and can be summarised as follows:

- 88% of farmers used mulching
- 53% of farmers have trench beds
- 47% of farmers use rainwater harvesting and
- 24% of farmers have JoJo tanks and tunnels.

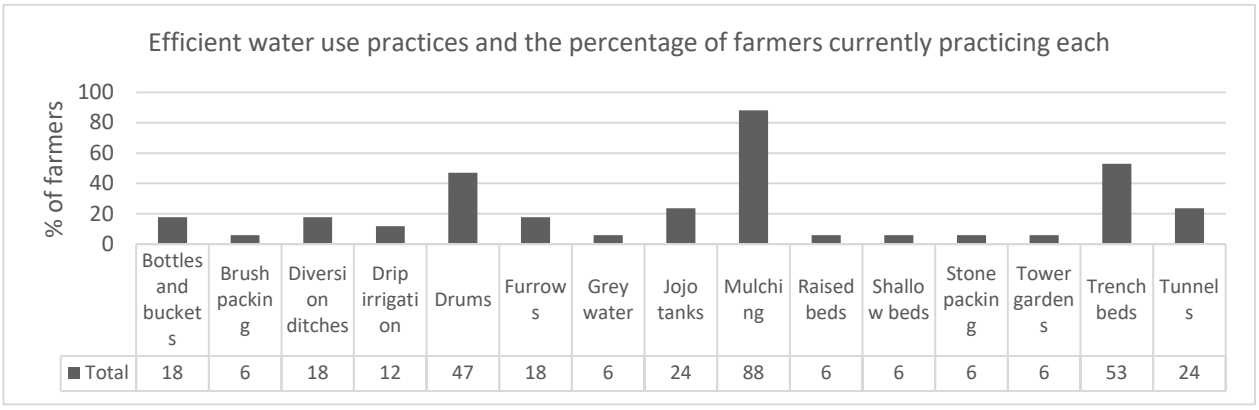


Figure 20: Percentage of farmers using different water use efficiency practices.

A further figure related to ecological self-regulation showed that:

- 75% of farmers saw fewer pests and diseases
- 53% of farmers had more organic matter,
- 47% of farmers saw better soil structure and
- 35% of farmers saw better drought tolerance.
-

Farming became more diverse and more continuous throughout the year, with 94% of farmers increasing their gardening season and 59% of farmers extending livestock production. Income sources shifted dramatically. Whereas only 29% of participants relied on farming as a livelihood strategy before the CbCCA programme, 76% relied on farming during and after the programme, indicating that CRA has made farming a viable livelihood again.

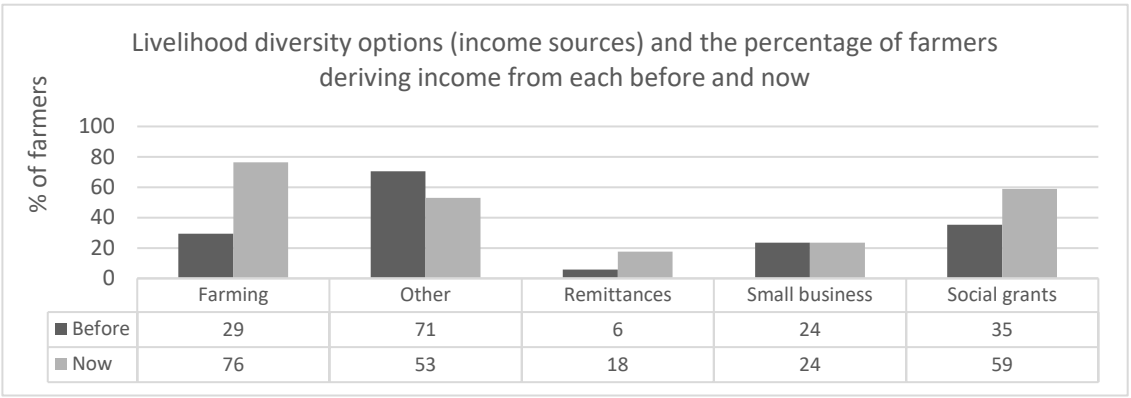


Figure 21: Percentage of farmers who use different livelihood options.

The data also showed broad adoption of CRA practices, with trench beds, composting, mulching, tunnels, and poultry being the most common.

Across all three agro-ecological zones, the CBCCA approach consistently strengthened:

- **Absorptive capacity** (through savings, food production, and water security)
- **Adaptive capacity** (through diversification, learning, and new practices) and
- **Transformative capacity** (through new institutions, networks, and decision-making power).

On average, participating households increased their incomes by about R16 000 per year while also securing their own food—at a time when non-participating households lost about 40% of income after COVID-19. These changes were not only technical but social and political: farmers organised themselves into water committees, grazing associations, marketing groups, and savings schemes, allowing them to collectively manage risk, resources, and markets.

The CBCCA case studies, therefore, provide strong empirical evidence that community-based agroecological systems, combined with finance, water stewardship, and social organisation, can reverse rural decline and build climate resilience at scale in South Africa's most vulnerable landscapes.

6.2 TABLE OF CONTENTS: CBCCA AND LOCAL FOOD SYSTEMS HANDBOOK

CHAPTER 7: CLIMATE RESILIENCE IMPACT MEASUREMENT FOR RURAL COMMUNITIES: A MERL MANUAL FOR COMMUNITY-BASED CLIMATE CHANGE ADAPTATION (CBCCA)

This manual outlines the MERL framework, methodology, and climate resilience impact measurement tool that has been developed for this research process.

7.1 SUMMARY

The Global Commission on Adaptation was launched in The Hague in 2018 by the United Nations and the leaders of twenty-two other convening countries, including South Africa. The Global Centre on Adaptation has developed an impact measurement framework, with the primary aim of monitoring cooperative adaptation action of non-state actors and fostering community collaboration and knowledge exchange (Global Commission on Adaptation, 2019).

The framework is underpinned by four core concepts to develop climate resilience metrics and functional characteristics of those metrics, which reflect the need for:

1. A **context-specific approach** to climate resilience metrics
2. Compatibility with **the variable and often long timescales** associated with climate change impacts and building climate resilience
3. An explicit understanding of the **inherent uncertainties** associated with future climate conditions, and
4. The ability to cope with the challenges associated with **determining the boundaries** of the climate resilience project.

These metrics can serve as a way of documenting climate resilience efforts more systematically and identifying successful examples. In doing so, they can also identify opportunities for further climate resilience support (Inter-American Development Bank, 2019).The transformation of food systems is crucial in the enhancement of food security, livelihood creation, environmental sustainability, and economic transformation. In these unprecedented times, a holistic approach is vital in driving systematic shifts in both global and local food systems (United Nations Environment Programme (UNEP), 2016).

MDF and our partners started by developing our systems approach and boundaries. MDF has done extensive work in strengthening local food systems in KwaZulu-Natal, Eastern Cape, and Limpopo. The organisation's project focus has been to reduce vulnerability and increase resilience to external shocks such as climate change, economic decline, food insecurity, and political instability, which are particularly detrimental to the poorest of the poor. Further complicating matters is the reality that smallholder farmers do not have access to formal credit, are excluded from the mainstream economy, struggle with high levels of unemployment, and are food insecure. The disproportionate distribution of power between men and women also continues to be a point of major concern, although the tide is slowly turning. There is, therefore, a necessity for interventions that will drastically reduce and eradicate the challenges. Our project activities have included the introduction of sustainable agricultural practices, which encompass agroecology and regenerative agriculture principles, to help strengthen the farming systems of smallholder farmers, alongside local marketing, and microfinance and microlending options. More recently, an increased focus on soil and water conservation, as well as resource conservation and management, has also been included in the suite of interventions.

In efforts to better understand local food systems as well as their challenges and opportunities, MDF has applied the food systems approach, in which a framework was outlined to identify the primary external drivers, the interactions between the various components of the food system, as well as the actors involved, the outcomes, and the impacts. This food system framework is adapted from three similar frameworks developed by the Sustainable Food Systems Transformative Network, the Global Alliance Network, and the TRANSMANGO Network, and is presented in Figure 10, in the sections above.

Linked to this, a methodology for assessing changes (positive or negative) for a suite of bespoke resilience indicators was developed. This process was initially piloted in a WRC-supported research process entitled "*Climate change adaptation for smallholder farmers in South Africa: A decision support guide* "(WRC report no: IT/841/1/20) (Kruger, 2021). An integral component of the methodology is the resilience snapshots- an in-depth individual analysis of changes in their food system related to climate resilience. These snapshots are

designed to provide a time-based analysis of changes in resilience and a process to compare the resilience impact of interventions across different areas and agroecological zones.

The first step in strengthening MDF's tools for assessing smallholder farmer resilience was to strengthen the underlying theoretical framework. This was done by combining Cabell and Oelofse's indicators of agroecosystem resilience (Cabell & and Oelofse, 2012) with the concept of absorptive, adaptive, and transformative resilience capacities as used by Oxfam and others (Jeans, Castillo, & and Thomas, 2017)), to produce the theoretical framework.

Absorptive capacity ensures stability by preventing or limiting the negative impact of shocks. It is the capacity to 'bounce back' after a shock, through anticipating, planning, coping with, and recovering from specific shocks and short-term stresses. **Adaptive capacity** is the ability to make intentional, incremental adjustments in anticipation of or in response to change, in ways that create greater flexibility in the future. **Transformative capacity** is the capacity to intentionally change the deep structures that cause or increase vulnerability and risk, as well as how risk is shared within societies and the global community.

For the purpose of creating a coherent theoretical framework for resilience in this context, the different aspects of agroecosystem resilience described by Cabell and Oelofse (2012) were mapped onto the three types of resilience capacity as shown in Figure 22, to produce a guiding framework for monitoring and evaluating resilience. This framework includes the different aspects of resilience as well as the interplay between stability and change.

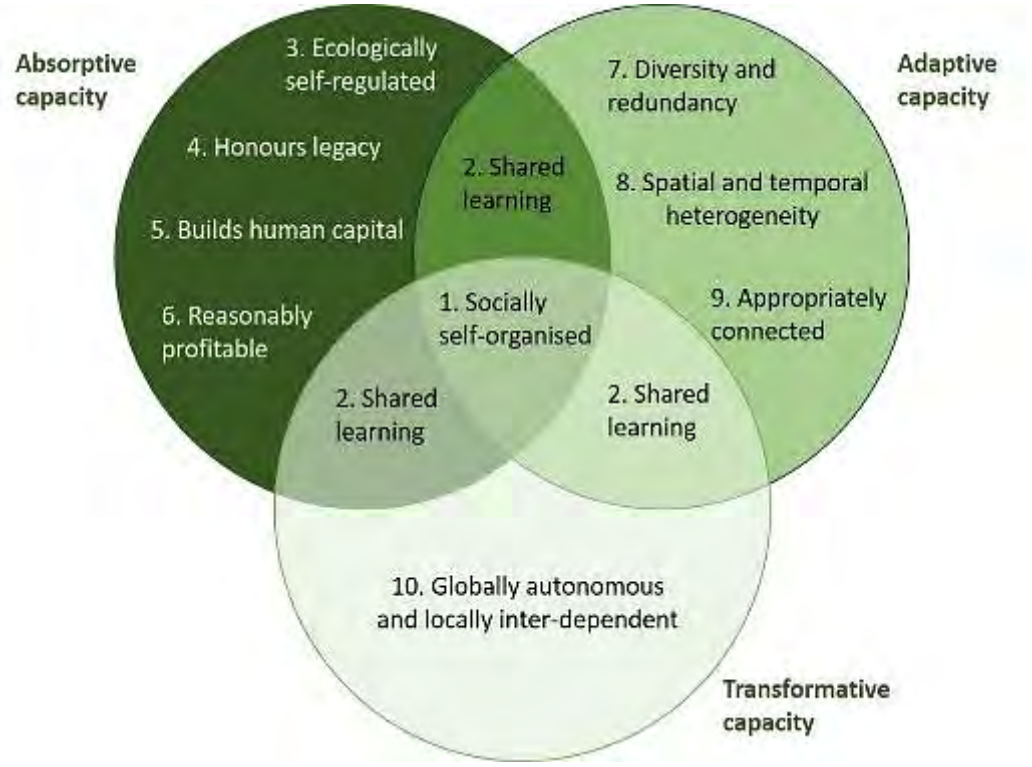


Figure 22: Theoretical framework for assessing resilience of smallholder farmers. Based on Cabell & Oelofse (2012) and Jeans et al. (2017).

The thirteen aspects of agroecosystem resilience described by Cabell and Oelofse (2012) were reduced to ten, and the resultant framework with specific, measurable indicators was developed for all the aspects of resilience and resilience capacity, starting from the existing indicators in MDF's Resilience Snapshot. Table 21 in the section above outlines these indicators.

The two aspects of resilience shown in the intersections between the three circles in Figure 22, namely **social self-organisation and shared learning**, are important for all three types of resilience capacity and at all three levels, although they are expressed in slightly different ways in each. For example, at the micro-level, farmer self-organisation is measured by the number of local groups that provide support, the inclusivity of groups, and the extent of collaborative actions among farmers. At the macro-level, similar indicators for social self-

organisation are used, which are applied at the regional or national level (e.g., collaborative actions would not be between individual farmers but between organisations or groups). Additional indicators may also be included at higher levels, such as whether all stakeholder groups are adequately represented.

7.1.1 Monitoring and evaluation, reflection, and learning (MERL) tools developed.

The **resilience snapshot** was improved and updated to incorporate the methodological considerations in the section above. These questionnaires are called snapshots as they can be administered at any time in the individual's progression towards resilience. They are not project-specific and are not meant to assess project outcomes, but rather to highlight changes the participant has made to adapt to climate change and to assess the improved resilience from such changes. It could be useful to do these snapshots repeatedly over time to get an indication of ongoing improvement or progression for the participant.

In addition to the individual interviews, there are aspects of resilience, notably social organisation, and changes in human capacity and learning related to climate change that are better analysed in groups, as these aspects are more relational in nature and rely on people's understanding, thinking, and opinions. For these aspects, a **participatory impact assessment** process was developed.

A third tool has been developed to explore in some depth the **impact of the VSLAs** on a selected number of individuals' income-generation and business expansion activities.

A database and data visualisation tool has been developed in Excel for the analysis and presentation of results. This has been designed to be available for other organisations and projects to use as well.

7.1.2 Tackling resilience snapshots and data visualisation

The resilience snapshot system used by MDF is designed to track how individual farmers change over time as they engage with climate-resilient agriculture. Rather than simply measuring conditions at a single moment, the snapshots focus on **movement along a resilience journey**, comparing where a person was before an intervention to where they are now. This makes it possible to understand both project-level impact and the long-term development of individual farmers across multiple projects and years.

To anchor this process, MDF begins with a **baseline** that captures each participant's vulnerabilities, resources, farming activities, and exposure to climate risks. This is done through a combination of a short individual questionnaire, focus-group discussions on climate impacts and adaptation strategies, and community "walkabouts" that allow facilitators to see farming and water systems in context. The approach deliberately avoids long and intrusive surveys at the start of projects, recognising that people's participation changes over time and that early data collection must remain practical and respectful. Instead, the baseline is designed so that the same questions can later be revisited to track change meaningfully.

Resilience snapshots are then used at different points in time: during or at the end of a farming season, annually for selected farmers, or across several years to compare performance under different climate conditions. To maintain comparability, all interviews in each round must be conducted within a short time window. At least 15% of participants in a village are sampled, or a minimum of 20–24 people, where groups are small. Sampling is structured to ensure representation across gender, age, vulnerability, and level of farming activity.

Once interviews are completed, the data are entered into an Excel-based database that feeds directly into an online dashboard system. Each farmer's answers are recorded in a main data table, which then automatically generates pivot tables and visualisations for the **landing page** (Figure 23) for the **absorptive and adaptive resilience dashboards** (Figure 24). This system allows users to view results for all regions together or to zoom in on specific provinces and villages.

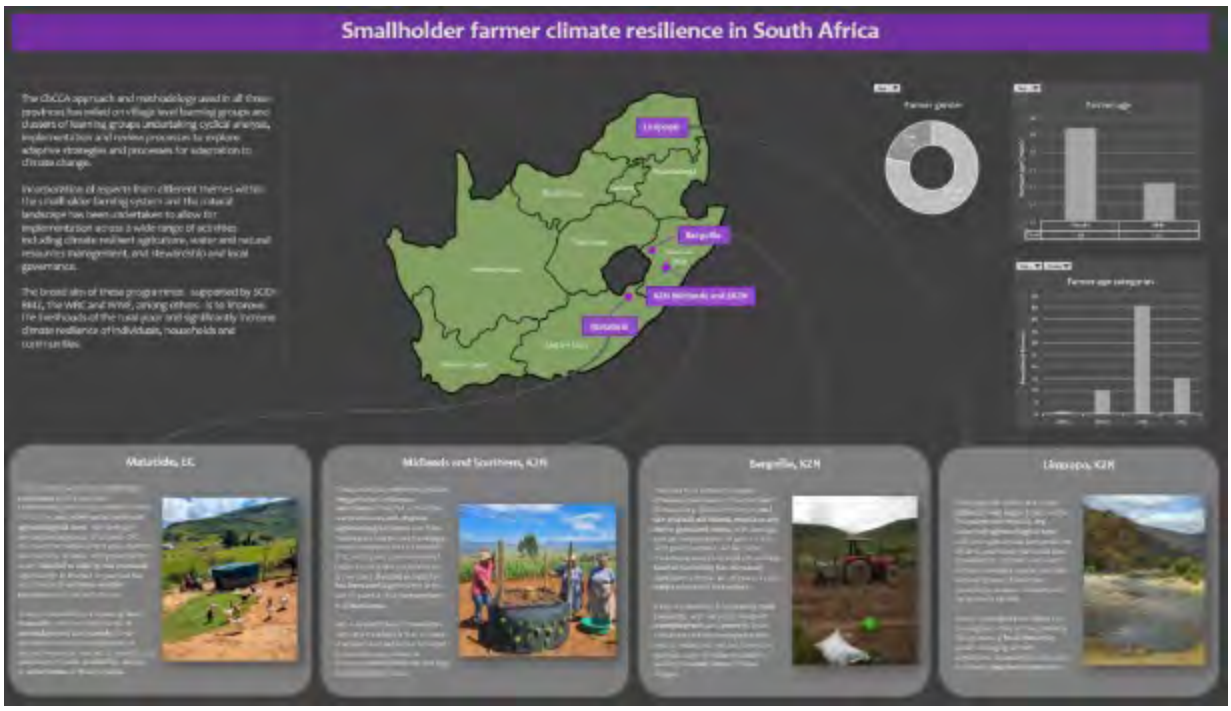


Figure 23: Landing page for the climate resilience dashboard.

Figure 24: The absorptive and adaptive dashboards.

An Excel-based workbook and dashboard have been developed for entering the information from the individual interviews to provide a clear and visual report. This database can be accessed on the MDF website

(https://www.mahlathini.org/our-work/water-research-commission-climate-change-adaptation-for-smallholder-farmers-in-s/final-resilience-dashboards/).
In this database, all individual interviews are transcribed into the MAIN DATA TABLE. Care needs to be taken to use the correct text or numbers for each cell. Interviews already loaded on this page can be used as examples.

Pivot tables for the **landing page** and **absorptive** and **adaptive** indicator sets are automatically created. This will then update the Landing Page and absorptive and adaptive dashboards to include the new information. On these dashboards, it is possible to drop down lists to look at information that is region- and village-specific, if that is required.

The figures below provide an example of demographic data that is available on the **landing page**.
The split of participants into different age categories can be viewed for all regions, per region, and also per male and female participants per region, as shown in Figure 25.

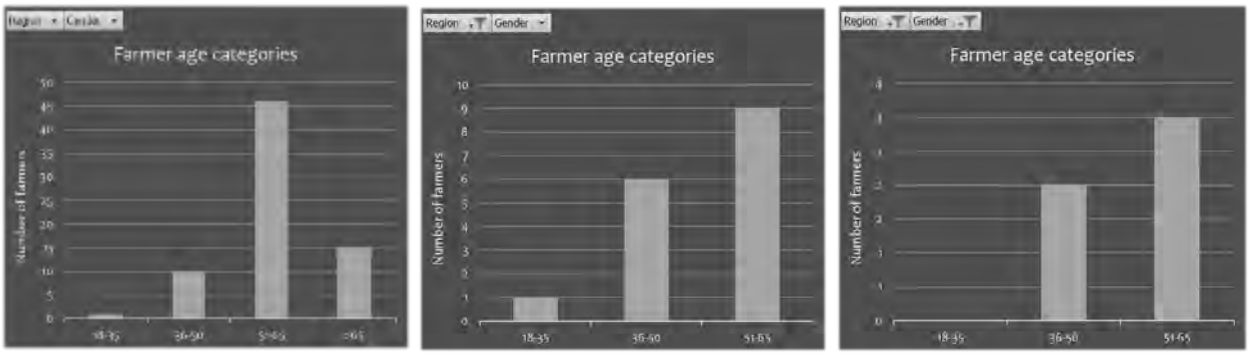


Figure 25:The figures above indicate the number of farmers per age category for 1 – all regions; 2 – Matatiele, EC; and 3 – male participants in Matatiele, EC.

The figures below provide an example of the **absorptive dashboard** using the improved soil health indicator.

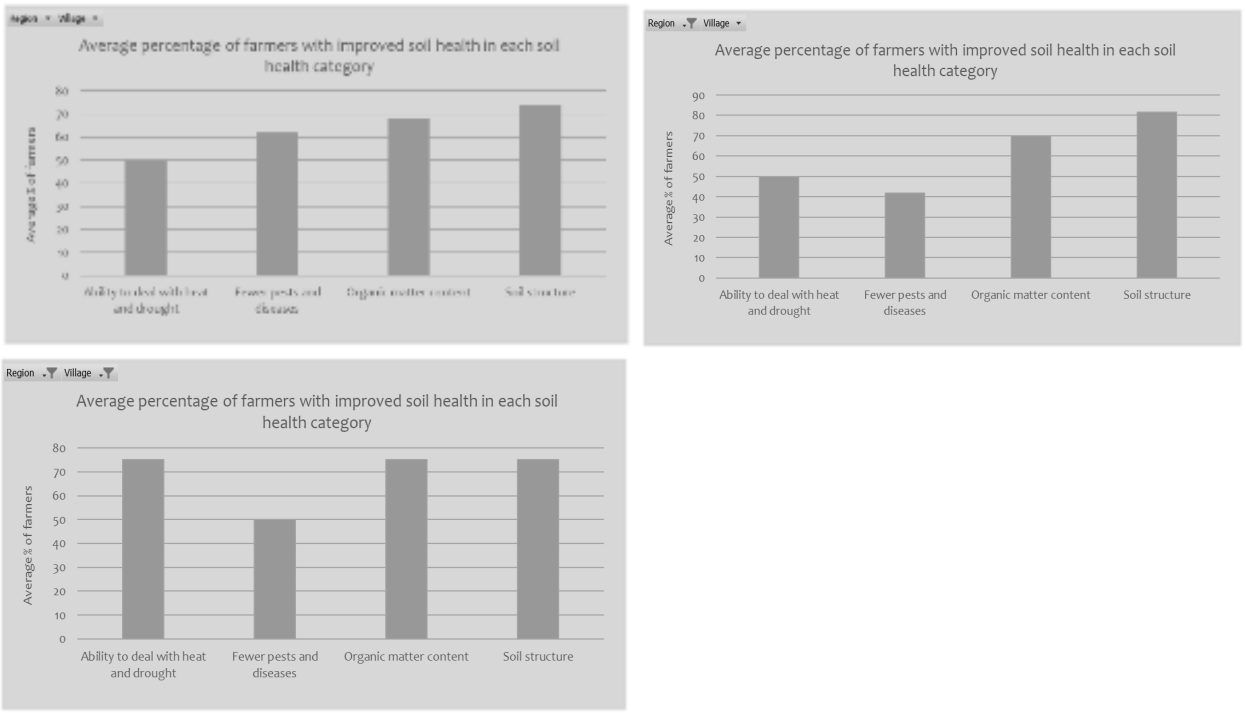


Figure 26: Tables showing the percentage of farmers with improved soil health for all regions (3 provinces), then Limpopo province, and The Willows village within Limpopo province.

It is thus possible to provide comparative analysis across regions and between villages for all the indicators provided in the resilience dashboard.

It is also possible to summarise data per region. This includes more in-depth socio-economic data than can be found in the three main dashboard pages. Several specific tables have been created from the main data table to analyse specific information, including:

- Productivity
- Product prices
- CRA practices
- Collaborative action groups
- Knowledge sharing
- Water use efficiency
- Soil health
- Traditional practices
- Savings
- Loans
- Livelihoods
- Farming activities
- Water sources
- Growing season
- Crop rotation
- Livestock integration

From this information, a series of pivot tables and other data visualisations are created and summarised onto one page for the region. It is again possible to compare information between villages in each of the regions for the pivot tables in these pages. An example of the number of years participants have been practising CRA in Matatiele, EC, is provided in Figure 27.

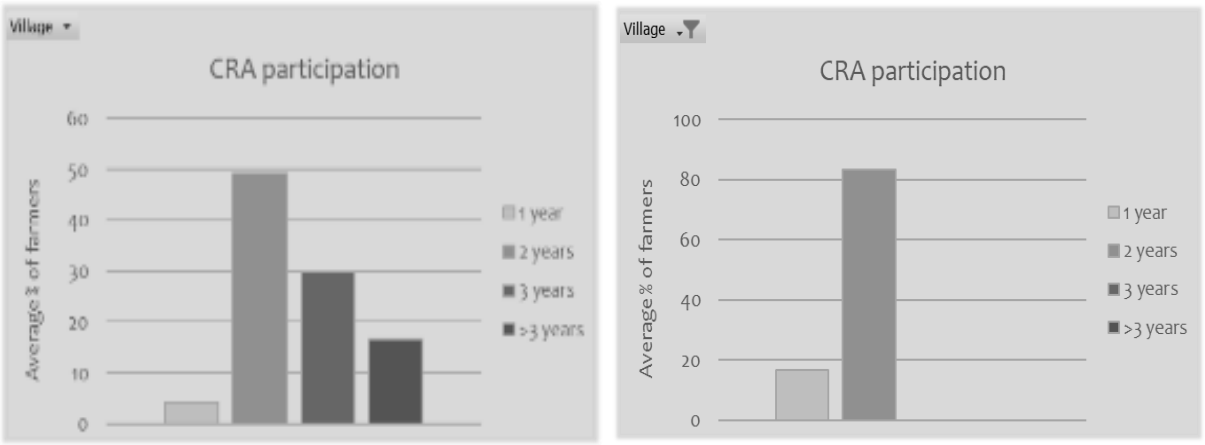


Figure 27: Average percentage of farmers who have practised CRA for 1, 2, 3, and>3 years for 1 – Matatiele (4 villages) and 2 –Ned village only.

7.1.3 One-page summaries

In this section, the one-page summaries for the CbCCA programme conducted between 2022–2025 under BMZ-SODI are provided. This initiative consisted of working in twenty-six villages across four regions and three provinces to improve the resilience of smallholder farmers using a suite of activities and interventions, and formed the basis for the development of the climate resilience impact dashboards.
A total of one hundred individual interviews were undertaken between October 2024 and March 2025, and this data was used to develop the following regional summaries for Mametja-Sekororo (Limpopo), Matatiele (Eastern Cape), Bergville (KwaZulu-Natal), and Midlands (KwaZulu-Natal).

The one-page summary for Mametja-Sekororo (Limpopo) is provided as an example in Figure 28 below.

Figure 28: One-page summary of resilience snapshots for Limpopo, November 2024.

A further section in the manual provides a case study using the climate resilience dashboard to summarise implementation impact of the SODI-BMZ CBCCA programme. The case study is conceptualised as a summary of information for each of the indicator sets and provides examples from each of the four regions rather than a comprehensive comparison. The intention is to demonstrate how this dashboard can be used in impactful reporting.

Taken together, the resilience snapshot system provides MDF with a **dynamic, evidence-based picture of change**. It links individual stories to regional trends, combines social and ecological data, and makes it possible to see not only whether farmers are coping with climate change, but whether they are becoming more resilient over time.

7.2 TABLE OF CONTENTS: CLIMATE RESILIENCE IMPACT MEASUREMENT FOR POOR RURAL COMMUNITIES: A MERL MANUAL FOR COMMUNITY-BASED CLIMATE CHANGE ADAPTATION (CBCCA)

CHAPTER 8: COMMUNITY-OWNED WATER ACCESS: GUIDELINES AND CASE STUDIES

8.1 SUMMARY

The purpose of these guidelines is to present a community-based approach that builds alliances between communities and development agencies and promotes joint actions and social accountability as a key strategy for providing water services to rural communities. A water service may include protected springs and wetlands, streams and rivers, borehole hand-pumps, or fully mechanised piped water systems. Municipalities are obligated by the Water Services Act number 108 of 1997 to provide communities with reliable water services. The right to safe, reliable, affordable, and sustainable access is also enshrined in the Constitution of South Africa. However, municipalities are yet to integrate decentralised and community-based management as one of the strategies for delivering water services to rural communities.

The water service challenges in rural South Africa since 1994 stem in part from a lack of collaboration between municipalities and community-based organizations. Municipalities resist community-based management, hindering decentralized water systems (Buthelezi, 2006).This reluctance contributes to poor quality, inadequate, unaffordable, and inequitable water access in rural areas. The first major problem is the reluctance of municipalities to view community organizations as partners in delivering water services, leading to a reproduction of poverty penalties, particularly affecting young girls and women who spend excessive time fetching water (Geere & Cortobius, 2017).

The second issue arises when stand-alone rural water schemes break down for extended periods, denying communities their constitutional right to safe and reliable water. Despite causes like theft and vandalism, municipalities are obligated to provide water services. In breakdown situations, communities resort to alternative sources like springs and rivers, which may lack safety and affordability.

Collaborative and co-management options for management of water access presently include a range of options, which are supported informally at the institutional level, depending on the will and orientation of local officials. These include, for example:

- Liaison with Ward councillors regarding implementation and management of state-provided infrastructure.
- Employment of local operators through the WSA who are managed at the local level by village-level water committees, often linked to the ward councillors and/or the traditional council, and a voluntary water committee.
- Ad hoc maintenance of infrastructure at the community level through these voluntary water committees, which include community contributions and local-level maintenance.
- Organisation of the local communities into management areas or sections to effect more participatory maintenance and management, and
- Various levels of self-supply options, which include individuals and groups.

The new policy environment has created a discrepancy between the legal recognition of the efforts and capacities of community members and their actual role in water service delivery. Local politicians and government officials perceive community members as consumers whose role is to avoid vandalism and to save water, to make it easy for the municipality to implement projects, or to express their wishes in the consultations for the Integrated Development Plan10 (IDP). These same community members, however, construct, improve, operate, and maintain water infrastructure and fill the gaps in public service delivery. These schemes vary in complexity, ranging from individual wells to collectively owned, piped water schemes (Hofstetter, van Koppen, & Bolding, 2021).

These guidelines promote an alternative institutional mechanism that is built on multi-stakeholder dialogue, action, and accountability at the village level. In this document, we have coined the concept of village water dialogues to describe an alternative and decentralised mechanism for delivering water services to rural communities. It is an attempt to promote a management mechanism that would see rural communities collaborating with public organisations.

Village water dialogues is a non-confrontational advocacy approach that empowers communities to engage directly with the representatives of public organisations to improve the quality of water and related services. Village water dialogues are action and solution-oriented, where all parties agree on ways for improving water services and social accountability indicators. It is based on the notion of active citizenship, where citizens and

public organisations hold one another accountable in matters of public service. There are three main phases of village water dialogues.

- The first phase is concerned with community education on citizens' rights and corresponding responsibilities, water sector stakeholders, and public service communication platforms. This phase is also concerned with strengthening the institutional capacity of communities to engage with public organisations. The main outcome of this phase is an empowered water community representative institution that can engage in a constructive dialogue with public organisations on matters that are related to water services.
- The second phase is the heart of village water dialogues. A community representative structure engages with public organisations and finds a sustainable solution to resolve water problems in a community. There are two main outcomes of this phase. The first outcome is a well-packaged water project and action plan. The second outcome is a social accountability plan, which defines and assigns roles and responsibilities of community members in making a water project successful and sustainable. Cost recovery is a key component of a community accountability plan.
- The final phase is concerned with the implementation of a water project. During this phase, community members monitor all the processes that are involved in the implementation, operations, and maintenance of a water project. The main outcome of this phase is a sustainability plan. The focus of a sustainability plan is conservation and protection of water sources and includes the requirements that water supply systems should cause little or no harm to the ecosystem and should ensure that the needs of future generations are not compromised. Therefore, a water system is deemed sustainable when it does not over-exploit the water resource and the system is protected to avoid water contamination. In addition, a community-managed water system is sustainable when it can recover operational costs and is properly operated and maintained to supply adequate uncontaminated water to the users.

Activities proposed in these phases call for the reintegration of community-based management models into rural water services provision.

Guidelines for community-level engagement, governance structures, constitution of local water committees, operation and maintenance, and cost recovery options are outlined. Recommendations for water service authorities and providers are also outlined.

Three case studies analyse examples of different types of self-supply options that are already being tried out and give recommendations to guide further implementation:

- **Co-management of water supply services**: Here, Mvula Trust implementation processes from pre-1994 are analysed. This includes the state of these schemes presently, under the new water act, with the municipal mandates for provision and management. Another example is a recently completed WRC initiative considering co-management options, the Giyani Local Scale Climate Resilience Project.
- **Community-owned water access schemes:** Supported self-supply options in Sekororo, Limpopo, and Bergville, KwaZulu-Natal, as presented. Sources include boreholes and springs. The participatory planning, implementation, and management processes for these schemes are analysed, as are the learnings. Broad recommendations for further implementation are provided.

Chapter summaries for this manual are provided in the sections below.

8.1.1 Introduction

This manual sets out a practical and rights-based approach for developing community-managed rural water supply systems that can provide water that is adequate, safe, reliable, affordable, equitable, and sustainable, in line with South Africa's constitutional and legislative obligations. It recognises that rural communities depend on water not only for domestic use but also for productive livelihoods and therefore promotes multiple water sources and multiple-use systems, ranging from protected springs, wetlands, and rivers to boreholes, hand pumps, and fully mechanised piped schemes. The intention is not to replace municipalities, which are legally mandated under the Water Services Act of 1997 to provide water services, but to build alliances between communities, municipalities, and development agencies so that water provision becomes more responsive, accountable, and sustainable, particularly in areas that have long been underserved.

Despite strong policy statements supporting multiple-use water services and community involvement, rural water delivery in South Africa remains constrained by weak legal and institutional frameworks for decentralised and community-based management. Municipalities continue to act as the sole water service authorities and

providers, and water service committees only exist if communities formally petition the Minister to reinstate them. This has created a persistent gap between what policy promises and what rural people experience on the ground. One of the most serious consequences is that municipalities often refuse to see community organisations as partners, which undermines decentralised water systems and reinforces poverty, especially for women and girls who lose time, safety, and opportunity when they have to fetch water over long distances. When water schemes break down for extended periods, communities are left without their constitutional right to safe water and are forced to rely on unsafe or costly alternatives such as rivers and springs, even though municipalities remain legally responsible for service provision.

These challenges are compounded by the spatial legacy of apartheid, which left many rural areas without basic infrastructure. Ongoing migration, both into and out of rural areas, further complicates the planning, financing, and maintenance of water systems, resulting in schemes that are either too small for growing populations or too large for shrinking ones. These geospatial and institutional failures undermine public health, increase vulnerability, and waste scarce public and household resources. While various forms of co-management already exist informally, such as ward councillor liaison, village-level water committees, local operators, voluntary maintenance groups, and self-supply systems, these arrangements are fragile, uneven, and dependent on the goodwill of individual officials rather than on clear policy and legal recognition. At the same time, communities have shown a strong willingness to take responsibility for water management because they urgently need water not only for household use but also for farming and income generation, especially in places like Limpopo, where self-supply systems are already widespread.

South Africa's legislative framework does, in fact, provide several entry points for community-based and self-supply water systems. The Constitution affirms the right to sufficient water, while the National Water Act promotes participatory governance, equity, and sustainability, and allows for community-level institutions such as water-user associations. The Water Services Act defines the roles of authorities, providers, and consumers, and national strategies such as the Strategic Framework for Water Services, the National Development Plan, and the National Water Resource Strategy explicitly recognise community-owned water access as a viable solution for rural areas. Environmental law, through NEMA, further requires that water-related developments respect principles of sustainability and environmental justice. However, when responsibility for water provision was transferred from the national department to municipalities in 2000, the institutional space for community-managed schemes was effectively dismantled, as formalisation replaced voluntary local management and community water committees were excluded from operations and maintenance.

Current law still allows limited forms of self-supply. Under Schedule 1 of the National Water Act, households may use water for domestic and subsistence purposes, including for animals kept for household use, provided that the use is lawful and not commercial. The Water Services Act also allows communities to become Water Services Providers or Water Services Committees, but in practice, these options are burdened by complex registration and approval processes that most rural communities cannot easily navigate. Even so, municipalities are required to support self-supply by promoting alternative water sources such as groundwater and rainwater harvesting, ensuring protection of springs and aquifers, providing advice, monitoring water use, enabling point-of-use treatment, revising by-laws, and educating users about hygiene and conservation. However, a disconnect persists where communities are treated as passive consumers in planning processes, while in practice they build, manage, and maintain much of the water infrastructure themselves, from simple wells to collectively owned piped schemes. The manual, therefore, argues that recognising and strengthening these existing community efforts is essential if South Africa is to achieve equitable, resilient, and sustainable rural water services.

8.1.2 Rural water service provision experiences in South Africa

This chapter traces how rural water services in South Africa have been delivered through different institutional and community-based approaches over time, showing how historical experience, social organisation, and changing political contexts shape what is possible today. Long before modern water policies existed, communities governed and managed water collectively through local rules, shared labour, and customary authority. These systems were not static: as societies changed, new challenges emerged, requiring new ways of organising water access. Understanding this long tradition of community water management is essential for designing approaches that are appropriate to present-day realities rather than simply imposing technical or bureaucratic solutions.

Before the democratic transition in 1994, rural water services in KwaZulu were provided through regional councils that functioned as local government structures dominated by traditional authorities. AmaKhosi and their councils played a central role in deciding how projects were implemented, operated, and maintained. This period coincided with strong international donor and NGO interest in rural development, which supported a

wave of community water projects such as spring protection, gravity-fed reticulation systems, and borehole hand pumps. Water committees and umbrella development structures were formed, trained, and expected to mobilise labour, oversee implementation, elect volunteers, and ensure ongoing communication with the community. These committees also relied on traditional councils to enforce compliance, including dealing with defaulters. In practice, these arrangements enabled communities and development agencies to draw on local knowledge and social organisation to make projects work, but they also reproduced power imbalances. Community organisations were often dominated by elites aligned with traditional authorities and homeland governments, and the voices of women, youth, and the poorest households were frequently marginalised. While this era demonstrated that community-based management could function, it also showed that participation was shaped by broader patterns of patriarchy, hierarchy, and political control. Importantly, today's young people are far less willing to accept unquestioned authority, meaning that approaches that once worked are now more likely to be contested and must be adapted to more democratic and inclusive expectations.

At the beginning of the democratic era, new institutional actors such as the Mvula Trust were created to support the Department of Water Affairs and Forestry in extending sustainable water services to rural communities. At the same time, non-governmental organisations continued to play a central role, guided by participatory and sustainable development thinking. Their approach placed people at the centre of development, recognising that communities understand their own vulnerabilities and have practical knowledge of how to address them. NGOs promoted local organisations as key development agents, used sustainable livelihoods frameworks to analyse poverty and risk, and designed water supply systems around lived experience rather than technical blueprints alone. Community-based management became a defining feature, with decision-making decentralised as far as possible and communities actively involved in planning, implementation, operation, and maintenance. These processes were deliberately iterative, allowing learning, adaptation, and social equity considerations to shape how systems evolved. The underlying philosophy was that water cannot be separated from other aspects of life: when livelihoods, health, social relations, or governance fail, water insecurity increases, and effective participation must therefore address the whole fabric of community life.

Alongside NGO-led approaches, the government also attempted a large-scale collaborative model through the Build, Operate, Train and Transfer programme introduced in 1997. This public–private partnership aimed to accelerate service delivery in former homelands by using private implementing agents to build and run schemes while training communities to take them over. In principle, BOTT sought to combine efficiency, skills development, job creation, and community empowerment. Community-based water institutions were supposed to be established and mentored during construction and then given responsibility for operating and maintaining the schemes. In practice, however, the model became heavily centralised and driven by private-sector priorities, making it expensive and weakening both local government and non-profit organisations. When the Water Services Act was implemented in 2001, and municipalities became the sole authorities and providers, community institutions were marginalised and often left unprepared for the transfer of responsibilities. This created lasting resentment between municipalities, NGOs, and community-based water groups, undermining trust in collaborative management.

Against this background, community-owned and community-managed water access has re-emerged as a critical option. Such decentralised models have the potential to make water systems more resilient and sustainable, better suited to local needs and more just in how water is allocated, especially for marginalised groups. They can strengthen social cohesion, build local agency, and reduce dependence on distant institutions. Yet these benefits are constrained by real challenges, including weak technical and financial capacity, unclear legal recognition, poor coordination between stakeholders, and limited monitoring and accountability mechanisms.

Two broad models now dominate thinking about rural water provision. The first is self-supply, where communities or households independently construct and manage their own water infrastructure. Despite major public investments since apartheid, many rural people still rely on self-built wells, protected springs, gravity-fed schemes, and small piped networks that they finance, govern, and maintain themselves. These systems operate outside formal regulation but provide essential services to millions. They show that communities are willing and able to take responsibility for water when the state cannot, and they offer valuable lessons for improving public service delivery. Self-supply is incremental and flexible: users choose technologies, funding mechanisms, and levels of service that fit their circumstances, often favouring low-cost, gravity-fed systems and protected natural sources. Historically, NGOs and donors supported blended self-supply models by helping communities raise funds, form water institutions, and develop skills, but municipalities have rarely adopted this approach.

The second model involves co-managed water supply, where municipalities and communities jointly plan, operate and maintain systems. Although this happens in practice in many places, it currently lacks formal legal and procedural support and depends heavily on the goodwill and commitment of individual officials and

community leaders. There is a growing recognition that such collaboration must be institutionalised if rural water services are to become more equitable, efficient, and sustainable. Together, these experiences show that neither state control nor community action alone is sufficient: resilient rural water systems depend on partnerships that combine local knowledge, social organisation, and public responsibility in ways that can adapt to changing environmental, economic, and social conditions.

8.1.3 Guidelines

This chapter sets out a strong argument that rural water services in South Africa will only become reliable, equitable and sustainable if communities are treated not as passive recipients of infrastructure, but as active partners in governance, operation, and accountability. At the centre of this approach is the idea of village water dialogues, which are proposed as a practical and decentralised way to rebuild collaboration between rural communities and public institutions. Rather than relying on protest, litigation or top-down project delivery, village water dialogues are designed as non-confrontational, solution-focused spaces in which communities and public agencies jointly analyse problems, agree on actions, and hold one another accountable. In this model, water provision becomes a shared responsibility shaped through continuous engagement, not a once-off technical intervention.

The recommended approach begins by investing in community capacity. People need to understand their rights to water, the responsibilities that come with those rights, the institutional landscape of the water sector, and the channels through which they can engage municipalities and service providers. This education and institutional strengthening are essential because meaningful participation requires more than being consulted; it requires communities to have the confidence, information, and organisational structures needed to negotiate on equal terms with the government. When this foundation is in place, communities can work with public agencies to develop realistic water projects and action plans, together with social accountability arrangements that define who does what, how costs will be shared, and how the system will be monitored. Cost recovery, even at modest levels, is treated as a necessary part of sustainability, not simply a financial exercise but a way of reinforcing collective responsibility. Implementation then becomes a joint process in which communities monitor construction, operation and maintenance while also taking responsibility for protecting water sources and ensuring that the system does not degrade ecosystems or undermine the needs of future generations.

Underlying these recommendations is a recognition that rural water systems are social as much as technical. Every household must understand the limits of water availability, the operating rules of the system, and the consequences of misuse. In rural areas, where formal billing and enforcement mechanisms are weak or absent, the chapter argues that regulation through participation is more effective than regulation through coercion. When people are part of the design, planning, and governance of a system, they are more likely to respect its rules and less likely to compete destructively for scarce resources. This requires continuous engagement, transparent communication, and honest explanation of how plans change over time, especially when budgets, technical constraints, or environmental conditions force adjustments to what was originally proposed. Rather than avoiding difficult conversations, service providers are encouraged to be open about trade-offs, because this builds trust and strengthens community understanding of the realities of water provision.

The chapter also emphasises the need for strong but inclusive local governance structures. Water committees already exist in most villages and provide a basis for organisation, but they are informal, voluntary, and vulnerable to abuse of power or exclusion of the poorest. While some level of local control and even limited benefits for committee members can help keep systems running, external facilitation is often needed to prevent elite capture and to ensure that vulnerable households are not denied access to a basic service. Traditional councils are seen as potentially valuable oversight bodies that can help manage conflict and provide legitimacy, but their role must be clearly negotiated and embedded in broader systems of accountability. Local water committees should be widely representative, including traditional and municipal councillors, water service providers, farmers, churches, schools, and ordinary households, both those with their own water sources and those fully dependent on communal systems. These committees should operate under clear constitutions, manage maintenance and security, and organise protection of infrastructure, whether through community patrols, household monitoring, or paid guards supported by local contributions.

A major set of recommendations concerns operation and maintenance, which the chapter portrays as one of the most underestimated aspects of rural water supply. Reliable O&M requires trained people, spare parts, tools, transport, reporting systems, and predictable funding. Communities are capable of handling routine tasks such as fixing taps, managing valves, and reporting leaks, but they struggle when pumps fail, electrical systems break or specialised parts are needed. This is where partnerships with municipalities and technical agencies

become critical. Preventative maintenance depends on proactive planning and shared responsibility rather than waiting for crises.

Cost recovery is treated pragmatically, with a recognition of widespread poverty. Modest monthly fees, around R20 per household, are seen as feasible in places like Giyani, although they will never cover full costs. The challenge is to collect these contributions without creating conflict or excluding the poorest. Possible solutions include keeping records of who pays, dividing villages into smaller sections to manage contributions, or linking payments to local savings groups such as stokvels and village savings and loan associations. Yet all these approaches risk marginalising vulnerable households, which leads to the core recommendation that better-off users, especially those accessing larger volumes of water, should cross-subsidise poorer households through tariffs linked to usage. In this way, the right to water is protected while still generating some revenue for maintenance and repairs.

Finally, the chapter makes clear recommendations for water service providers and authorities. Municipalities and national agencies are urged to create enabling environments for community engagement, to align their policies with community-based management, to simplify institutional requirements, and to provide incentives and financing mechanisms that support local participation rather than undermine it. Education on water, sanitation, conservation, and quality should be widely available, and punitive approaches to informal connections or self-supply should be replaced with supportive, non-punitive frameworks. Engagement must go beyond committees to include whole communities, and governance systems should be respected but also challenged where they perpetuate inequality. Powerful households should not be allowed to monopolise water, and where higher levels of use are unavoidable, they should contribute more to communal funds. Continuous monitoring of water resources, especially boreholes, is also recommended, supported by simple tools such as dip meters and clear reporting lines so that over-use can be detected and managed before systems fail.

Taken together, these recommendations outline a model of rural water provision that is decentralised, participatory, and adaptive. By combining community knowledge, local governance, modest but fair cost recovery, and supportive public institutions, the chapter argues that rural water systems can become more resilient, more equitable, and more capable of meeting both present and future needs.

8.1.4 Case studies

8.1.4.1 Re-imagining Co-management of Rural Water Services

South Africa's rural water crisis is rooted in a deep mismatch between constitutional expectations and institutional reality. While municipalities are legally obligated under the Water Services Act to provide safe, affordable, and reliable water, in practice, many rural schemes are broken, under-maintained, or unequally accessed. The recent changes to the National Water Act have opened the door for public–private partnerships and self-supply, but the institutional mechanisms for these options remain weak or undefined. Against this background, the chapter argues for a shift away from adversarial relationships between communities and municipalities toward cooperative co-management, grounded in participation, local ownership, and shared responsibility.

The core insight is that community participation must precede and enable community-based management. Communities are already deeply involved in water provision, whether through illegal yard connections, self-funded boreholes, or ad hoc maintenance of communal infrastructure. What is missing is a formalised, supported, and accountable way for this local effort to be integrated into public water governance. Village Water Dialogues (VWDs) are presented to rebuild communication and trust between communities, municipalities, and NGOs, replacing conflict with joint problem-solving.

Historical experience shows that this approach is viable. Action research from the late apartheid and early transition period, including projects in Relela, KwaHlophe, KwaNyuswa and Mnywaneni, demonstrated that when communities were supported by NGOs such as the Mvula Trust, they were able to mobilise funds, manage infrastructure, and maintain water systems over long periods. These schemes worked because communities controlled the governance, operations, and cost recovery through local water committees, while external agencies focused on facilitation, technical support, and accountability rather than direct control.

The key lesson from this history is that sustainable rural water systems depend on strong community institutions that can mobilise household contributions and manage a water fund for maintenance and upgrades. External agencies should support rather than replace these institutions, as heavy-handed intervention weakens local ownership and undermines long-term sustainability.

8.1.4.2 What Co-management Looks Like in Practice: Mnywaneni and Mayephu

The Mnywaneni community water supply scheme, implemented more than 22 years ago by the Mvula Trust, provides a powerful example of long-term sustainability. Originally serving around eighty households and now supplying about 150, the scheme draws water from a spring above the village and gravity-feeds it into a 10 kL ferro-cement tank that supplies communal standpipes (Figure 29). Households later added their own yard connections, albeit informally, showing how people adapt infrastructure to meet their needs.

Figure 29: Pictures showing communal standpipes set up by Mvula Trust and a private yard connection subsequently undertaken by some of the households themselves (illegal connections)

Under the original model, the Mvula Trust required the community to contribute financially to construction and then trained a local water committee to manage funds, employ caretakers, and oversee operations. Standpipe wardens, usually women living close to taps, managed access and collected monthly fees, which were deposited in a bank account and reported back to the community. Para-technicians were trained to maintain pumps, valves, and reservoirs. This tight link between payment, management, and accountability kept the system functioning.

When responsibility shifted to the municipality in 2001, this structure was weakened. Standpipe wardens were replaced by a single municipal caretaker, payments were replaced by free basic water, and decision-making moved to the ward committee. Despite this, Mnywaneni continues to function because it is a small, gravity-fed scheme with reliable springs and strong social cohesion. In contrast, the much larger KwaThathani scheme, serving about 850 households from a single borehole, collapsed under the weight of high demand, vandalism, electricity failures, and lack of regulation. This comparison highlights that scale, technology, and governance all matter: small, gravity-based, community-managed schemes are inherently more resilient than large, centralised, poorly regulated systems.

The Mayephu case study in Giyani illustrates what co-management looks like today in a more complex and stressed environment. Mayephu has 365 households and 2,000 people, supplied by three boreholes pumping into a 700 kL header tank (Figure 30). Because pumping capacity is limited and electricity is unreliable, water is pumped continuously for six days and released to the community only on Fridays. Households store water in containers, drums, and JoJo tanks to last the week.

Figure 30: A view of the 700 kL village header tank in Mayephu and one of the boreholes supplying this tank fitted with electricity from both a power line and solar panels, for dual supply

Water access in Mayephu is highly unequal. About 20% of households fetch water from communal standpipes using wheelbarrows and 20-litre containers, often accessing less than 25 litres per person per day. Around 80% have illegal yard connections, giving them 25–50 litres per person per day. A smaller group of powerful households has large JoJo tanks or private boreholes, allowing them more than ninety or even two hundred litres per person per day (Figure 31). These disparities directly affect livelihoods: households with private boreholes can maintain two hundred–400 m² gardens, while poorer households can barely water small plots or livestock.

Figure 31: Water access options in Mayephu village: communal standpipes, yard connections with some storage, private boreholes with more substantial storage

Despite these inequalities, the village has developed an informal but functional management system. A water committee of fifteen members, including traditional leaders and cooperatives, works with a municipal pump operator to manage pumping and distribution. Households closest to infrastructure informally monitor it, and conflicts are handled through the traditional council. This arrangement, shown in Figure 32, has kept the system stable, but it still excludes vulnerable households and lacks technical and financial transparency.

Figure 32: Venn diagram of relationships in the community around the water committee.

8.1.4.3 Building the Future: Multiple-Use Systems and Community Water Dialogues

The section argues that rural water systems must be designed not only for drinking but for livelihoods. The concept of Multiple-Use Systems (MUS) recognises that households use water for gardens, livestock, small businesses, and cultural practices, all of which contribute to food security and income. Figure 33 illustrates how water sources, uses and benefits are linked in a MUS.

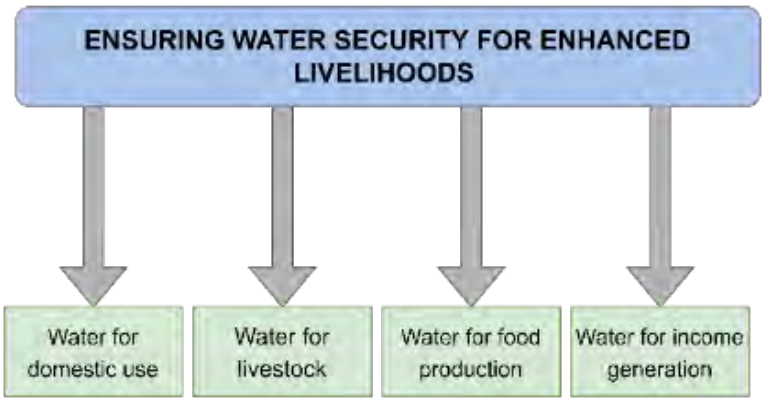


Figure 33: The key components of a MUS.

The Domestic-Plus or MUS water ladder (Figure 34) shows how higher levels of service unlock greater livelihood opportunities. While basic services of twenty-five litres per person per day are essential, they are not enough for poverty reduction. In places like Mayephu, people already move up this ladder through informal means, using yard connections, tanks, and private boreholes. Policy now recognises this reality: the 2017 national norms allow for self-supply, yard taps, and even intermittent supply of 1,500 litres per household per week, provided some form of measurement and equity is applied.

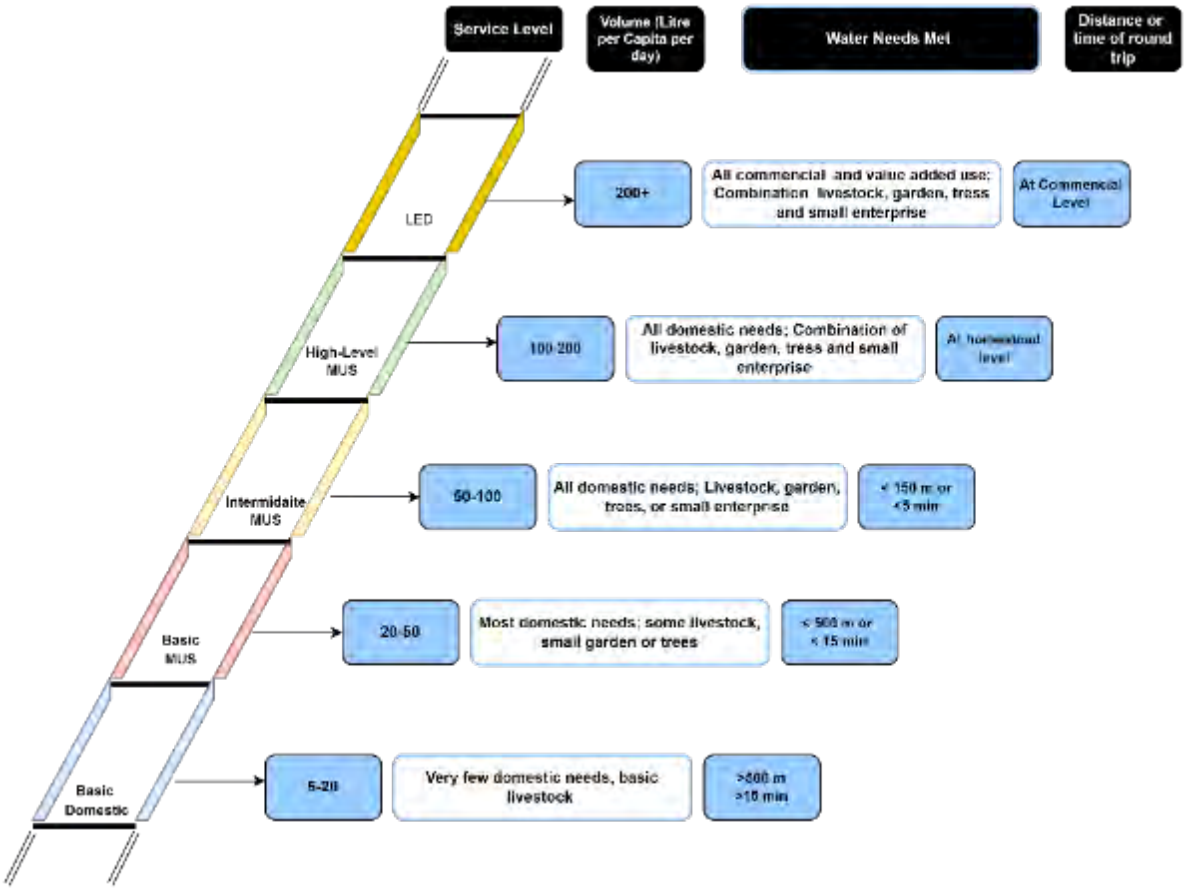


Figure 34: The Domestic Paus and MUS water ladder. Higher levels of service provide more income options (stepping up the ladder) (Source: Renwick et al., 2007; van Koppen et al., 2009)

Community Water Dialogues are the mechanism proposed to make this transition fair and manageable. In Mayephu, a facilitated dialogue involving traditional leaders, the water committee, and about fifty residents allowed people to openly discuss who gets water, who pays, and how the system should evolve. The community agreed in principle that those using more water should contribute financially, that yard connections should be regulated, and that poorer households relying on communal taps should not be burdened with fees.

They also identified practical steps: refurbishing unused boreholes, installing valves to rotate supply between village sections, fitting water-level gauges and dip meters, and creating a security roster for the new solar pumping system. These measures would allow the community to understand how much water is available, distribute it more fairly, and protect the infrastructure.

The Mayephu experience shows that even under severe constraints – climate change, declining groundwater, load-shedding, and inequality – communities can manage complex systems when they are given information, space to deliberate, and support from NGOs and government. While legal and institutional barriers remain, the combination of co-management, multiple-use planning, and community dialogue offers a practical pathway toward more resilient, equitable, and productive rural water systems.

8.1.5 Case examples: community-owned water schemes

8.1.5.1 Why Community-Owned Water Systems Matter

Community-managed water systems represent a return to an old but powerful idea: people who depend on a water source are often best placed to protect, manage, and sustain it. Long before modern water bureaucracies, rural communities governed springs, streams, and wells through local rules, labour contributions, and collective responsibility. This chapter shows how these traditions are being revived in modern forms through self-supply and blended self-supply, where communities work either independently or in partnership with NGOs and, sometimes, municipalities.

At the centre of this approach is community ownership, not only of infrastructure, but also of decisions, responsibilities, and risks. Whether the scheme is fully user-funded or supported by NGOs or the state, the community must manage governance, operations, maintenance, cost recovery, and long-term planning. External agencies do not replace communities; they strengthen them through training, facilitation, funding support, and accountability systems.

The Village Water Dialogue framework provides the structure for this process. It unfolds in three phases. First, communities organise themselves, learn about their rights and water policies, and map their own water realities using tools such as social maps, Venn diagrams, and Rivers of Life. These tools do more than generate data – they create shared understanding about who controls water, where power lies, and how past experiences shape current choices.

In the second phase, communities and NGOs jointly convert this understanding into water project proposals and action plans, defining what must be built, who will pay, who will manage it, and how accountability will be enforced. Community scorecards and monitoring tools ensure that everyone knows their role. The third phase turns plans into reality: infrastructure is built, water sources are protected, operating rules are applied, and water committees take charge of finances, maintenance, and conflict resolution. The final product is not just a pump or a pipe network, but a partnership agreement between the community and the authorities, recognising shared responsibility for sustainable water.

8.1.5.2 Boreholes and Patchwork Systems in Limpopo: Mametja-Sekororo and Turkey 2

The Limpopo case studies show both the strengths and the difficulties of self-supply in a water-scarce landscape. In Mametja-Sekororo, MDF supported four community groups to drill boreholes for multipurpose use. The project began with water walks, community mapping, and groundwater surveys. Participants were drawn from Climate Resilient Agriculture learning groups, and each person had to contribute financially, R400 to R800 in Sedawa and R500 in Turkey. These contributions were not symbolic; they created real ownership and commitment.

The outcome was mixed. Four boreholes were drilled, but only two were productive. This reshaped the social and technical design of the schemes. Table 16 below summarises what happened.

Table 24: Participants involved in planning and implementation of self-supply options in Mametja-Sekororo.

Village name	No. of participants who were initially involved	No. of participants who completed the project (direct beneficiaries)	Female/male participants	Overall indirect beneficiaries (5 members/household x 3 households)
Sedawa 1	23	16	10 ♀,6 ♂	240
Sedawa 2	22	5	3 ♀, 2 ♂	75
Turkey 1	20	15	8 ♀, 7 ♂	225
Turkey 2	20	14	8 ♀, 6 ♂	210
TOTAL	**85 (55 ♀, 30 ♂)**	**50**	**29 ♀, 21 ♂**	**750**

These numbers reveal two critical realities. First, self-supply is uncertain as not all boreholes succeed, and plans must adapt. Second, the benefits are amplified far beyond direct users through sharing among neighbours, relatives, and vulnerable households.

The Sedawa self-supply scheme eventually included nineteen households, supplied through two 5 kL header tanks. The system was carefully rationed: each household received about 2,500 litres per week, seventy-two litres per person per day, a level that supports not only drinking and washing but also gardens and livestock. Pumping was limited to once per day to protect the borehole. Despite conflicts over payments and maintenance, the scheme is still functioning three years later.

Participants describe how access to water at home transformed their lives: poultry businesses, vegetable sales, better nutrition, and far less time spent carrying water. Yet the scheme also shows the social fragility of self-supply, some members do not pay, others ignore maintenance duties, and the traditional council sometimes declines to intervene.

Turkey 2 presents a very different picture: a large village of about eight hundred households with no municipal bulk supply for more than 35 years. Instead, a dense patchwork of self-supply systems has emerged, pipes from mountain springs, boreholes, private water sellers, old Mvula Trust lines, informal group schemes, and MDF-supported boreholes. Figure 35 captures this fragmentation: JoJo tanks replacing old cement tanks, abandoned taps, small private pipes, and shared containers.

Figure 35: Left to right. A cement rainwater harvesting tank, installed by Mvula Trust, is no longer operational and replaced by a 2,2 kL Jo-Jo tank in a household in Turkey 2. And the old Mvula Trust tap is no longer operational. A small pipe from an individual borehole and collection containers for a group-based scheme.

Access is unequal and expensive. Poor households may pay R5 for twenty-five litres or R350 to fill a JoJo tank, while wealthier families have private boreholes. Yet the MDF-supported group in Turkey 2 shows what can work: a borehole system with elected water monitors, controlled pumping, seasonal adjustments, and strong rule enforcement. Women dominate leadership (Figure 36), and the group is willing to pay because they see where the money goes.

Figure 36: The water committee meeting in Turkey 2 (Feb 2024), showing the large proportion of women involved in the local water supply options.

What Turkey 2 reveals most clearly is that free water without reliable service destroys accountability, while local payment to local institutions builds responsibility.

8.1.5.3 Springs, Gravity, and Community Power in Stulwane (KwaZulu-Natal)

The Stulwane case shows community ownership in its most vivid form. This small village of ninety-nine households had no municipal water. Working with MDF, WWF, and engineers, residents mapped their springs and streams, assessed risks, and designed a gravity-fed system that could supply both Village A and Village B.

Community meetings (Figure 37) led to agreements on contributions (R500 per household), labour, tap locations, and governance. The system was carefully phased: first source protection and weirs, then pressure tanks, and finally reticulation to standpipes. Figure 38 shows these structures: v-boxes, shade cloth filters, and brake-pressure tanks, all built with community labour.

Figure 37: Community meeting to discuss water supply scenarios in June 2023

Figure 38: Left to right: Construction of the weir and v-box in the stream for both sections A and B. The finalised weir, with shade cloth and rocks in the inlet chamber and the brake pressure tank (92,5 kL) with pipes connected from the source and towards the header tank – also for both sections

At the same time, a municipal contractor installed a diesel-powered borehole scheme for three villages without consulting residents. The municipal system planned to provide only two taps for Stulwane, while the community scheme provided twelve taps within one hundred–200 m of homes, delivering 50–70 litres per person per day. The municipal scheme has still not delivered water, while the community system is operational.

Figure 39 shows the jointly designed layout, with two abstraction points and multiple taps per section. Governance is layered: tap groups manage local access, section committees coordinate operations, and a village water committee oversees equity and maintenance. Women and youth benefit directly, as fetching water is easier and gardens are now possible.

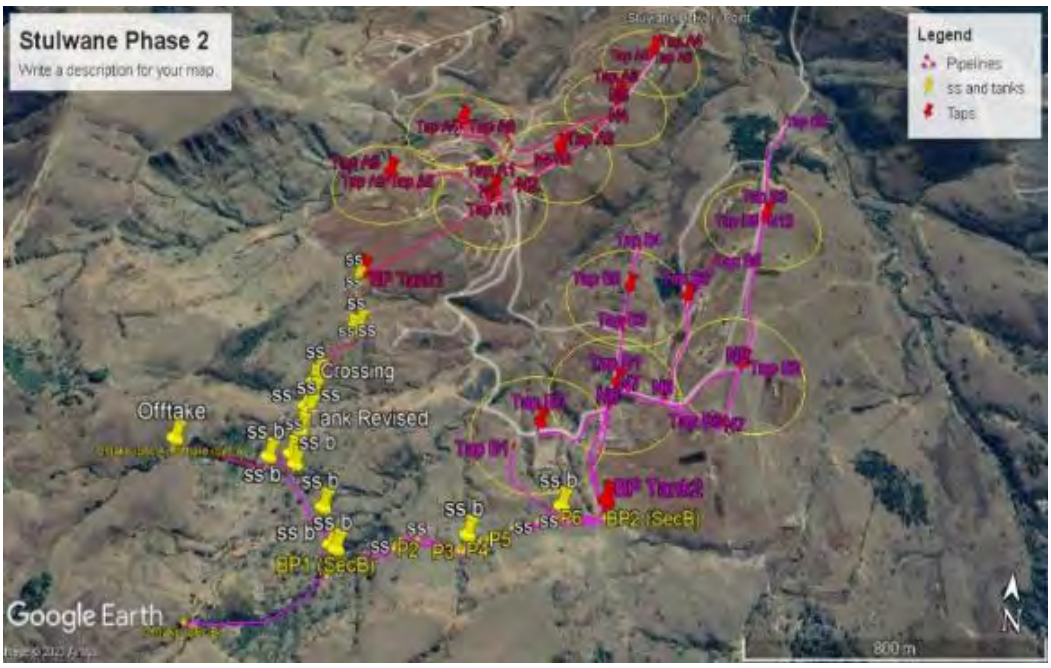


Figure 39: The layout of the self-supply schemes was designed jointly with the community.

This case shows that when communities design and manage their own systems, they create more water, more access, and more accountability than top-down schemes.

8.1.5.4 Recommendations

The case studies lead to clear and powerful recommendations for South Africa's rural water future.

First, communities must be recognised as co-owners of water systems, not just users. This means involving them from the start, not only once infrastructure is built. Policies must allow for shared governance, shared responsibility, and shared risk.

Second, capacity building is essential. Communities need training in finance, technical maintenance, governance, water quality, and conflict management. Without these skills, even the best infrastructure will fail.

Third, legal and regulatory frameworks must be updated to recognise self-supply and community-owned water schemes as legitimate components of the national water system. This includes clarifying rights, permits, water quality rules, and funding mechanisms.

Fourth, multiple-source and multiple-use systems must be standard practice. Not all water needs to be drinking quality. Springs, rainwater, boreholes, and streams can serve different purposes if properly managed.

Fifth, financing and cost recovery must be localised. People are willing to pay when money stays in the community and maintains its own system. Municipal funding and subsidies should support, not replace, local water funds.

Sixth, non-punitive, enabling policies should replace criminalisation of informal connections. Regulation should guide equity and sustainability, not punish survival.

Finally, ongoing dialogue, monitoring, and learning must become part of rural water governance. Climate change, population growth, and infrastructure wear mean that systems must constantly adapt.

If these principles are embraced, community-owned water schemes can move from being marginal experiments to becoming a central pillar of water security, resilience, and rural development in South Africa.

8.2 TABLE OF CONTENTS: COMMUNITY OWNED WATER ACCESS: GUIDELINES AND CASE STUDIES

CHAPTER 9: MULTISTAKEHOLDER PLATFORM DEVELOPMENT MANUAL: GUIDELINES FOR SUCCESSFUL IMPLEMENTATION

9.1 SUMMARY

The purpose of this manual is to provide a structured approach to developing, implementing, and sustaining multi-stakeholder platforms (MSPs) for CbCCA, by giving attention to foundational concepts, methodology and process.

The information is drawn from the author's experiences, analyses, and reviews of setting up and participating in various such platforms. It is hoped that these experiences will assist stakeholders in designing and implementing multi-stakeholder processes that effectively support community-level climate adaptation efforts at local, regional, and national levels. By doing so, these processes can enhance the reach and impact of interventions, ensuring more meaningful and sustainable outcomes.

The target audience for this manual is relevant actors and individuals in government agencies, non-government organisations, academia, the private sector, and funding agencies.
By fostering collaboration, leveraging diverse knowledge systems, and aligning local efforts with broader frameworks, multi-stakeholder platforms play a pivotal role in achieving sustainable and equitable community-based climate adaptation.

Guiding principles for multi-stakeholder platforms (MSPs) in community-based climate change adaptation (CbCCA) ensure the engagement, equity, and effectiveness of diverse stakeholders in addressing climate challenges (OECD, 2015). These principles can help foster collaboration and sustainable outcomes. By adhering to these principles, multi-stakeholder platforms can enhance the resilience of communities to climate change while fostering sustainable and inclusive development.

There are still conceptual and methodological challenges in defining adaptation goals and in what effective adaptation looks like, with several seemingly divergent approaches being used. The Climate Change Act forms the first legal framework for South Africa's response to the impacts of climate change and formalises the requirements for provincial and municipal structures to develop climate change needs analyses and implementation plans. A number of principles outlined in the act are congruent, although not explicit, in terms of community-based climate change adaptation.

There are a broad set of steps required to set up and run a multi-stakeholder platform. The details and chronology of these steps will depend on the context and members to a large extent. A section in the manual will provide a summary table of steps and then a brief example of the initiation and development of a recently established catchment forum, known as the Northern Drakensberg Collaborative.

Different monitoring and evaluation approaches for MSPs and CbCCA are discussed and a new community level resilience measurement framework and tool, developed within this research brief is outlined as an example of a framework for multistakeholder platforms engaged in CbCCA.

Chapter summaries are provided in the sections below.

9.1.1 Introduction

The purpose of this manual is to provide a structured approach to developing, implementing, and sustaining multistakeholder platforms (MSPs) for Community-based Climate Change Adaptation (CbCCA) by giving attention to foundational concepts, methodology and process.

By fostering collaboration, leveraging diverse knowledge systems, and aligning local efforts with broader frameworks, multistakeholder platforms play a pivotal role in achieving sustainable and equitable community-based climate adaptation. They do this through:

1. **Facilitating inclusive decision-making:** By bringing together diverse stakeholders and ensuring that all voices, particularly those of marginalised or vulnerable groups, are heard and integrated into adaptation strategies.

2. **Enhancing local knowledge integration:** By combining scientific knowledge with indigenous and local knowledge to create context-specific and practical solutions and by building on community insights, ensuring adaptation measures are grounded in local realities.
3. **Promoting collaboration and resource sharing:**
4. By fostering partnerships among stakeholders that enable the pooling of expertise, financial resources, and technical capacities, and by encouraging collective ownership of adaptation initiatives, thereby reducing duplication of efforts and improving efficiency.
5. **Strengthening adaptive capacity and resilience:** By empowering communities to actively participate in identifying risks, prioritising actions and implementing solutions, and by creating platforms for continuous learning and adjustment of strategies based on evolving climate conditions.
6. **Supporting policy alignment and scaling:** By bridging the gap between local actions and regional/national policies, ensuring alignment with broader climate goals; and by facilitating the scaling of successful community-based initiatives to other areas or contexts.
7. **Building trust and social cohesion**: By encouraging dialogue and collaboration among groups with varying interests, thereby building trust and reducing conflicts; and by strengthening community networks and collective action to address shared challenges.
8. **Improving accountability and transparency**: By establishing clear roles, responsibilities, and monitoring mechanisms to ensure effective governance, and by enhancing stakeholder accountability and transparent decision-making processes.
9. **Boosting financial sustainability:** By engaging diverse actors, including the private sector, to mobilise funding and investment for climate adaptation initiatives, and by promoting innovative financing mechanisms such as public-private partnerships or climate adaptation funds.

9.1.2 Foundational concepts

9.1.2.1 Climate Change, Risk, and Resilience as a Systemic Challenge

Climate change adaptation begins with a deep understanding of how people, ecosystems and institutions are already vulnerable. Rather than viewing climate risks as isolated technical problems, this chapter positions vulnerability and resilience as system-wide conditions shaped by social, economic, and environmental forces. In South Africa, this framing is supported by the National Risk and Vulnerability Framework and the National Climate Change Adaptation Strategy, which emphasise that exposure to hazards such as droughts and floods interacts with social factors like poverty, gender inequality, weak infrastructure, and governance.

The vulnerability framework commonly used in climate science, endorsed by the IPCC, expresses vulnerability as a function of exposure, sensitivity, and adaptive capacity. Exposure refers to the degree to which people or systems are affected by climate hazards. Sensitivity reflects how strongly those hazards impact them, while adaptive capacity describes their ability to cope, recover, and adjust. Together, these dimensions explain why the same drought can devastate one community while another survives with far less damage.

Resilience goes beyond vulnerability by asking whether a system can continue to function, learn and transform under stress. It includes the capacity of households to protect livelihoods, of ecosystems to regenerate, and of institutions to coordinate action. Importantly, resilience is not only about survival, but about doing so in a way that is equitable and sustainable. Poor and marginalised groups often face higher risks but have less access to information, finance, and decision-making, making them less resilient even when exposed to the same climate threats.

In South Africa, disaster risk reduction (DRR) and climate adaptation have historically been treated as separate domains, managed by different government departments. However, as climate change intensifies droughts, floods, and heatwaves, it has become clear that these must be integrated. DRR tools such as early warning systems, resilient infrastructure, ecosystem protection, and social safety nets directly support long-term climate adaptation. When embedded in community-level planning, they help households prepare, respond, and recover more effectively, rather than repeatedly falling back into crisis.

Adaptation, therefore, is not just about infrastructure or new technologies; it is about reorganising systems, food, water, land use, finance, and governance, so they can operate under changing climatic conditions. This requires coordinated action across local, district and national levels, guided by science but grounded in lived experience.

9.1.2.2 Locally Led and Community-Based Climate Adaptation

The section places strong emphasis on locally led adaptation (LLA) and community-based climate change adaptation (CbCCA) as the most effective ways to address climate vulnerability in rural and marginalised communities. These approaches recognise that people who experience climate impacts directly are best positioned to define meaningful solutions, provided they are given the authority, resources, and institutional support to do so.

The eight principles of LLA, developed by the Global Commission on Adaptation, provide a blueprint for this approach. They include devolving decision-making to the lowest appropriate level, addressing structural inequalities, providing patient and predictable funding, investing in local capabilities, building strong climate-risk knowledge, enabling flexible learning, ensuring accountability, and fostering collaboration across sectors. Together, these principles shift adaptation away from short-term projects toward long-term community resilience building.

These ideas are strongly reinforced by experience from South Africa's National Adaptation Fund and similar initiatives. Evaluations show that projects are most effective when they are holistic, locally driven, inclusive, and adaptive. Communities need time and space to understand climate risks, test solutions, learn from failures, and adapt their plans. Capacity building must cover not only technical skills but also financial management, governance, and leadership.

Community-based adaptation extends this logic into practical action. It is based on the idea that local innovation and agency are the foundation of lasting resilience. Community-based programmes integrate indigenous knowledge, scientific data, and development priorities such as food security, gender equality, and ecosystem health. They also link adaptation to the Sustainable Development Goals and disaster risk reduction, ensuring that investments in water, agriculture, or livelihoods simultaneously reduce vulnerability to future shocks.

Two figures in the chapter help to illustrate this approach.

Figure 40 shows the six domains of CbCCA: livelihood diversification, capacity building, ecosystem integrity, resource management, microfinance and insurance, and infrastructure. These domains emphasise that resilience is not built through a single intervention, but through a combination of social, economic, and ecological investments.

Figure 40: Classification of community-based adaptation activities. Source: Shammin et al. (2022)

Figure 41 presents a CbCCA systems model, which links context, process, and outcomes. The context includes climate risks, poverty, and environmental degradation. The process involves participatory planning, learning, experimentation, and collaboration between communities, government, and NGOs. The outcomes include improved livelihoods, disaster preparedness, and progress toward the SDGs. This model shows that adaptation is not linear – it is iterative, learning-based, and embedded in real-world systems.

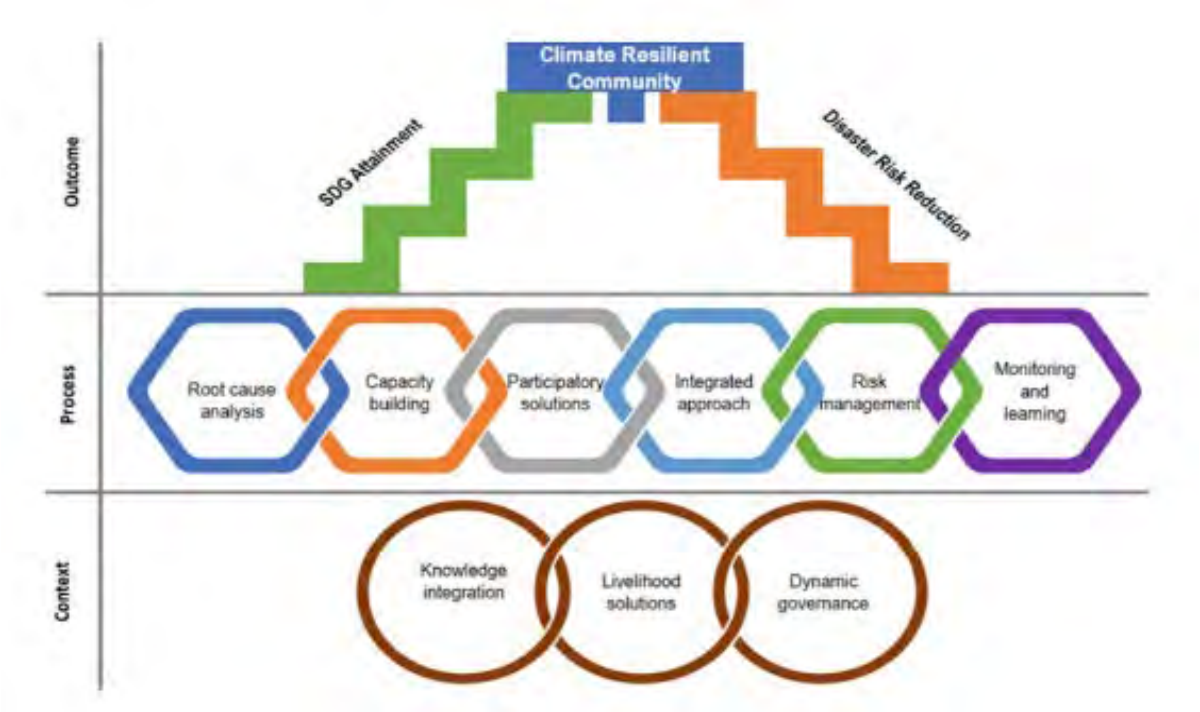


Figure 41: Community-based adaptation framework for climate adaptation and community resilience. Source: Shammin et al. (2022)

Adaptive management is the engine that allows this system to function. Rather than rigidly implementing fixed plans, adaptive management uses continuous monitoring and learning to adjust actions over time. Communities and implementing partners assess conditions, set goals, act, measure results, and revise their strategies. This cyclical process is especially important in climate contexts where rainfall patterns, water availability, and social conditions can change rapidly.

9.1.2.3 Communities of Practice and Multistakeholder Platforms

Building climate resilience at scale requires collaboration across many actors. The chapter introduces Communities of Practice (CoPs) and Multistakeholder Platforms (MSPs) as the social infrastructure that makes such collaboration possible.

CoPs operate on three interconnected levels. At the micro level, village-based learning groups bring together farmers, households, and local leaders to test climate-resilient practices such as improved farming, water conservation, or disaster preparedness. These groups function as hubs of experimentation and peer learning, supported by facilitators who act as knowledge brokers.

At the meso level, innovation platforms link multiple communities and external actors. These platforms bring together farmers, NGOs, researchers, government officials, and private-sector actors to solve problems that no single group can address alone. They enable the joint development of technologies, organisational arrangements, and policy solutions. Such platforms perform functions such as diagnosing problems, testing innovations, brokering partnerships, and scaling up successful approaches.

At the macro level, national and international networks support learning, policy reform, and funding flows. These higher-level CoPs help ensure that local innovations are recognised, supported, and replicated.

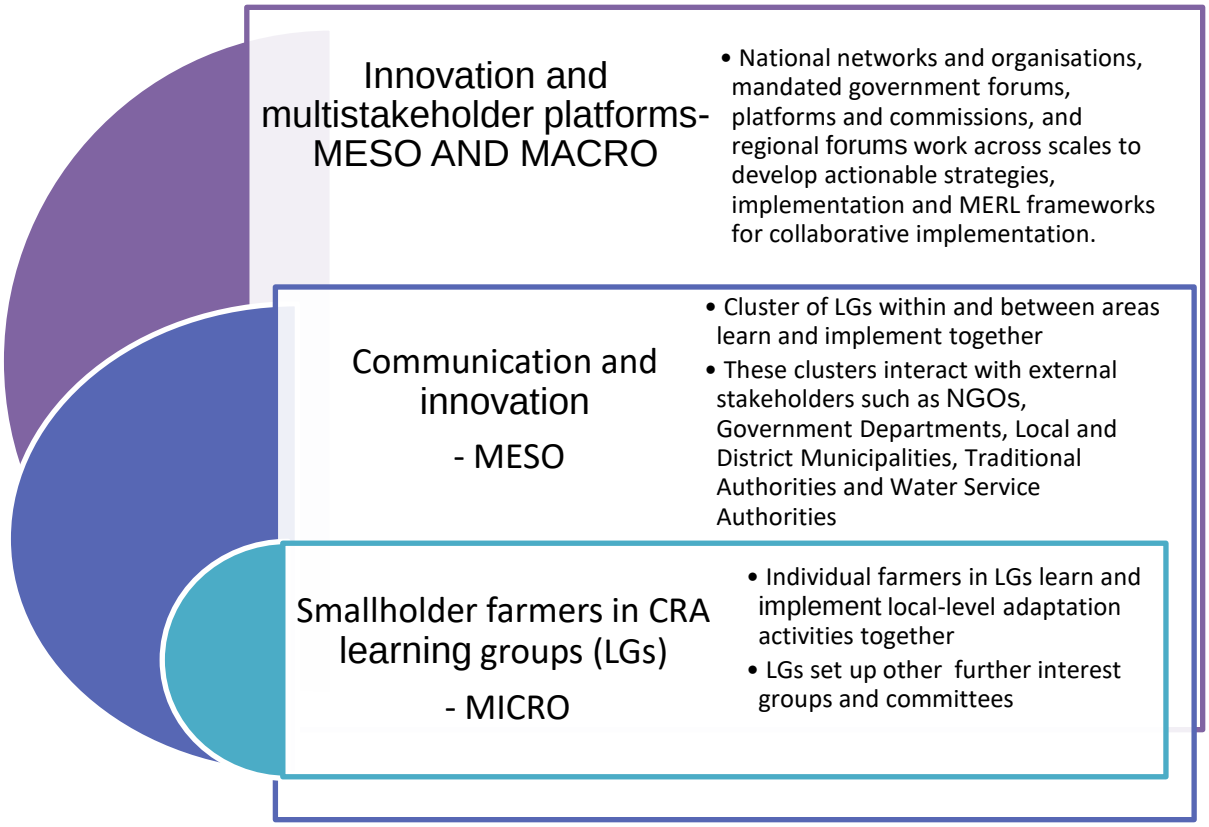


Figure 42: Micro-, meso-, and macro-level multistakeholder platforms CbCCA.

Multistakeholder platforms provide the governance space in which these interactions occur. MSPs are not one-off meetings but ongoing processes where diverse actors work toward shared goals. Successful platforms are inclusive, adaptive, and focused on real outcomes. They must manage power imbalances, foster trust, support learning, and balance bottom-up community voices with top-down institutional authority.

The chapter highlights that relationship building and learning are as important as technical solutions. Crises such as droughts or floods often act as catalysts for collaboration, but sustained resilience requires long-term commitment, systems thinking, and institutional change. Participatory tools such as causal loop diagrams and learning exchanges help stakeholders develop a shared understanding of complex climate risks and co-design appropriate responses.

The chapter establishes a conceptual foundation for climate adaptation that is people-centred, system-oriented, and learning-driven. It argues that resilience emerges not from isolated projects, but from locally led, community-based processes supported by strong institutions and partnerships. By integrating climate science, indigenous knowledge, adaptive management, and multistakeholder collaboration, this framework creates the conditions for sustainable and equitable climate resilience in South Africa's most vulnerable communities.

9.1.2.4 Theoretical frameworks

The chapter explains how climate change adaptation is understood, designed, and evaluated through a set of complementary theoretical frameworks that move beyond simple technical solutions. It shows that adaptation is not a single type of intervention but a range of processes and outcomes that reflect different values, priorities, and social goals. Since the Paris Agreement, countries have been required not only to implement adaptation actions but also to demonstrate their effectiveness through national reporting systems such as Nationally Determined Contributions. However, there is no single agreed-upon way to define or measure what "successful adaptation" means, which has led to the development of multiple conceptual approaches.

International research has identified eleven key frames for understanding adaptation effectiveness. These range from economically oriented approaches that seek to minimise costs and maximise benefits, to social

and ethical perspectives that emphasise wellbeing, equity, justice, and transformation. Some approaches focus on reducing vulnerability and increasing adaptive capacity, especially among the most at-risk groups, while others emphasise resilience, defined as the ability of systems to absorb shocks, reorganise, and continue functioning over time. Still others prioritise sustainability, ensuring that adaptation actions remain environmentally, socially, and economically viable across generations. A further set of perspectives draws attention to avoiding maladaptation, recognising that poorly designed interventions can shift risk onto other communities or ecosystems rather than reducing it.

Several frames place strong emphasis on nature and people. Ecosystem-based adaptation recognises that healthy ecosystems underpin human wellbeing and climate resilience, making the protection and restoration of land, water, and biodiversity central to adaptation. Community-based adaptation highlights the importance of co-producing solutions with local people, using participatory processes to ensure that adaptation reflects lived experience, indigenous knowledge, and local priorities. Adaptive governance complements these by focusing on flexible, transparent, and inclusive institutions that can respond to uncertainty, learn from experience, and balance power across scales. At the most ambitious end of the spectrum is transformational adaptation, which argues that incremental change is insufficient and that climate change demands deeper shifts in social, economic, and political systems, especially to address marginalisation and inequality.

These frameworks are not mutually exclusive. Instead, they form a continuum from process-based approaches that focus on participation, learning, and governance, to outcome-based approaches that measure changes in vulnerability, resilience, well-being, and sustainability (Figure 43). Opening adaptation planning to multiple frames helps avoid narrow or technocratic responses and instead supports actions that are better aligned with the global commitment to “leave no one behind.”

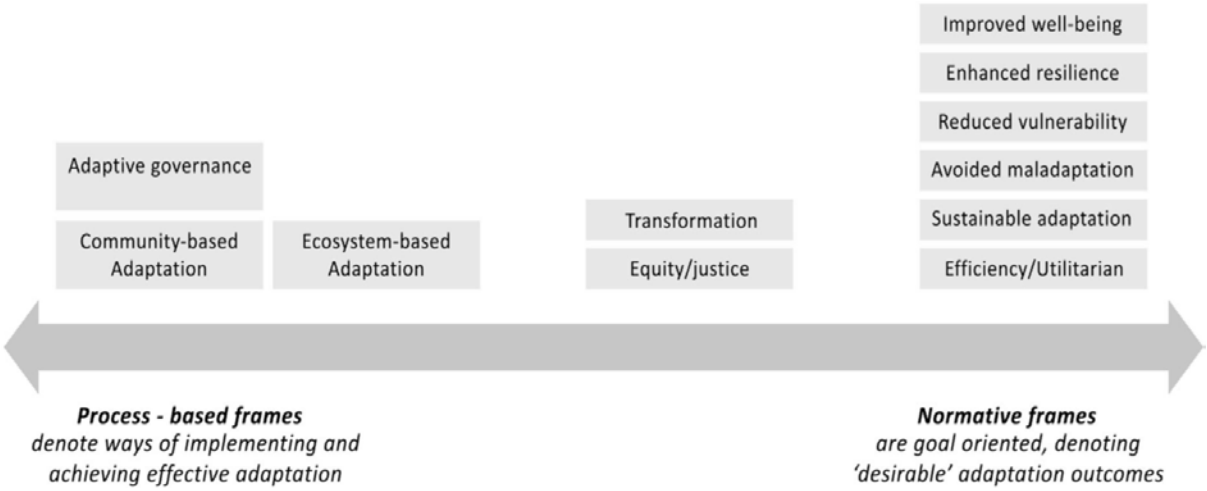


Figure 43: Frames to understand adaptation effectiveness range across a continuum of being process- or outcome-based. Source: (Singh, et al., 2021)

The chapter also situates these theoretical perspectives within South Africa’s policy environment. The Climate Change Act, promulgated in 2024, provides the first legally binding framework for climate adaptation and formalises the responsibility of national, provincial, and municipal governments to assess climate risks and implement adaptation plans. Its principles strongly align with community-based and justice-oriented adaptation, particularly through its commitment to a just transition and to addressing the needs of vulnerable groups such as poor rural households, women, children, and the elderly. The Act requires that adaptation objectives and indicators be integrated into national and local planning instruments, including municipal Integrated Development Plans, ensuring that adaptation is not treated as a separate or optional activity but as part of mainstream development.

South Africa has also established several multistakeholder platforms to support adaptation in practice. The Presidential Climate Commission provides national-level oversight and learning across government, business, labour, and civil society. At district level, Disaster Management Advisory Forums integrate climate information, early warning systems, and risk reduction planning, linking immediate disaster response with longer-term resilience building. In the water sector, Catchment Management Forums and newer catchment partnerships or water funds bring land and water users together to coordinate ecosystem management, protect water

sources, and reduce climate risks. Many of these platforms are supported by research institutions and NGOs, reflecting the importance of collaborative governance in complex climate-water-food systems.

Overall, the chapter presents adaptation as a multi-dimensional and socially embedded process. It argues that effective climate action must combine ecological protection, community participation, institutional learning, and equity-focused governance within coherent policy frameworks. In South Africa, the emerging legal and institutional landscape provides an opportunity to embed these principles in practice, but their success depends on how well national goals, local planning, and multistakeholder platforms are linked to the realities of vulnerable communities on the ground.

9.1.3 Methodology for platform development

9.1.3.1 Building Multistakeholder Platforms for Climate-Resilient Landscapes

Multistakeholder platforms (MSPs) are deliberately built, organised, and sustained to support Community-based Climate Change Adaptation (CbCCA). These platforms are not meetings or projects, but evolving social systems that bring together communities, NGOs, government, business, and researchers to jointly govern landscapes, manage climate risks, and implement solutions.

The rationale for MSPs lies in climate vulnerability. Water insecurity, land degradation, food insecurity, poverty, biodiversity loss, and governance failures are deeply interconnected. No single institution controls all the levers needed to solve these problems. MSPs exist to create spaces where fragmented knowledge, authority and resources can be brought into alignment.

A structured methodology for building such platforms, summarised in Table 17, which presents a cyclical rather than a linear process.

Table 25: Steps in the development of multistakeholder platforms

Step	Description
Initiation	- Concerned individuals, groups, and organisations discuss the potential of setting up a forum that includes relevant role players and stakeholders. - Initial meetings and workshops serve to highlight issues and reasons for such a forum and to pull in the initial core group who are prepared to drive the process, providing time and resources to the effort. - Stakeholder meetings are undertaken to develop interest and motivation and start to build the collaboration for a forum and partnership.
Stakeholder identification and analysis	- A process of mapping all role-players (or the initial set of critical role-players) is undertaken and usually includes people from the affected communities, NGOs, the private sector, local government, and academic institutions. - This could be an iterative process and is refined over time to include an analysis of roles and influence. - Ensure diverse representation and inclusive participation.
Climate risk and needs assessments	- This could consist of conducting vulnerability assessments and resource mapping, gathering both local knowledge (participatory) and using available scientific and desktop information. - It can also take the form of a baseline or initial assessment of the current situation in the area, conducted as a participatory process. - This step also helps to define the boundaries of the forum, both geographically and thematically.
Visioning and goal setting	- Before, or as part of a visioning process, the issues of concern for the participants in the fledgling forum are raised and discussed, so that the resultant vision can clearly incorporate goals for working towards solutions. - This step usually consists of facilitated workshops to develop and establish a shared vision between stakeholders. It helps at this stage to work with experienced facilitators who can also guide the process. - Define clear and measurable objectives of the effort.
Sharing and learning	- This is not a single step but happens throughout in a structured way, decided upon by the participants. This could be through regular workshops where members present their work and thematic questions are explored, and through experiential learning in different contexts through field days, cross visits, and the like. - This step helps participants to understand each other, build rapport and identify initial areas of joint interest and action. - Address barriers to participation for marginalised groups. - Promote leadership roles for women and youth in adaptation planning. - Facilitate peer learning and capacity building. - Develop and share best practices, case studies, and toolkits. - Implement joint projects, pilot initiatives, or policy advocacy efforts. - The role of research organisations and support within the platform is defined, and a broad adaptive research agenda in line with the objectives and inclusive of stakeholders and the communities is outlined. - A formal launch event to create awareness and buy-in for the platform is usually undertaken once the structure and process are well defined. - Set up a knowledge-sharing repository such as a website or document hub.

Step	Description
Structuring the platform	- Explore governance models and set a process for formalisation in motion. This step should not be rushed and can often happen in incremental steps over time, which is preferred over formalising a platform before participants are coherently interacting or committed to the outcomes of the process. - Developing a value proposition that outlines the 'services' of the platform and the outputs or benefits to members/collaborators is a good way to focus such discussions. - Create guiding principles for participation and engagement. - Work through collaborative decision-making processes, outlining how they will occur, who should be involved and how. - Define a core team or secretariat and set up a steering committee for strategic oversight. - Develop clear roles, responsibilities, and decision-making processes for the structure. - When the timing is right, choose a legal or informal structure based on needs (e.g. a coalition, working group or registered entity).
Establishing initial action plans and milestones	- The adaptive planning process is continued, to work on activity sets and implementation plans for the forum, based on the refined vision and objectives. - Collaborative work packages are outlined with deadlines and milestones. - Collaborative planning sessions for designing climate adaptation interventions that can pilot and scale up locally driven solutions are a central component. - Platforms set up in complex environments, with members or participants from a range of sectors, may want to set up working groups or CoPs within the platform to focus the efforts of specific interest groups within the broader platform.
Coordination and communication	- Set up regular meetings, progress reports, and knowledge-sharing sessions. - Create accessible communication channels for all stakeholders, including digital tools for data sharing and ongoing communication, such as newsletters, blogs, and social media, to share updates. - Develop reports, infographics, and videos for broader dissemination. - Engage members through surveys and interactive discussions. - Organise annual conferences, webinars, or high-level summits. - Document processes for adapting the platform model to other communities and areas and share experiences with similar platforms.
Resource mobilisation	- Identify funding opportunities both for the platform itself and for fostering collaborative implementation and partnerships. - Create transparent resource management systems. - Allocate resources for staffing, events, research, and digital infrastructure. - Develop long-term funding strategies (e.g., local revenue generation, grants). - Promote private sector partnerships for co-financing adaptation.
MERL	- Design a monitoring, evaluation, reflection, and learning process, linked to the objectives, outputs, and outcomes. - Define key performance indicators (KPIs) to track progress. - Conduct regular assessments of impact and effectiveness, gather feedback, and continuously refine strategies. - Document lessons learned and best practices for scaling up, highlighting replicable approaches, tools, and strategies.
Sustaining the MSP	- Strengthen partnerships with policymakers and funders. - Ensure alignment with regional and national policies. - Institutionalise the network (e.g., legal registration, long-term funding). - Establish culturally appropriate protocols for resolving disputes. - Expand outreach to new stakeholders and regions. - Foster leadership succession and community ownership.

The process always begins informally. A few concerned organisations or individuals realise they are all working on pieces of the same problem and begin to talk. From there, facilitated meetings expand the group, drawing in communities, government agencies, NGOs, and businesses.

Stakeholder mapping is a critical early step. It is not simply a list of organisations, but an analysis of who has influence, who is excluded, who controls land, water, or funding, and who bears the climate risk. This step ensures that MSPs do not reproduce elite power but actively include women, youth, farmers, traditional authorities, and informal actors.

Climate risk and vulnerability assessments are then used to define the scope of the platform. These combine local knowledge, such as where floods occur, which springs dry up, or which grazing lands are degrading, with scientific data on rainfall, temperature, erosion, and land use. This step also defines the boundaries of the platform: which catchment, which communities, and which climate threats.

Visioning then turns problems into a shared future. Facilitated workshops allow stakeholders to agree on what they want the landscape to look like in 10–20 years. This might include healthy rivers, reliable water supplies, thriving small farms, protected biodiversity, and resilient livelihoods. Without this shared vision, collaboration collapses into competition.

Learning and sharing is not a phase but a continuous function. MSPs deliberately create spaces for cross-visits, farmer exchanges, workshops, and research dialogues so that participants can understand each other's

realities and develop trust. Importantly, this phase also corrects power imbalances by ensuring that community voices and indigenous knowledge are treated as equal to scientific expertise.

Only after this social foundation exists does the platform become structured. Governance models are designed slowly, often beginning with informal steering groups and later evolving into secretariats, working groups or legal entities. This avoids the common mistake of formalising a platform before relationships exist.

Action plans follow, identifying concrete projects—such as alien plant clearing, grazing management, spring protection, or early-warning systems—and assigning responsibilities and milestones. Coordination systems, communication channels, and fundraising strategies then give the platform operational capacity.

At the core of the methodology is the understanding that MSPs must learn and adapt continuously. This is why monitoring, evaluation, reflection, and learning (MERL) is built into the design rather than added later.

9.1.3.2 The Northern Drakensberg Collaborative as a Living Platform

The Northern Drakensberg Collaborative (NDC) provides a real-world example of how the methodology works in practice. It operates in the upper uThukela catchment, a region critical for South Africa's water security but under pressure from erosion, invasive plants, climate variability, and poverty.

The NDC was initiated by a small group of organisations that recognised that fragmented projects were failing to protect the catchment. Farmers, NGOs, researchers, and water users were working independently while degradation accelerated. A collaborative platform was therefore created to align efforts.

Figure 44 shows early convenors walking the landscape together – an important symbol that collaboration begins with a shared understanding of place.

Figure 44: Some of the initial convenors and core team members are exploring and discussing aspects of the landscape (Photo: Kirsten Oliver).

The NDC is governed by four partnership principles: inclusivity, equity, respect, and diversity. These are not symbolic but shape how meetings are run, how leadership is selected, and how decisions are made.

The NDC also developed a clear value proposition, illustrated in Figure 45, which shows the reciprocal relationship between members and the platform. Members receive networking, learning, fundraising, advocacy, and co-implementation opportunities. In return, they must participate, share information, contribute resources, and commit to collective action. This clarity prevents free-riding and strengthens trust.

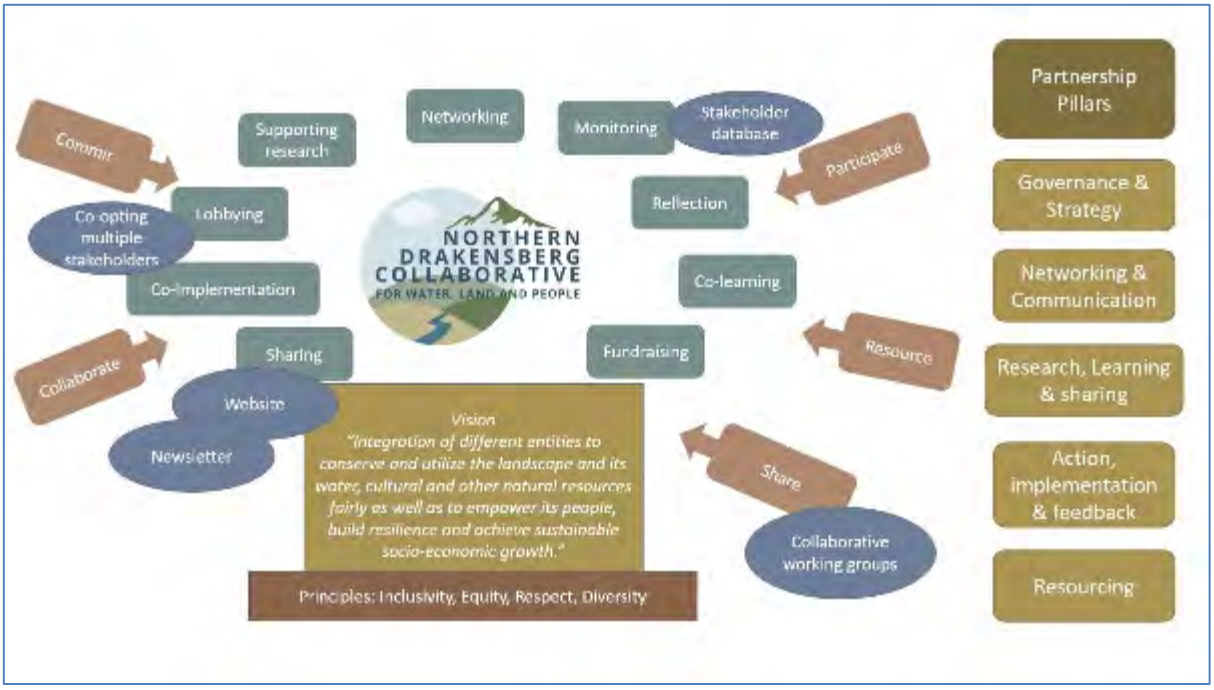


Figure 45: Diagram showing the elements of the Northern Drakensberg Collaborative (NDC).

The NDC relies on five partnership pillars:

1. Governance and strategy
2. Networking & communication
3. Learning & sharing
4. Action, implementation, and feedback
5. Resourcing

Membership is open to any organisation active in the water-livelihoods-biodiversity-climate space in the region, including traditional authorities. The NDC structure is deliberately evolving. Figure 46 shows the shift from an interim convening team to a future structure with a secretariat and multiple CoPs, each focused on themes such as grazing, water, livelihoods, or restoration. This allows both coordination and specialisation.

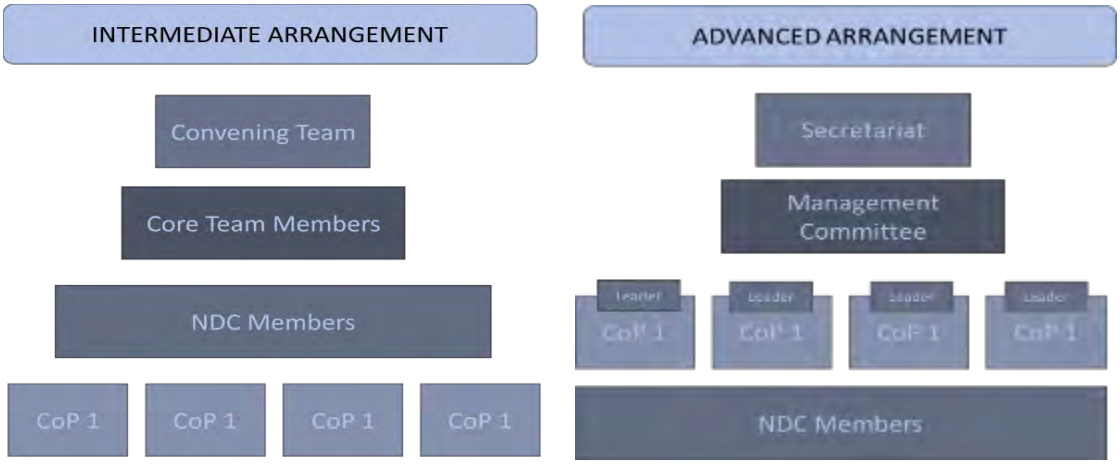


Figure 46: Diagram representing the present and future organisational structure of the NDC.

Monitoring is built into the platform from the start. Figure 44 shows how the NDC tracks both partnership health (relationships, collaboration, diversity) and real-world outcomes (restoration, jobs, water, governance).

This dual focus is critical: strong partnerships without impact are meaningless, and technical projects without collaboration do not last.

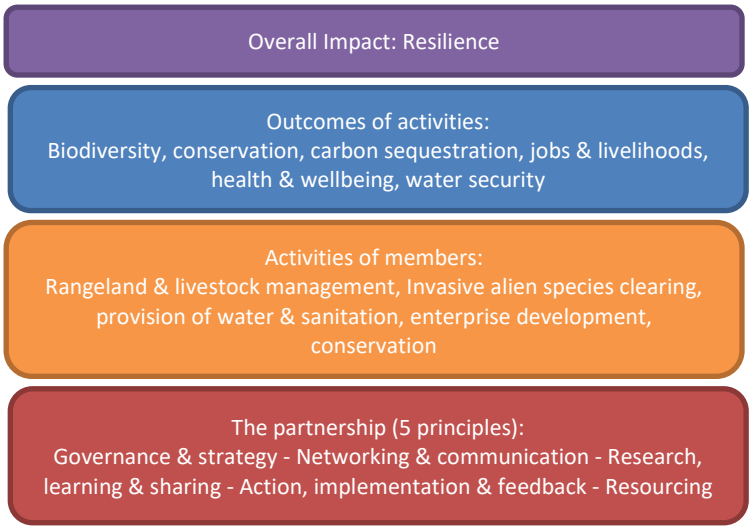


Figure 47: Different elements that require monitoring and evaluation

9.1.3.3 Monitoring, Evaluation, Learning and Resilience Measurement

This section explains how MSPs and community-based adaptation must be evaluated differently from traditional projects. Climate adaptation happens in complex social-ecological systems, not in controlled environments.

Table 18 shows how complexity affects monitoring. Outcomes are shaped by relationships, context, feedback loops, power dynamics, and non-linear change. You cannot simply count boreholes or trees planted; you must understand how behaviour, institutions, and ecosystems are changing together.

Table 26: Features of complex social-ecological systems (SES) and their implications for M&E. Source: Kotschy et al. (unpublished).

Features of complex SES (Preiser et al., 2018)	Implications for monitoring and evaluation
Constituted relationally • Process-dependent interactions on multiple scales result in networks of interactive relations. • Complex systems are defined more by the interactions among their components than by the components themselves.	Multiple activities and role players will be linked to outcomes; it is often difficult to attribute change to the actions of individual stakeholders. Different stakeholders have different interests and criteria for the success of an intervention, and different ways of making sense of past events. Social complexity is often not easy to see or understand from the outside, and simply listing the stakeholders is not sufficient. Since interactions are structured by processes, there is a need to evaluate processes, such as processes of social learning, participation, relationship- and team building, planning, learning, innovation, sharing of information, capacity development, and collaboration.
Radically open • All systems exhibit hierarchy as each is part of a wider system and is made up of sub-systems. Systemic interactions generate effects that have impacts across scales and domains. • How we describe (or identify) systems is a function of our individual points of view.	System boundaries need to be chosen and assumptions clarified. Evaluators may need to go beyond their areas of expertise or to work in transdisciplinary teams to identify and evaluate impacts and influences beyond the chosen system boundary. Need to link across multiple scales, e.g., international, national, local. There are often long-time lags between actions and outcomes or impacts.
Context dependent • The identity and functions of complex systems are defined by the context in which they exist.	Evaluators need to understand context, and often need help to do so, or they need to be embedded in the context themselves. Cause–and–effect mechanisms interact dynamically with the context and so need to be evaluated in a context-sensitive way.
Adaptive • Complex systems have self-organising capacities and can adjust	Ongoing learning is vital to guide the strategic direction of interventions. Monitoring, evaluation, and reporting processes must stimulate as well as adequately capture and share learning.

Features of complex SES (Preiser et al., 2018)	Implications for monitoring and evaluation
their behaviour as a response to changes in their environments.	Evaluation needs to provide timeous and effective feedback to enable appropriate responses and adaptation. Over the life of a programme, the focus and methods of evaluation may need to change. Initially, a more open-ended and developmental approach is required, which progressively becomes more focused while retaining the system gaze. People have multiple motivations for changing their behaviour, e.g., people do not only respond to climate when adapting. Maladaptation is also possible. Transformation is also possible.
Dynamic • Non-linear dynamic processes and feedback loops can dampen or amplify perturbations. Small changes can have significant, cascading effects resulting in multiple modes of system-wide reorganisation or regime shifts.	Shifting baselines and contexts. Stakeholder interests and criteria for success change over time. Power and politics are pervasive within social networks and can exert strong influences on the potential for change in a system. Patterns and effects are inherently uncertain and cannot be accurately predicted. There is a possibility of unintended consequences (positive or negative).
Complex causality • Through the interaction of the individual components, novel qualities and phenomena emerge. Hence, the whole is more than the sum of its parts, and systems cannot be understood based solely on information relating to the individual parts.	It is difficult to link causes and effects, and multiple complicated pathways and mechanisms interact dynamically with the context. Pathways to impact are often non-linear. Multiple outcomes and confounding factors are present. It is difficult to measure non-events or damage avoided. Many outcomes of interest cannot be adequately captured using simple quantitative measures.

South Africa's national adaptation framework defines nine Desired Adaptation Outcomes (DAOs), shown in Table 19, ranging from policy and finance (G1–G6) to reduced vulnerability and food, water, and energy security (G7–G9). These provide the high-level goals that local MSPs should contribute to.

Table 27: South Africa's desired adaptation outcomes.

Inputs to enable effective adaptation	
G1	Robust/integrated policies, programmes, and plans for effective delivery of climate change adaptation, together with monitoring, evaluation, and review over the short, medium, and long term.
G2	Appropriate resources (including current and past financial investments), capacity and processes (human, legal, and regulatory), and support mechanisms (institutional and governance structures) to facilitate climate change adaptation.
G3	Accurate climate information (e.g., historical trend data, seasonal predictions, future projections, and early warning of extreme weather and other climate-related events) provided by existing and new monitoring and forecasting facilities/networks (including their maintenance and enhancement) to inform adaptation planning and disaster risk reduction.
G4	Capacity development, education, and awareness programmes (formal and informal) for climate change adaptation (e.g., informed by adaptation research and with tools to utilise data/outputs).
G5	New and adapted technologies, knowledge, research, and other cost-effective measures (e.g., nature-based solutions) are used in climate change adaptation.
G6	Climate change risks, impacts, and vulnerabilities identified and addressed.
Impacts of adaptation interventions and associated measures	
G7	Systems, infrastructure, communities, and sectors are less vulnerable to climate change impacts (e.g., through the effectiveness of adaptation interventions/response measures).
G8	Non-climate pressures and threats to human and natural systems reduced (particularly where these compound climate change impacts).
G9	Secure food, water, and energy supplies for all citizens (within the context of climate change and sustainable development).

At the community level, resilience must be measured more holistically. The COSA framework and the SHARP+ tool do this by tracking households across multiple dimensions such as food security, water access, income diversity, governance, innovation, and ecosystem management. SHARP+ further allows these indicators to be translated into progress, outcome, and impact measures, shown in Table 20, enabling projects to track not just outputs but long-term resilience.

Table 28: Examples of progress, outcome, and impact indicators that can be based on the SHARP+ questions. Source: Hernandez et al. (2022)

Types of indicators	How?	Example
Progress and output indicators	Monitoring the advancement of project activities through the definition of output indicators based on questions in the tool.	Number of households using sustainable practices to manage land. Number of households using agricultural water management practices. Number of households with access to community-based groups. Number of household income sources, including non-farm options.
Outcome indicators	Short and mid-term effects of project interventions on beneficiaries and community stakeholders can be measured and tracked over time.	Decreased percentage of households using synthetic pesticides. Increased access to community cereal banks. Increased percentage of households with better nutrition, reflected in a higher dietary diversity score.
Impact indicators	Long-term changes resulting from project interventions can be measured through the data collected, especially when projects focus on increasing smallholders' resilience to climate and other shocks.	Increased climate resilience of farmers. Increased food security of rural households. Increased capacity of farmers to respond and adapt to climate shocks promptly. Increased ownership of productive assets, particularly among rural women.

For MSPs themselves, relationship-based evaluation tools are used. Social Network Analysis shows how collaboration grows. The Value Creation Framework tracks how learning turns into better practice. Ripple Effects Mapping captures unexpected benefits. Together, these methods make the invisible dynamics of cooperation measurable.

MDF's own resilience framework integrates agro-ecosystem health with absorptive, adaptive, and transformative capacity, ensuring that both land and people are becoming more climate-resilient.

The chapter closes by emphasising that MERL is not about control but about learning. Platforms must create regular moments for reflection, provide flexible funding for adaptation, and maintain long-term coordination hubs that can steward knowledge and relationships across decades. The chapter shows that climate resilience is built through relationships, learning and adaptive governance. Multistakeholder platforms like the Northern Drakensberg Collaborative provide the social infrastructure that allows science, communities, and institutions to act together in landscapes under climate stress.

9.2 TABLE OF CONTENTS: MULTISTAKEHOLDER PLATFORM DEVELOPMENT MANUAL

CHAPTER 10: SUMMARY OF LEARNINGS AND RECOMMENDATIONS

The key success of this process was the use of a social learning approach (learning groups or CoPs, local facilitators, and individual experimentation) for the promotion and implementation of a range of CRA and W&NRM responses. Participants learnt a lot about analysing climate change impacts and the impact of their activities on their environment. The learning and implementation process improved their decision-making capacity, both individually and jointly.

The key challenges were:

- Lack of positive engagement of the authorities and government officials.
- Local droughts and lack of water provision in these communities.
- Lack of funding support for the smallholder farmers and
- Internal conflicts related to competition for resources and local political instabilities.

In general, however, these communities showed great fortitude in the face of their almost overwhelming problems, and this, more than anything, led to them embracing and working with the concepts and approaches introduced.

Many of the learnings for the farmers themselves are woven into the body of the reports – relating to their farming, their personal motivations and understanding, and their societies. Learning was supported by the strong participatory nature of this process as well as the innovation systems concepts, where learning happens through cycles of practice, observation, and analysis. Local facilitators played an important role in the continued motivation and participation of the learning group participants. Participants felt that learning in the groups vastly outweighed what they could have learned on their own, and they have organised so that they can continue to work together.

Learning within the supporting organisations – MDF and other NGOs such as AWARD, INR, Lima RDF, WIldtrust, K2C, and WWF- was substantial for the fieldworkers and interns involved, where they had to internalise and work with a lot of new information about farming practices and resource management, local conditions and societies, and effective facilitation in a social learning environment.

Some advances were also made through working with other CSOs active in the project areas – stakeholder interaction resulted in collaboration and some sharing of implementation budgets. Cementing the process around climate change and adaptation assisted stakeholders to more clearly understand the need for this cooperation.

The attitudes of stakeholders and staff, slightly more removed from the process, however, (mostly government and municipal structures), were a lot more difficult to assess, where responses ranged from somewhat incredulous to (in most cases) openly sceptical. Many came to this process with preconceived ideas and concepts, which reduced their ability to engage positively. These misunderstandings were underpinned by linear and contradictory thought patterns about what development and resilience mean, and not so much a product of ignorance as a product of our institutional paradigms. There is generally very little respect or empathy for smallholders and their survival imperatives, with most stakeholders engaging in the process from a perspective of personal gain, rather than from a perspective of what would be best for people and the environment they live in.

With respect to the CRA practices identified and tested, it became clear that the greatest impact on resilience lies in the synergies developed through implementing multiple practices within a system perspective, and that designing ways in which complex systems with multiple variables can be tested is a crucial aspect of this work. It is also important to appreciate the inherent limitations of specific practices and the need for local and contextual adjustments in the implementation of CRA. Practices that clearly address a felt need in a particular locality and build on what participants already know and are doing are the most likely to be incorporated into that farming system. Essentially, it is a process of shifting paradigms and building new habits and patterns, which takes a concerted effort over time.

The development of the climate resilience impact measurement methodology and tool is an important innovation that can clearly record and demonstrate the impacts of CbCCA implementation at individual, group, and regional levels. Use of this tool has been able to clearly show the positive reinforcement and synergies of

implementing different practices together, and the substantial improvements in livelihoods and well-being that can be achieved.

In summary, key recommendations are the following:

- Working with learning groups within a social learning process and using farmer-level experimentation to promote and cement the implementation of new ideas was very successful in shifting participants' implementation towards CRA practices. They are a powerful avenue for building motivation and effecting positive change at a local level, and need to be incorporated into CCA implementation approaches more broadly
- Introduction of a suite of options for adaptation is important, to allow participants to experiment with and implement a range of options across soil, water, crop, livestock, and natural resource management. It is the combined effect that allows for the change, rather than any one particular practice
- Social agency is increased and developed within these groups, allowing participants to tackle some of the intractable problems and issues in their villages; notably water access, sharing of information and resources, and rangeland management activities.
- Collaborative activities among participants are an emergent property of this approach, with the added advantages that they are not externally motivated or introduced, and participation is entirely voluntary.
- Implementation of CRA and land management practices provides for a significant improvement in adaptation capacity and resilience, but only if implemented coherently.
- The ongoing learning and mentoring approach can assist staff and other stakeholders involved in this process to internalise best practice options in CRA, as well as facilitation imperatives for such highly participatory processes.
- The CbCCA framework and methodology are coherent and flexible enough to be incorporated into a range of organisational and institutional implementation paradigms and are the first of their kind in South Africa.
- A focus on soil and water conservation, microclimate management (e.g., shade house structures and Conservation Agriculture), soil organic matter, and rainwater harvesting is crucial in underpinning improved productivity and production. Attempting to introduce and expand on conventional agricultural practices in this context is not feasible, given the already extreme conditions and intense competition for dwindling water resources in these types of catchments

We would strongly suggest further support by the WRC for the continued implementation and scaling of this approach and for the exploration of ways to access institutional support and develop appropriate and sufficient financing mechanisms.

Our recommendations for future implementation include:

- Further development of the Climate resilience impact measurement methodology and tool, to provide a fully functional online platform that is widely available.
- More experimentation and resilience assessment of longer-term CRA practice options, such as agroforestry, rangeland management, landscape rehabilitation, and erosion control and
- Design and implementation of specific, tailored programmes development at Local and District Municipal levels, supported by adaptive research and management.

In conclusion, this has been an extremely valuable learning exercise, and lessons learnt are considered widely adaptable to other rural situations and for scaling up interventions in CbCCA. We now have a successful working model for how implementation can go forward. We believe this process is applicable for national implementation and can be used as a basis for implementation by the relevant institutional role players. Participatory analysis and learning around CC impacts and potential adaptive strategies and practices are crucial for allowing local-level agendas in CCA to develop and mature, and need to be included in regional and national CCA implementation strategies and processes

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APPENDICES

APPENDIX 1: CAPACITY BUILDING

Postgraduate studies

Two post-graduate studies have been supported through this research process. Details of these studies are provided in the table below.

Table 29: Details of post-graduate studies supported.

Project Leader Full Names and Institution:	Erna Kruger, Mahlathini Development Foundation	Erna Kruger, Mahlathini Development Foundation
WRC Project Number and Title:	C2022/2023-00747	C2022/2023-00747
Student Name(s):	Temakholo Mathebula	Nkazimulo Jacob Dlamini
Student Number:	4481656	204009100
Student Institution of Study:	UWC-PLAAS	University of KwaZulu-Natal (UKZN)
Student qualification Level:	M Phil	D Phil
Student qualification name:	Agriculture	Adult Education
Year of study in the Course:	2nd	2nd
Anticipated date of Graduation:	April 2026	April 2026
Dissertation Title/Study focus:	The factors leading to the maladaptation of climate change interventions in smallholder farming systems in Ozwathini, KwaZulu-Natal	Learning values through participation in savings groups in KwaZulu-Natal: An Afrocentric case study
Main objectives/research questions:	This study aims to advance insight into how unequal distribution of power and political processes undermines the ability of smallholder farmers to cope with climate change. The study also seeks to provide a more nuanced understanding of the differentiated impacts of climate change across gender, class, generational classes, and ethnicity. Lastly, the research aims to investigate the factors that lead to the maladaptation of climate change interventions in smallholder farming systems.	This PhD study aims to explore the intricate relationship between participation in savings groups and the dual processes of value learning and knowledge creation.
Short summary of research project	The research approach combined qualitative and quantitative methods to develop a comprehensive understanding of climate change adaptation and the socio-political processes affecting communities	With a particular focus on how individuals acquire these values and navigate potential tensions between Eurocentric and Afrocentric worldviews, the research illuminates how participants, as invaluable knowledge holders, engage in dynamic knowledge creation – from implicit understandings to explicit information and tacit insights – which they subsequently use in their daily lives and specifically when operating their groups.
How does your research support the wider WRC project you are linked to? (1 paragraph)	An analysis of factors influencing climate adaptation within a research and dissemination process focused on community-based climate adaptation (CbCCA). Included in the analysis of CbCCA case studies and part of the final manuals and guidelines on implementation of CbCCA developed through the research process.	The core inquiry seeks to understand precisely how these value tensions are managed within savings groups, further examining the specific values learned, the learning interventions employed by NGOs, and the overall processes of learning and knowledge generation. We would understand how savings groups can be used to finance small-scale enterprises for smallholder farmers.
Key Milestones	May 2025: Completion of field work. Nov 2024: Finalisation of research proposal and desktop review March 2025: Finalisation of Research methodology Sept 2025: Initial analysis of results March 2026: Submission of draft completed thesis	Jan – Oct 2025: Data collection: Observations, Focus Group Discussions, interviews, final learning workshops, and data analysis. Nov 2025 to Jan 2026: Continuation of data analysis and write-up Feb – Apr 2026: Submission of first draft of thesis, attend to corrections, and final submission in April

Community level and organisational training and capacity building

These two aspects have been exhaustive and ongoing for both staff and communities, consisting primarily of non-accredited one-day trainings and short courses.

Table 30: Capacity building for communities and staff

Themes	Communities	Staff
CRA	Nutrition, seed saving, organic CA, fodder production and management, garden layout and design, soil and water management, soil fertility management, trench beds, crop diversification, natural pest and disease control, value adding, Management of mycotoxins in field crops, poultry production, drip irrigation, greywater management, fire management, Spring protection	Veld assessment, poultry production, fodder nutrient analysis, CA, social-ecological mapping, small business development, wetland rehabilitation and management, rangeland management
Organisational capacity development	Committee training, constitutions, conservation agreements, well-being, and gender-based violence	First aid, project management, financial management, gender mainstreaming, safeguarding, climate resilience impact measurement,

APPENDIX 2: KNOWLEDGE CREATION REPORT

The contribution to new knowledge creation through this research process is summarised in the table below.

Table 31: New knowledge creation report

ITEMS	DESCRIPTION
New knowledge created	1. Development and dissemination of a bespoke model for CbCCA across multiple stakeholders, including communities, civil society, and government. 2. Development of evidence-based indicators for monitoring resilience impact. 3. Development and promotion of new models and processes for community ownership of water access 4. Provision of guidelines and handbooks for programming in local food systems development and effective smallholder microfinance and enterprise development support.
Gaps to be filled	Design and implementation of an overarching framework for CbCCA in South Africa
Products	1. Desktop review of South African policy, implementation frameworks, and stakeholder platforms for CCA 2. Monitoring tool for multi-stakeholder implementation platforms in CCA 3. Guidelines for the implementation of local food systems and marketing strategies 4. Handbook for Implementation of Smallholder Financial Services 5. Refined CbCCA decision support framework with updated databases and CRA practices 6. Case studies: CbCCA implementation and community ownership for water access and management 7. Manual for the implementation of successful multi-stakeholder platforms in CbCCA
Innovation	The first coherent process of this kind focused on smallholder farmers in South Africa
Users and beneficiaries	Multiple stakeholders (Government, Academic Institutions, NGOs, CSOs, and community-based CoPs)
Need	There is a dire need for coherent implementation of CC adaptation strategies and programs, whether this has been clearly articulated or not. South Africa has excellent policy documents and processes, but lacks coherent implementation approaches.