

Climate Resilient Agriculture in mixed smallholder farming systems

WWF- Green Trust: Final Report: Milestone 8
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Submitted by Mahlathini Development Foundation

By Erna Kruger, Mazwi Dlamini, Michael Malinga and Temakholo Mathebula with support from interns Lungelo Buthelezi, Hlengiwe Hlongwane and Ayanda Madlala

EXECUTIVE SUMMARY

The two main outcomes for the project can be summarized as:

- Food and nutrition security at household level for poor, rural homesteads with enough farming income to sustainably maintain farming activities in the short term and
- Development of social agency for community led local economic development and social safety nets and improvement of the natural resource base.

These outcomes have been achieved by working intensively with Climate Resilient Agriculture (CRA) learning groups in 18 villages across KwaZulu Natal (Bergville, Midlands and Southern KZN) and the Eastern Cape (Matatiele). Improvements have been implemented and monitored for 378 participants.

In each CRA learning group participants undertook a climate change assessment, and prioritized adaptive measures and practices undertaken by each individual in the group. CRA practices have included for example Conservation Agriculture (intercropping, crop rotation, inclusion of cover and fodder crops), livestock integration (poultry micro businesses, fodder production, winter fodder supplementation and calf rearing) and agroecological homestead vegetable production (micro tunnels, trench beds, rainwater harvesting, mulching, grey water management, composting, mixed cropping, crop diversification, liquid manures, natural pest and disease control and seed saving). Seasonal reviews and joint learning activities reinforced cyclical learning and adaptation.

The CRA learning groups also formed the basis for improvement of social agency and governance for joint discussion, analysis and collaborative action, primarily around marketing and water access, but also in resource conservation activities. Eight (8) of the groups have formed formal marketing committees and structures for local marketing, 3 have formed water committees and undertaken community owned and managed water schemes in their villages, 5 have set up farmers' associations for calf rearing and livestock management and 2 have undertaken resource conservation activities linked to youth employment in their villages. For the remaining groups, collaboration has been strengthened in these areas, but not to the extent of initiating formal structures and initiatives.

Through expansion and intensification of production and productivity, participating smallholders have increased both household food availability and incomes. The total value of production averages around R3 060/ per household per month. This equates to a 68% increase in production and incomes as a result of this intervention. Around 80% of participants still produce for household consumption first and sale of surplus. This has meant that farmgate sales and local marketing stalls are the most appropriate marketing strategies, as these can provide flexibility for sale of various quantities and types of produce. Participants have increased their crop diversity by roughly 10 crops per participant and each has also included around 10 new CRA practices into their farming system.

Membership of the Village Savings and Loan Associations (VSLA) has increased to 510 participants, including the initiation of 6 new VSLAs and on Bulk Loan Fund association. The overall annual value of these VSLAs is roughly R 1 117 420, and an individualised value of around R3 342 per annum. Participants use these savings and small loans for household consumption smoothing, buying of household items, education, production inputs and small businesses. These VSLAs provide a very strong element of financial sustainability to participants in a highly vulnerable environment.

Mahlathini staff have been involved in a range of multistakeholder platforms and networks in the 2 years of project implementation. We have also been involved in participatory research activities, exchanges, conferences, webinars and open days. The intention is always to share our work as widely as possible, to learn from others and to provide some influence towards broader implementation of community-based adaptation and innovative and responsible development models for the rural poor of South Africa.

CONTENTS

Executive summary.....	2
Contents.....	3
Narrative report.....	4
1 Outcomes per objective.....	4
1.1 Progress overview.....	5
1. Conservation Agriculture (2 cycles of implementation).....	6
2.1.....	7
2. Intensive homestead food production: Gardens and small livestock.....	8
3. Resilience snapshots.....	9
4. Village Savings and Loan Associations (VSLAs).....	18
5. Local incomes and marketing.....	21
6. Strengthening of Innovation platforms and networks.....	23
3 Gaps and constraints.....	26
7. Publications.....	24
2 Comment on financial report.....	25
Notes on expenditure.....	25
3 Financial report.....	27

NARRATIVE REPORT

PROJECT DETAILS

Project No and Title	GT06177_ID315_ Climate Resilient Agriculture in mixed smallholder farming systems allows for sustainable food and nutrition security and local incomes for the rural poor in the lower Drakensberg foothills of KZN and the Eastern Cape.
Date of approval	6 th October 2020
Start and end date	1 st October 2020-30 th August 2022
Project value	R3 000 000
Contractor's name	Mahlathini Development Foundation
Manager's name and contact details	Erna Kruger Cell:0828732289 Email: info@mahlathini.org
Project objectives	Increased productivity and resilience in the mixed smallholder farming system through implementation of a basket of Climate Resilient Agriculture practices: <ol style="list-style-type: none"> 1. Work with existing CCA learning groups to scale up production in the short term within the confines of the COVID-19 pandemic 2. Support a range of intensified food production activities; vegetable production, field cropping and livestock integration 3. Improve social agency for value chain support (VSLAs', bulk buying, local farmer centres and local marketing initiatives)
Project outcomes	<p><i>Outcome 1 - Food and nutrition security at household level for poor, rural homesteads with enough farming income to sustainably maintain farming activities in the short term</i></p> <ol style="list-style-type: none"> 1. Activity 1 - Learning group review and planning sessions to prioritize each participant's most appropriate basket of CRA practices to be implemented, within the present confined of the COVID-19 pandemic and climate change 2. Activity 2 - Prioritize a basket of appropriate adaptive practices for the individuals and groups involved within different thematic categories: Crops, livestock, water, soil and natural resources 3. Activity 3 - Provide learning and implementation support for the CRA* practices using a Participatory Innovation Development (PID) approach <p><i>Outcome 2 - Development of social agency for community led local economic development and social safety net Improvement of the natural resource base</i></p> <ol style="list-style-type: none"> 4. Activity 1 - Build social and economic capital within each of the learning groups using approaches such as Village savings and loans associations (VSLAs), farmer centres, small business development and local marketing initiatives 5. Activity 2 - Set up a participatory monitoring and evaluation (PM&E) system for monitoring and assessing the impact of the CSA practices on livelihoods and resilience. 6. Activity 3 - Use an iterative approach of farmer level experimentation and social learning to build local adaptation and innovation capacity

1 OUTCOMES PER OBJECTIVE

The final three months of this project have been focused on finalisation of the conservation agriculture process for this year including yield measurements. The two local marketing processes in Bergville and Ozwathini have continued with monthly markets. In Matatiele the gardening training and micro tunnel implementation process has been finalised and workshops conducted on marketing explorations and a last round of support for layers and feed has been provided.

The main emphasis has been on the final evaluation process, which consists of in-depth individual interviews: the resilience snapshots. Monitoring case studies have been compiled for a selection of participants.

Table 1: Progress against specific outcomes and activities for the period mid-June to end August 2022

Outcome	Activities	Progress (Milestone 8)
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Note: For KZN cropping fields are on average 0,25ha/participant. For EC fields are on average 0,01ha or smaller.
 Note: Gardens are small and average 0,025ha per participant.

The proposed number of participants for the programme is 135 per annum (55 from KZN and 80 from EC), thus 270 in total over the 2 years of implementation. At the end of the project there were 378 participants in the programme, 234 from KZN and 144 from the EC. In KZN the learning groups are well developed while in the EC, the learning groups are new and in the process of being introduced to the various aspects of CRA and working in learning groups.

For all the activities (poultry, seedlings, CA and fodder supplementation) farmers were supported with a proportion of the start-up inputs and have contributed to their own inputs thereafter. MDF assisted in procurement and delivery. Due to the combined effects of COVID-19 and the social unrest, many agricultural inputs are still in short supply and are not easy to get hold of. This includes day old chicks, point of lay hens, maize seed, fertilizer and seedlings. Prices have escalated dramatically.

1. Conservation Agriculture (2 cycles of implementation)

Implementation of conservation agriculture in the EC (Matatiele) has been disappointing, despite learning and input support from the facilitation team. A combination of very bad soil conditions, extreme weather events and lack of financial and labour support from participants in field cropping, conspired to produce very little implementation and improvement.

In KZN, CA implementation is a lot more advanced, in part due to support for a CA- innovation programme by the Maize Trust and in part due to a much more focused interest in field cropping by participants. Farmer level trials have focused on experimentation with a number of aspects of the CA cropping system, including inter cropping with legumes, crop rotation, use of different maize varieties, planting of cover crops and livestock fodder species and winter fodder supplementation.

In this participatory research process, there is a focus on both qualitative and quantitative measurement of a range of indicators by the farmer and facilitator teams, to enable evidence based learning and adaptive management. A brief summary of a selection of these indicators is provided below.

Rainfall measurements

A selection of participants in KZN have rain gauges and keep records of their rainfall. This is compared with information from weather stations through a collaboration with SAEON (South African Environmental Observation Network). A summary of monthly average rainfall (from 3 weather stations around Bergville) is provided below as an indication.

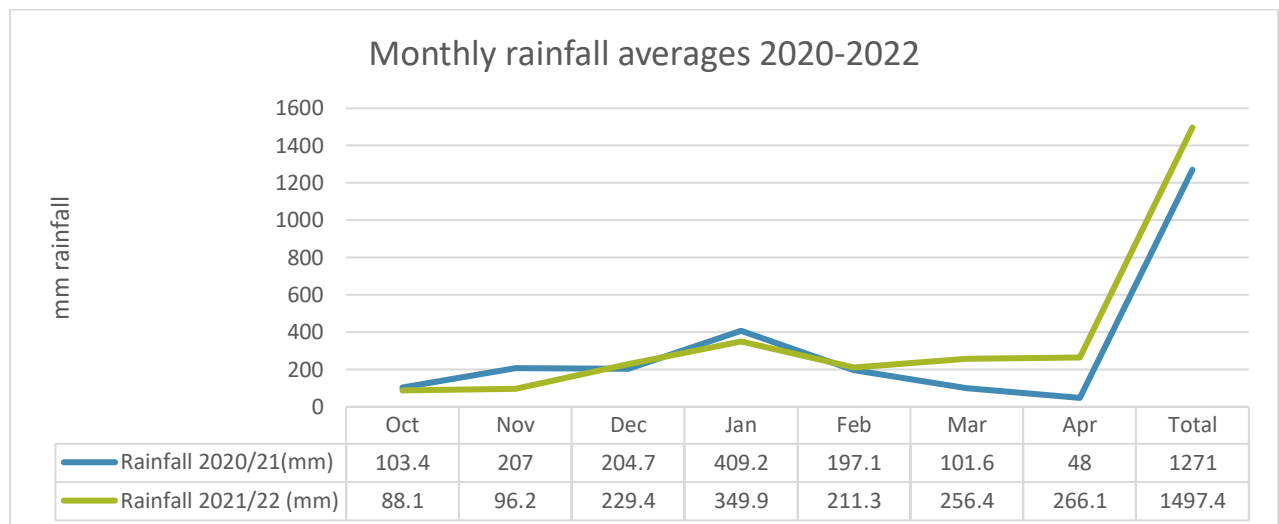


Figure 1: Monthly rainfall averages for 2020-2022

The trend, which is similar in all implementation areas for this project is that early summer rains are delayed and low and that late season rain is higher than expected. For the 2021-/22 season the late season rainfall was consistently very high and had a number of negative impacts on dryland field cropping; including overgrowth of weeds, delayed planting of late season crops, excessive runoff, increased fungal infection load and reduced yields. For both seasons the cumulative seasonal rainfall was more than double the long-term Bergville average, which is around 650mm/annum.

Runoff

This is measured for a small group of participants, where runoff pans are installed in their fields. Again, the farmers keep these records. An example for Bergville is provided below.

Table 2: Runoff percentages across two seasons for CA trial and control plots.

	rainfall (mm)	runoff CA plot (L)	runoff control plot (L)
Bergville (6 participants, 4 villages)			
Sum	1277	76,7	146,1
% Rainfall conversion (2021)		6%	11%
% Rainfall conversion (2022)		4%	5%
% Rainfall conversion (average)		5%	8%

These results indicate that the runoff in the CA trial plots for farmers is almost 50% lower than the runoff in the control plots, although this percentage was lower for the 2021/22 season with the very high late season rains.

Figure 2: Installation of runoff pans in control and CA trial plots, respectively.

This translates to around 55l/m² of water saved in the CA system and provides a volumetric water benefit of 550 000l/ha.



Water productivity (WP)

WP has been calculated for maize, both in single and intercropped plots. The intention is to explore the WP of maize planted under different cropping options for farmer participants who have been implementing CA for between 3 and 8 years.

The aim was to ascertain whether the different cropping options within the CA system provide for different water productivity outcomes and to compare CA with conventional tillage in terms of mono-cropped maize.

For the 2020/21 and 2021/22 seasons the WP was calculated for the different CA cropping options, as shown in the table below, for 3 implementation areas in KZN.

Table 3: WP calculated for KZN for different CA cropping options 2020/21 (n=11) and 2021/22(n=8)

WP (kg/m ³) 2020- 2022	Farmer name	M 21	M 22	M+B 21	M+B 22	M+CP 21	M+Pk 22	M-CA Control 21	M-CA control 22	M-Conv Control
Bergville	B Hlatshwayo (strip)	2,74						0,96		
	Nelisiwe Msele	2,57	3,96	2,32	2,04	2,1	2,43	1,01	0,98	
	Ntombakhe Zikode (Strip)	1,91			3,34		3,55	0,72	2,07	
	Phumelele Hlongwane	4,65	5,37	4,45	6,42	4,31	4,1	1,16	2,19	
	Sibongile Mpulo	3,27	3,73	3,04	4,02	2,12		1,44	2,72	
SKZN	Cosmos Xaba (strip)	1,87	1,22		1,47			1,19	0,49	
	Letta Ngubo		0,89	3,52				2,08	0,76	
	Mandla Mkhize			2,15				1		
	Thandiwe Hadebe			2,55				0,92		
Midlands	Mrs Xulu		0,95	1,92	1,38			0,2	1,35	0,98
	Nomusa Shandu	0,44		1,01						0,53
	Babhekile Nene	1,87	2,35	0,85	2,84			0,63	0,79	
	Rita Ngobese			3,14				0,85		
Overall averages		2,28	2,64	2,5	3,07	2,84	3,36	1,01	1,42	0,75

From the above table the following is evident:

- WP values for the 2021/22 cropping season are higher for all treatments than in the 2020/21 season.
- The same trends are seen for both seasons where:
 - o **WP for CA plots are substantially higher than WP for conventionally tilled plots**
 - o WP for the **CA control plots, which have been repeatedly mono-cropped to maize are substantially lower** (1,01 and 1,42 kg/m³ respectively for 2020/21 and 2021/22) **than CA plots planted to mono-cropped maize in a multi-crop rotation** (2,28 and 2,64 kg/m³ respectively for 2020/21 and 2021/22)
 - o **WP for inter-cropped CA plots** (maize plus beans (M+B), or cowpeas (M+CP), or pumpkins (M+Pk)) **is substantially higher than mono-cropped CA plots**

There are clearly very distinct water productivity benefits through CA implementation. This translates to a saving of 1 730l/kg of maize produced under and intercropped CA system and allows for a volumetric water benefit of around 8 million l/ha (assuming an average yield of 4,6 t/ha).

Dryland crop yields

Yield measurements were undertaken for maize and beans in the 3 implementation areas in KZN (Bergville, SKZN and Midlands) for both seasons of implementation. The table below provides averaged data.

Table 4: Yield averages for dryland maize and beans for 2021 (n=152) and 2022(n=47) across KZN.

Maize and bean yields (CA trial plots)	Bergville		SKZN		Midlands	
	2021	2022	2021	2022	2021	2022
No. of villages	4	4	5	4	9	4
No. of trial participants	28	18	37	16	87	13
Area planted (trials) (ha)	3,5	2,4	1,25	0,8	4,3	1,3
Average yield maize (t/ha)	6,3	4,6	3,4	1,29	2,6	3,7
Min. and max. maize yield (t/ha)	1,6-14,8	0,3-13,6	0,5-10,2	0,3-2,7	0,3-5,8	1,0-6,3
Average trial quantity of maize (kg)	390	143	110,5	66	160	184
Rand replacement value of maize meal	R3 120	R1 516	R884	R593	R1 280	R1 652
Average yield of beans (t/ha)	0,88	0,44	1,16	0,37	1,1	0,38

The above table indicates a reduction in maize yields for Bergville and SKZN between 2021/22 and 2021/22 and an increase for the Midlands. The heavy late season rainfall had obvious negative effects for two of the regions and a positive impact for the Midlands. The ranges of yield for the different participants are quite extreme from 0,3t/ha – 14,8t/ha. This is not uncommon among smallholder farmers where quality of implementation is very varied and where specific soil conditions for different individual's fields can be extreme as well.

The bean yields for both seasons are quite low, but for 2021-22 are very low. Late season rains affected legume yields substantially. Yields for the CA trials are generally substantially higher than the CA control and conventional control plots. The small table below for 2021/22 is indicative.

Table 5: Average CA control and CA trial yields for KZN:2021-22

Area (2021/22)	CA control (M), yield (t/ha)	CA trial (M) yield (t/ha)
Bergville	2,87	4,91
SKZN	0,86	1,26
Midlands	3,95	3,83

2. Intensive homestead food production: Gardens and small livestock

As with the field cropping these activities were a combination of learning, mentoring and implementation with an initial subsidy for input support.

Learning workshops undertaken include:

- CCA introduction (CC impacts, adaptive strategies, prioritization of a basket of CRA practices for each individual and learning group)
- Greywater management and tower gardens
- Bed design: trench beds and eco-circles

- Soil fertility: Composting and liquid manures
- Tunnel installation and drip kit construction
- Mixed cropping and Natural pest and disease control
- Poultry production and management and
- Seasonal review and planning workshops.

Interventions in gardening took a number of forms including improved agroecological production practices, construction of deep dug organic beds, tower gardens and micro tunnels with drip irrigation. A total of 114 tunnels have been installed and are now operational across 14 villages. In Bergville and Matatiele participants have been the most enthusiastic in this undertaking at 42 and 45 tunnels respectively. It relies on a large initial labour and resource input from farmers as they are required to dig and pack their 3x5m² trench beds before tunnels are constructed. These are also the two areas with the most extreme weather conditions where this extra labour is well rewarded in production increases. Detailed reporting on tunnel implementation and gardening has been provided in previous milestone reports

For the micro poultry production units, the team and farmers have needed to rely heavily on commercially available birds, feed and medication. Improvements have come primarily from supplementing feed with greens, housing and sanitation and more careful rationing of feed for the poultry. Poultry production was very popular, being seen as a quick turn over activity for income generation. Ninety-eight (98) small broiler units have been supported as well as 50 egg production units. Participants have managed to make a reasonable, if not continuous income from these poultry units and the hopes for quick profits have not been realized, as poultry production using commercial inputs is a very fine balance in terms of costs and outputs. Detailed monitoring was provided in earlier milestone reports.



Figure 3: Above Left to Right: Examples of a tower garden (greywater management) a tunnel and a small broiler unit.

3. Resilience snapshots

Monitoring and evaluation for improvement of livelihoods and incomes through the CRA implementation has been undertaken. This was the main activity for the last two months of this intervention, along with finalization of the last tunnels and poultry orders.

An intensive impact survey was conducted with around 40% of participants from each of the areas (Bergville, Midlands, SKZN and EC_Matatiele), using the Resilience Snapshot methodology, process and questionnaire developed for this purpose. Indicators for these snapshots were carefully developed and pre-tested, to show changes and impact in a range of resilience related criteria. Below the summary tables for the 2 areas (KZN and EC) are presented, with short discussions

KwaZulu Natal

In KZN participants were interviewed in the Bergville (n=21), Midlands (n=15 and SKZN (n=9) sites, proportionally according to the number of participants in each site. Each site is in a significantly different agroecological region and in terms of proximity to large urban centres, which are the two main factors for differences in production and productivity between these sites. Local production habits also play a part, as does attitudes towards change and new ideas. The table below summarizes the changes across the three sites.

Table 6: Climate resilience snapshots for 45 participants from KZN: August 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: 93m ² - 234m ² (253%)	Gardening: 1 217m ² - 1664m ² (36%)	Gardening: 25m ² - 100m ² (400%)	Sizes of gardens have increased, substantially in Bergville and SKZN where many participants were not gardening before. In the Midlands most participants already have reasonably sized gardens
	Field cropping: 2 460m ² - 6 175m ² (251%)	Field cropping: 5 163m ² - 6 270m ² (21%)	Field cropping: 1 666m ² - 1 044m ² (-62)	Dryland cropping has increased substantially since introduction of CA and includes fodder production and cover crops in Bergville. Field sizes range from 500-28 0000m ² . Field cropping has however decreased in SKZN, due to adverse weather conditions and economic pressures and have 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: -	Fruit and other trees: -	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/participant (46%)	Livestock: >5 layers/participant (5%)	More poultry kept (broilers and layers) for marketing. Most families' livestock have decreased substantially due to theft, the recent floods and household use.
Increased farming activities	2	2	2	A number of participants have re-initiated certain farming activities: gardening and/or field cropping activities as well as poultry production (broilers/eggs).
Increased season	Yes	Yes	Yes	For field cropping - autumn and winter options and gardening throughout the year. This is a measure for improved continuity and production.
Increased crop diversity	Crops: 24 new crops ~ 7 per participant	Crops: 20 new crops ~ 9 per participant	Crops: 19 new crops ~ 6 per participant	<i>Number of new crops planted in each area and per farmer:</i> New crops 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 (Ave 11 per participant)	Practices: 21 new practices (Ave 10 per participant)	Practices: 15 new practices (Ave 8 per participant)	<i>Number of new CRA practices implemented per farmer:</i> These include 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 and RWH drums.
Increased productivity	Gardening > 73kg /season/per farmer	Gardening > 410 kg /season/per farmer	Gardening > 17 kg /season/per farmer	<i>Increase in Kgs of vegetables produced per season:</i> Based on increase in yields, mainly from tunnels and trench beds for gardening, for a range of vegetables and herbs.
	Field cropping: > 450kg /season/farmer	Field cropping: > 888 kg /season/farmer	Field cropping: > 181 kg /season/farmer	<i>Increase in Kgs of field crops produced per season:</i> Relates to switching to CA and increase in field size, for a range of field crops - mainly maize, beans and potatoes
	Livestock: >2/year/farmer	Livestock: >15 chickens/year/farmer	Livestock: >21 chickens/year/farmer	<i>Increase number of livestock:</i> For Bergville the number relates to cattle, For Midlands both layers and broilers and for SKZN to layers.
Increased water use efficiency	6	7	5	<i>Access, RWH, water holding capacity and irrigation efficiency rated. Scale: 0= same or worse than before; 1= somewhat better than before, 2= much better than before x 4 criteria (values of 0 to 8):</i> The ratings indicate good improvements in RWH, water holding and irrigation efficiency and some improvement in access.
Increased income	R741 /month/farmer Range: R240- R2 000	R3 641 /month/farmer Range: R800- R7 320	R1 021 /month/farmer Rang: R200- R1 500	<i>Increase in average monthly income (Rands):</i> This is primarily through local marketing and small businesses. A number of participants have lost employment and grant incomes and replaced these with farming. Around 10% of participants have not improved their incomes
Increased household food provisioning	Vegetables; 18kg/week	Vegetables; 27kg/week	Vegetables; 6kg/week	<i>Food produced (overall Kgs per week) and consumed in the household:</i> For both Bergville and the Midlands these figures indicate food secure participants, while for SKZN the self-produced food is roughly 30% of that required for a household
	Dryland crops (maize, legumes, sweet potatoes); 23kg/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: 2kg eggs/month	

Increased food security	Average: 3 food types/2x per week	Average: 5 food types/ 3x per week	Average: 3 food types/ 2x per week	<i>No of food types/ no of times/week:</i> This is a measure of improved dietary diversity and indicates both improved access and changes in food habits. This largest diversity is found for the more peri-urban communities in the Midlands
Increased livelihood diversity options	1	1	1	<i>Average increase in livelihood sources:</i> Social grants, remittances, farming incomes, small business income, employment. Increase in no of livelihoods options used. Primarily from farming and small business income
Increased savings	Average: R152/month/farmer	Average: R354/month/farmer	Average: R280/month/farmer	<i>Average increase in savings (Rands):</i> 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	<i>Average number of local organisations farmers belong to:</i> 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
Increased informed decision making	2	2	2	<i>Average number of sources of information:</i> Own experience, local facilitators, other farmers/community members, facilitators, extension officers, radio, extension officers.
Positive mindsets	3	3	3	<i>A qualitative rating of wellbeing for each participant:</i> SCALE: 0=less positive about the future; 1=the same; 2=more positive about the future; 3=much more positive. More to much more positive about the future: Much improved household food security and food availability.

In Bergville participants doubled the sizes of their gardens and field cropping areas and increased poultry and fruit production. Livestock production decreased by around 33%, mainly due to substantially increased theft in the area, but also due to use for Lobola, ceremonies and household consumption. Twenty-four (24) new crops have been introduced and are being grown in the area, as well as 24 new CRA practices. Productivity has increased and farmers are producing on average 73kg more of vegetables per season and around 450kg of field crops more. Their food security has been improved and their incomes by an average of R741/month, from farmgate and market stall sales. Savings have increased by R152/month per participant. Participants are now involved in at least 3 more social organisations including the learning groups, savings groups, farmers associations and water and marketing committees. They have improved their decision making, now working with local facilitators, DALRRD extension officers, and MDF staff. In summary their mindsets and outlook on their futures are much more positive, with much improved household food security and food availability.



Cover cropping	3	3	3	3	3	3	3	3	3=high positive change
Worm composting	3	2	3	3	3	3	3	3	
Aquaculture	0	-1	3	3	2	3	3	3	
Hydroponics	0	-1	3	3	-1	0	3	2	
Hay harvesting	2	3	3	2	0	3	3	3	



Figure 6: Left: The local market stall set up at the Bamshela Taxi rank for the Midlands marketing group. Note the packaged, eggs, beans and potatoes, alongside cabbages, Chinese cabbage, carrots and spinach. This group manages their own market process, collection, set up and sales. Right: An example of an online and printed poster produced for the veggie combos sold through social media in Pietermaritzburg.



Figure 7: Above Left: Ntombizodwa Hlope's layers and calves being hand reared by Martina Xulu (Ozwothini May 2022)

In SKZN, improvement in productivity has been hampered by relative isolation of the villages, due to broken hilly topography of the area, lack of access to urban centres and high climate variability. Many participants have started gardening again, albeit on small patches between 25-100m², their field cropping areas have contracted by 62%, due to repeated weather-related crop losses and deteriorating soils and increase in livestock has been limited to an increase in the number of layers (~5 per participant farmer). They have suffered losses in livestock numbers (cattle and goats) due to theft and flooding. Nineteen (19) new crops have been introduced and are being grown in the area, as well as 15 new CRA practices. These are lower than in the other two KZN sites and relates to a higher reticence to change in this area., Productivity has increased, and farmers are producing on average 17kg more of vegetables per season and around 181kg of field crops more. Again, this is lower than the other two sites and provides for a 30% increase in food security here, compared to around 90%. Incomes have increased

by an average of R1 021/month, primarily from farmgate sales. It has not been possible to establish joint local marketing actions in this region. Savings have increased by R280/month per participant. Participants only have the CRA learning groups as a new organisational structure in these villages. Despite these lower levels of success in this site participants' mindsets



and outlook on their futures are much more positive, with much improved household food security and food availability.

Figure 8: Above Left : Layers' unit for Mr Mandal Mkhize in Ngongonini and Above Right: Letta Ngubo's CA field with summer cover crops and maize in Spring Valley, SKZN (February 2022)

Eastern Cape-Matatiele

Villages in this region are sprawled along the escarpment leading up into Lesotho and weather conditions are quite extreme at the best of times. Winters are cold with severe frost and sometimes snow. Summers are cool to hot and rainfall is unreliable, but often comes in the form of severe storms that include hail. In addition, soils in the region are poor with low levels of organic matter, high levels of sand and high levels of compaction. Severe imitations in access to water persist in the area and water for irrigation is virtually entirely lacking

Although there are vast areas of abandoned fields, intervening in dryland cropping would need a very focused and intensive effort. Most smallholders in the area are a lot more focused on household food production including vegetables, fruit and small livestock and thus much of the focus for this project was there.



Figure 9: Above Left: A CA plot in Nkau, with reasonably typical patchy growth. Initial improvement through CA in the 1st season, was not enough to convince participants to continue. Above Right: The really hard and compacted soil low in organic matter, proved difficult to dig out for trench beds in a number of the households.



Figure 10: Above Left and Eight; Household gardens in Nkau, Matatiele, showing extensive production of kale and rape, with more intensive production of green in a tunnel with drip kits and a tower garden. Participants appreciate the value of both practices to produce better quality crops under extreme weather conditions, especially frost in winter.

In the Eastern Cape, 21 participants across three villages (Nkau, Rashule and Nchodu) were interviewed using the resilience snapshot methodology to ascertain progress and changes. The results are summarized in the table below

Table 8" resilience snapshots for 21 participants from the Eastern Cape

Resilience indicators	Increase for Matatiele(n=21) August 2022	Comment
Increase in size of farming activities (Cropping areas measured, no of fruit trees and no of livestock assessed)	Gardening: 363m ² - 841m ² (231%)	Sizes of garden have doubled on average, range from around 35-2000m ²
	Field cropping: ~3000m ²	Field cropping areas have not expanded
	Fruit and other trees:	No new fruit trees in implementation period
	Livestock: 272-298 (8%)	More poultry kept (broilers and layers) for marketing. Some however lost substantial number of birds due to ill health and cold.
Increased farming activities	Yes (1 on ave)	A number of participants have re-initiated gardening and/or field cropping activities as well as poultry production (broilers/eggs)
Increased season	Yes	For field cropping - autumn and winter options and gardening throughout the year.
Increased crop diversity	Crops: 31 new crops (ave 11 per participant)	New crops include: Brinjal, parsley, coriander, leeks, thyme, lettuce, beetroot, green pepper, chilies, basil, green beans, rape kale, rosemary, carrots, Chinese cabbage, mustard spinach, spring onions, tomatoes, rosemary, fennel, broccoli, turnips, mustard spinach, kale, Sun hemp, lucerne, fodder rye, peas, sunflower, cowpeas
	Practices: 24 new practices (ave 10 per participant)	Practices include; Mulching, trench beds, tower gardens liquid manure, raised beds, furrows and ridges, 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, health and sanitation for poultry, brooding, JoJo tanks, RWH drums
Increased productivity	Gardening;>116kg/season/per farmer	Based on increase in yields (mainly from tunnels and trench beds for gardening) - Overall Kgs of a range of vegetables and herbs produced in a season
	Field cropping: > - 218kg/season/farmer	CA for field cropping - Overall kgs of a range of field crops - mainly maize, beans, cowpeas
Increased water use efficiency	Average: 6	Access, RWH, water holding capacity and irrigation efficiency rated. Scale:0= same or worse than before; 1= somewhat better than before, 2= much better than before x 4 criteria (values of 0 to 8)
Increased income	Average: R1031/month/farmer Range; R80-R3440	Based on average monthly incomes, mostly though marketing of produce locally and through the organic marketing system
Increased household food provisioning	Vegetables; 23kg/week	Food produced (overall Kgs per week) and consumed in the household
	Dryland crops (maize, legumes, sweet potatoes); 10kg/week	
	Poultry:2-3/month	
Increased food security	Average:4 food types/3x per week	No of food types/ no of times/week

Increased livelihood diversity options	Average: 1	Social grants, remittances, farming incomes, small business income, employment. Increase in no of livelihoods options used. Primarily from farming and small business income
Increased savings	Average: R322/month/farmer	Average increase in savings (Rands) Savings used for food, household education and production
Increased social agency (collaborative actions)	3	Participants generally belong to church groups and stokvels. New group collaborations include Learning groups, farmers' associations, village savings and loan associations, marketing committees.
Increased informed decision making	3	Own experience, experimentation local facilitators, other farmers/community members, facilitators, radio.
Positive mindsets	2	SCALE:0=less positive about the future; 1=the same; 2=more positive about the future; 3=much more positive. More to much more positive about the future: Much improved household food security and food availability.

In Matatiele participants doubled the sizes of their gardens, while field cropping and fruit production has not changed much. Livestock production, mainly poultry (layers and broilers) increased marginally by 8%, which was a combination of substantial increases for a few participants but decreases for most participants who found it impossible to manage small flocks of 10-20 birds profitably, given the sharp rise in transport and feed costs. Thirty-one (31) new crops have been introduced and are being grown in the area, as well as 24 new CRA practices. In this area participants were enthusiastic about trying out new crops, more specifically in their vegetable gardens and have now included a number of crops for localized sales including for example mustard spinach, Chinese cabbage and leeks. Productivity has increased and farmers are producing on average 116kg more of vegetables per season, indicating the expansion of production for both consumption and sale. Field cropping has reduced by around 220k per participant this season, indicating a very bad dryland cropping season in the area. Their food security has been improved and their incomes by an average of R1 031/month/ participant, primarily from farmgate sales. Savings have increased by R3222/month per participant. Participants are now involved in at least 3 more social organisations including the learning groups, savings groups, and marketing groups. They have improved their decision making, now working with local facilitators, and MDF staff. In summary their mindsets and outlook on their futures are more positive, with improved household food security and food availability

Case Study : Matankiso Rajoale from Rashule (Matatiele)

Matankiso Rajoale is a 53-year-old smallholder farmer from Rhashule, who farms with her husband. They have 2 children, 1 foster child and 4 grandchildren. She started farming in 2005 with the intention of making an income to help her husband to take care of their family as he could only find temporary jobs. The challenge was water and not knowing how to farm. She was planting common vegetables in the area like cabbage, turnips and rape. She generally planted these vegetables in winter and potatoes in summer. She was struggling with water and low yields. She also started a small tuck shop.

Figure 11: Matankiso Rajoale from Rashule in Matatiele, standing in a bed planted to mustard spinach. In the foreground is a bed of peas.

She joined the CRA learning group in Rashule in 2020 and feels that she has benefited greatly:

- She has introduced new crops that do well and are popular in the area. Examples are Mustard spinach, carrots and green beans – Sales from these alone have come to around R1 000/month.
- Introduction of trenches, shallow trenches and eco-circles have assisted her in improving her soils and increasing water holding in her garden and beds.
- The tunnel provides for very intensive production of high yielding, high quality crops
- She has learnt about the need to buy specific potato seed and different varieties that do well in different seasons and also in planting and managing them better. Yields have increased dramatically, and she also makes around R1 000 from sales of potatoes.



- On average she now makes around R2 000 from her garden every month,



Figure 12: Above Left: Matankiso uses her tunnel primarily for seedling production and Above right: A view of her garden beds including cabbages, turnips, kale and rape.

Matankiso also started having an interest in livestock for both business and integration with her crop farming, mostly to use kraal manure to add to the soil and making liquid manure to use for soil fertility and pest control. She started with 2 sheep and 2 cattle and now has 41 sheep and 15 cattle. She sells them locally, at between R1500 to R1800 per sheep. Cattle are sold at the auctions. At the latest auction she attended, she sold 4 cows for R28 000. Locally she sells a cow at R7 500. She uses the money to buy feed and medicine for her livestock and to assist with household needs or farming inputs. The challenges she has faced with livestock is getting medicine, and feed and theft in their village. She also started poultry farming in 2020, through the help of the learning group and sells eggs locally at R55 for a tray of 30 eggs. Originally, she was the only person selling eggs in the village and had a buyer who took the eggs to town, so she was doing well. Now, she has a competitor and selling is going quite slowly. She feels that due to COVID people in the village have less money to spend on food. In addition, feed prices in Matatiele are much higher than the feed she bought, and which was transported by MDF all the way from Pietermaritzburg, almost R150/bag. If she has to transport her own feed, it costs an extra R200 per trip. It reduces her profit margin considerably.



Figure 13: Above Left: Matankiso's layers house and Above right: Her kraal for her sheep.

She is very grateful for the support from SaveAct and Mahlathini, as they have helped her improve her farming and livelihood considerably.

4. *Village Savings and Loan Associations (VSLAs)*



Figure 14: Images of a VSLA share out meeting for the Senzokuhle VSLA in Madzikane (SKZN) in May 2022

Background of the VSLA programme

The vision of Mahlathini Development Foundation is to avail practical solutions that attract and sustain the interest of smallholder farmers to embrace Climate Resilient Agriculture (CRA) in their continued food production and income enhancement endeavours. However, there are at least three challenges that the programme should resolve.

Firstly, participating smallholder farmers draw their livelihoods from low and uncertain sources of incomes. This makes it very hard for smallholder farmers to invest substantial amounts of money into farming. Secondly, constrained access to useful financial services which is coupled with poor production infrastructure tends to frustrate their relationships with local markets. Lastly, there are competing priorities between household consumption and production as well as enterprise development and it is common, even for vulnerable households to use local and expensive debt instruments to fund their consumption appetites.

Faced with low levels of production, MDF has been promoting VSLAs amongst smallholder farming communities. Besides promoting smallholder farmers to use VSLAs as their financial institutions, the main objective of the VSLA programme has been to encourage smallholder farmers to use drawings from their VSLAs for productive purposes. There is evidence on the ground that some farmers are starting to use drawings from their VSLAs to finance their production operations. Further to this innovation, Mahlathini Development Foundation is piloting a concept of farmer production fund which seeks to encourage bulking of loan funds. This loan fund is referred to as a Bulk Loan Fund (BLF) and is currently piloted in Emmaus. In most basic terms, BLF encourages members of operational VSLAs to make once-off bulk annual contributions to build a larger loan fund.

Performance of VSLAs

There are 29 VLSAs including the 4 newly established VSLAs (2 in Ozwathini and 2 in Madzikane).

Membership stands at 510 participants, with a total contribution of R844 700 (USD \$52 793) but excluding R24 000 (USD \$1 500) contributed by the BLF (with 12 members). If the BLF is included, the total contribution is R868 700 (USD \$54 293) made by 522 members in 30 groups. However, the analysis below is done from 510 participants in 29 VSLAs. This data has been extracted from August 2022 records. US Dollar rate of R16.00 has been used to calculate the conversion.

Table 9: VSLA performance summarized for August 2022

RAW DATA	SA Rand	USD (\$)
Total number of VSLAs:	29	
Total number of participants:	510	
Total number of shares bought last month:	1393	
Rand value of shares bought last month:	R142 030,00	\$ 8 876,88
Cumulative shares bought:	8394	
Cumulative Rand value of shares bought:	R844 700,00	\$ 52 793,75
Loan amount repaid last month:	R136 306,00	\$ 8 519,13
New loans taken out last month:	R197 750,00	\$ 12 359,38
Bank balance/money in the box last month:	R272 720,00	\$ 17 045,00
Interest earned:	R272 720,00	
Annualised interest earned:		32,3%
Current wealth last month (new balance)	R1 117 420,00	\$ 69 838,75

An annualised interest earned of 32.3% is noted. Coincidentally, interest earned is the same as money remaining in the money box.

An analysis of average group performance is provided below.

Table 10: Average VSLA group performance: August 2022

ANALYSIS (GROUP PERFORMANCE)	SA Rand	USD (\$)
Average shares bought by a VSLA per month:	48,03	
Average Rand value of shares bought by a VSLA per month:	R4 897,59	\$ 306,10
Capacity to repay loan per VSLA per month:	R4 700,21	\$ 293,76
Average loan amount taken by VSLA per month:	R6 818,97	\$ 426,19
Average net worth per VSLA to-date:	R38 531,72	\$ 2 408,23
Interest earned:	R9 404,14	\$ 587,76

What is quite interesting is the following:

- Average savings per month per group of R4 897.59.
- The total amount contributed per group in a meeting is therefore R4 897.59 plus R4 700.21 (loan repayments) = R9 597.80, which is the average amount of cash put into circulation.

An analysis of average individual performance in VLSA groups is provided below.

Table 11: Average individual performance in VSLAs: August 2022

ANALYSIS (PARTICIPANT PERFORMANCE)	SA Rand	USD (\$)
Average shares bought by a participant per month:	2,7	
Average Rand value of shares bought by a participant per month:	R278,49	\$ 17,41
Capacity to repay loan per participant per month:	R267,27	\$ 16,70
Average spent by participant per month (shares + loan repayments):	R545,76	\$ 34,11
Average loan amount taken by participant per month:	R387,75	\$ 24,23
Net worth per participant to-date:	R2 191,02	\$ 136,94

What is noted above is the average total monthly amount contributed by an individual participant of R545.76, which is made of share purchase and loan repayment. The total net worth of each participant points towards opportunities for migrating participants towards BLF.

For most of the VSLA groups, it has been difficult to get members to disclose use of loans on a regular basis and this aspect of monitoring has thus lagged. Some reasons are the use of loans for non-productive purposes and as a form of insurance and "revolving credit facility". These trends are understandable given the increased pressure on poor households to survive,

with steep price increases for food and transport. It also suggests a focus on micro-insurance, so whether any savings can be made at household level in this regard, to ease up limited cash.

Bulk Loan Funds (BLF)

There is only 1 BLF that was formed in eStulwane in December 2021. It was established by 12 members, each contributing a once-off share of R2 000 totalling R24 000. The loan books now stands at R27 800.

The main goal of a BLF is to facilitate bulking of loans. These loans should be used mainly for productive purposes.

The profile of BLF is as follows:

All members of the BLF come from the existing VLSA. This has been the principle and non-negotiable rule for the BLF group establishment. The profile of the members of the BLF is as follows:

Table 12: Summary of BLF information: August 2022

Age of members:	Older than 35 but less than 55 years of age
Income sources:	Mainly state grants remittances - and re-investing some into enterprise development
Average Savings Per Month:	R300
Lowest Share-out Amount Received Last Year:	R4 000
Highest Share-out Amount Received Last Year:	R9 000
Lowest Loan Amount Taken Out:	R2 000
Highest Loan Amount Taken Out:	R6 000
Enterprise Development Activities:	Seasonal farming (vegetables and grains), broilers, eggs, trading, crafting, microloan enterprises
Household Consumption Priorities:	Buying of: <ul style="list-style-type: none"> ▪ Groceries, food items ▪ Appliances especially TV, fridges ▪ Furniture ▪ Building and/or renovating houses ▪ Education As well as making monthly contributions to a burial society and grocery stokvels
Future Training Requests:	<ul style="list-style-type: none"> ▪ Developing and using legally binding loan agreements ▪ Manufacturing broiler and egg layer feeds/mash ▪ Learning to drive a car ▪ Operating a successful microloan enterprise ▪ Growing BLF

Key observations

There are some benefits that have been observed over time and that support the CRA programme. Firstly, VSLAs act as glue and promoter of co-operation and social cohesion amongst the smallholder farmers and VSLA participants that are not members of farmer learning groups. Secondly, VSLAs present multiple opportunities for participants to learn (and transfer learning) specifically in terms of personal financial education. Participants learn to budget, manage debts and learn new ways of improving household incomes. Lastly, VSLAs are the main platform to advance enterprise development objectives.

Just over half of borrowers in the BLF are using loans for income generation. In the last report, it was highlighted that at least 51.7% of BLF loans were used for enterprise development, 31.7% was used for non-productive consumption and 16.7% was used to settle debts outside the BLF. For the VSLAs, most participants use loans for household consumption, with only around 18% of loans being used for productive purposes.

One thing that is very obvious is that a lot of cash is circulating in these communities. At present around R716 800 worth of shares/cash is held amongst the 24 groups, which is capital that is available for local enterprises and consumption smoothing. It would be important to investigate in more detail the psychology of the members, with regards to the use of their financial drawings (micro-loans and share-outs).

5. Local incomes and marketing

Income summaries

Most of the sales for smallholder farmers occur under the following circumstances:

- Food first, income from surplus (80% of participants)
- Expansion of existing cropping areas and types and number of crops grown (10-15%)
- Production specifically for sale (1-5%)

The following avenues have been explored:

- Farmgate (within villages); small local potential with low income ceilings
- **Local market stalls (combined across villages); much larger range of products and income potential, also now focus on labelling, branding, pricing, value adding and processing**
- Bakkie traders, stores in local towns (individuals and groups within villages); generally, commodity focused, and farmers are price takers – good for larger quantities but no competitive advantage
- Sale to local retailers and supermarkets (individuals); requires transport, intermittent, price takers, little stability, competitive – overall potential low

The local market stalls have provided the best option for marketing in the two years of implementation and show a large potential for expansion, both in number and size. Farmgate sales have been the most common for field crops, poultry (eggs and broilers) and livestock. The following table provides a summary of average incomes for each of these 'commodities' across the two seasons of implementation.

Table 13: Average incomes for commodities supported in the CRA learning groups: per participant.

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	R209,41	R3 713,00
Beans	R237,50	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 (incl all commodities but excl the selection)	R3 059,41	R36 712,92

*NOTE 1: Rand value for food was calculated from the resilience snapshots, 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 resonates well with actual incomes outlined by participants, which were between R750 and R3650 on average across the sites.

Values for the table have been averaged across all participants who were monitored, and we assumed that a particular participant is involved in the production of all commodities supported in this process (poultry, dryland crops and vegetables). It thus provides a reasonable estimate of average potential incomes (profits – after subtraction of input cost) for participants in this programme. This is a substantial livelihood improvement and is often more than participants receive from other sources, such as grants.

Local market stalls

This strategy of aggregating all produce across a selection of villages and selling monthly at a market stall based at a central point such as a grant pay point or taxi rank, has been the main intervention for this project. It has included working with participants on pricing, produce quality, labelling and branding of produce and the stall. It appears to be the most appropriate strategy at present, that can accommodate for small quantities of a range of products as well as inconsistency of supply. It also ensures that farmers can charge reasonable prices for their produce.

The table below provides a running total of sales from the market stalls between April 2021 and August 2022, for the two areas where these stalls have been successfully set up: Bergville and Ozwathini (Midlands).

Table 11: 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	
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	VEGETABLES: Broccoli, cauliflower, cabbage, kale, chinese cabbage, mustard spinach, leeks, onions, lettuce, carrots, beetroot, green peppers, chilies, brinjals,
2021/08/04	8	4	R3 866,00	Bamshela - Ozwathini	green maize, green beans, tomatoes,
2021/09/03,06,07	12	5	R5 448,00	Bamshela - Ozwathini	HERBS: coriander, parsley, fennel,
2021/10/05,06	12	5	R3 354,00	Bamshela - Ozwathini	FIELD CROPS: Maize, dry beans, sweet potatoes, amadumbe, pumpkins, butternut
2021/11/03,04	9	4	R2 964,00	Bamshela - Ozwathini	FRUIT: Bananas, avocados, naartjies, lemons
2021/10/11	3	2	R19 800,00	Sale to shops in Bergville: Boxer and Saverite	MEAT: Pork, broilers, chicken pieces, eggs
2022/03/02	19	4	R1 310,00	UEDA – Emmaus Hall	PROCESSED FOOD: Bottled chilies, mealie bread vetkoek
2021/12/02,03	10	4	R2 964,00	Bamshela - Ozwathini	OTHER: incema, seed potatoes, pinafores, grass brooms, mats, beads, art work
2021/12/03	10	4	R1 400,00	Ozwathini- social media	Combo packs - via social media in Pietermaritbrug: Potatoes, carrots, eggs, chillies, onions, cabbage (half and chopped), green beans, beetroot, avocado, brinjals, green peppers, chopped mixed veg.
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	
2022/06/02,03,04	7	4	R4 782,00	Bamshela - Ozwathini	
2022/07/05	11	3	R2 500,00	Bergville town market stall	
2022/08/03	17	6	R4823,00	Bergville town market stall with FSG farmers	
2022/08/04,05,06	7	3	R4248,00	Bamshela-Ozwathini	
	11	4	R96 626,50	INCOME: ~ R6 901 800/month	Ave income per participant: R382 per market day (R100-R1,600)



Figure 15: 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.

For both marketing groups, the participants now manages the whole process of marketing independently, and MDF only supports on rare occasions when transport shortages are unavoidable. They also keep their own records and provide copies for MDF for reporting purposes. Farmers have learnt which produce has high demand at the market stall and can now estimate

the quantities needed for each market reasonably accurately. They still sell out, however, but no longer have large quantities of unsold produce to take home again. They have also built a reputation among buyers, as they have been careful to be there regularly. They provide social support to each other and if individuals have family emergencies, others in the group will take their produce to the market and do the sales for them.

Preparation for market days entails quite a lot of planning and logistics as groups need to come together to list their produce availability and quantities, prepare produce and price tags, arrange transport, their market stall equipment and who will be selling on the day. They also manage the record keeping of sales and distribution of monies between farmers involved. For Ozwathini, as they have decided to sell for 3 consecutive days each month, they have arranged for storage space in Bamshela, close to where they have their stall. For this group a social media platform for sale of produce to a number of individual buyers in Pietermaritzburg has also been set up. This platform (WhatsApp and Facebook) is managed by the MDF facilitators, as is transport and delivery.

There are some challenges in the process:

- The number of farmers that participate in the market has decreased, compared to when they all started. This has a knock-on effect on the produce (volumes and varieties) available to sell.
- Some of the commodities that farmers produce, are the same i.e. cabbages, spinach, eggs. The impact is the creation of competition among them.
- Some farmers continue to prioritize buyer-seller relationships developed locally and as a result bring smaller volumes of produce to the market. This is a cautious decision made as the market is a “once-in-a-month-event”.
- Farmers are not familiar with using social media platforms, especially to advertise and sell their produce. Despite them taking ownership of the market in terms of planning, coordinating and execution, they are still largely dependent on MDF staff to support with online advertising

The highlights of these market stalls include:

- Farmers are managing to plan their production to coincide with the once monthly marketing process and have managed to have a range of high-quality crops available.
- Sales have been picking up again, after the unrest a year ago and is now becoming a “real income” for them
- Farmers have added meat (pork and chicken) and processed (bottled chillies, mealie bread) products to the market which attracts more costumers.
- Every farmer that participates in the market makes some money.

In conclusion, around a year after the initiation of the markets, they show a level of consistency that is sustainable, despite irregularities in sales, volumes, varieties and availability of commodities and farmers have and continue to learn from the process how to adapt to change as and when it arises.

6. *Strengthening of Innovation platforms and networks*

Mahlathini staff have been involved in a range of multistakeholder platforms and networks in the 2years during project implementation. We have also been involved in participatory research activities, exchanges, conferences, webinars and open days. The intention is always to share our work as widely as possible, to learn from others and to provide some influence towards broader implementation of community-based adaptation and innovative and responsible development models for the rural poor of South Africa. The table below provides a few significant examples.

Table 12: Stakeholder interactions summary: August 2022

Activity	Description
Okhahlamba Local Municipality (OLM)	Fresh produce market, planting support, materials provision. Linkages to uThukela Economic Development Agency and uThukela Water. And interaction with local councillors
F4CJ (Farming for Climate Justice)	Joint participatory research process with Zingela Ulwazi in Mpumalanga and Coventry University in the UK. It included surveys, focus group discussion, cross visits, farmers’ days and a webinar presentation at Asset Research at Stellenbosch University. Farmers open day and cross visit from farmer in Mpumalanga

Ecosystems Services research – Water Research Commission	Joint partnership with the Centre for Water resource Research at UKZN for research in ecosystem services mapping and development of improved governance systems in the Northern Drakensberg. This has included a small budget for spring protection work in Stulwane village.
Asset Research – Maize Trust	Quantitative experimentation with conservation agriculture in smallholder farming systems including awareness raising; farmers open days, popular articles, webinars, videos. Presentation at the national CA forum
Adaptation Network	Part of Capacity building and learning working group, for co-implementation of Flemish funded promotion and strengthening of Community based Adaptation as well as exploration of vulnerability assessments with Bread for the World and provision of webinars on nature-based solutions and climate resilient agriculture
South African Mountains Conference	Presentation of a paper entitled: Community based climate change adaptation in the central-Drakensberg improves resilience of smallholder farmers
Agroecology network: Food governance CoP	Panel member for Agroecological Transitions and Local Governance webinar and process
WWF- Water Source Area focus	WWF team visit to the Bergville area, with subsequent joint funding proposal development in volumetric water benefit accounting
SANBI- Living Catchment Programme	Co convenors of the Northern Drakensberg multistakeholder water forum, in conjunction with the Institute of Natural Resources. Participants of the SANBI uThukela catchment indaba
WWF- Nedbank Green Trust	Webinar presentation on agroecology transitions
UCP partnership	Presentation at the 24th quarterly multi stakeholder session “Update on CRA implementation in partnership with WWF and further involvement in subsequent quarterly planning sessions. Training for eco champs in the region in CRA
Livestock auctions cross visit	With Association for Rural Advancement, farmers cross visits to two livestock auctions in Ladysmith and Lions River to talk to farmers and the AAM auctioneers

7. Publications

Presentations and publications undertaken during the project period are listed below

Desiree P. Manicom and Erna Kruger. January 2021. The Impact of COVID-19 ‘Hard’ Lockdown Disaster Management Regulations on Small-scale Farmers: The Case of Central and Southern KZN Small-scale Farmers Employing Climate Resilient Agriculture Production. *Alternation Special Edition 32, 2020.* Print ISSN 1023-1757; Electronic ISSN 2519-5476. Pgs 145-172.

8WCCA: Bern Switzerland 21-23 June 2021. SESSION: Experiences and Investments in Conservation Agriculture and Sustainable Mechanization for Smallholders in Africa (23rd June). Case study II: Conservation Agriculture Innovation Systems Build Climate Resilience for Smallholder Farmers in South Africa. Erna Kruger, Mahlathini Development Foundation.

Presentation of a paper: *CbCCA in central Drakensberg improves resilience of smallholder farmers.* (E Kruger, M Toucher and R Henriksson) at the Southern African Mountain Conference 14–17 March 2022. A formal paper is in process, to be submitted by 30 September 2022

A number of less formal presentations have also been provided on online platforms and webinars including for example:

- Natura based Solutions- Adaptation Network
- Vulnerability assessments for CCA- Adaptation Network and bread for the World
- Agroecology Transitions – Agroecology Network
- CRA implementation- Umzimvubu catchment Partnership and
- Agroecology principles and practice – WWF and Nedbank Green Trust.

2 COMMENT ON FINANCIAL REPORT

NOTES ON EXPENDITURE

Expenditure has been compiled up until the end of August 2022

1. Staff cost: Staff costs are somewhat higher than the budgeted amount for this period. This was compensated for by reducing the external evaluation fees for the project
2. Operating expenses- Materials: A slight over-expenditure on this budget item has been internalized by MDF
3. Overall expenditure was on track with no large variances within specific budget items.

Below is a summary of the financial report.

The financial report excel sheet is attached as a separate document: WWF_Financial report_GT06177_ID315_CRA KZN-EC_20220830. Documentation for explaining full expenditure summaries is available on request.

WWF: GT06177 Financial report		Date:30 August 2022		Milestone 8			
Code	Description	ESTIMATES		ACTUALS			
		Project Budget Oct 2020- August 2022	Full Year 2nd Oct 2020-June 2022	Previously Reported YTD Actuals	This quarter Actuals (June- August 2022)	Year-to-Date (YTD) Actuals	Forecast minus YTD Actuals (=Variance)
	A - OPENING BALANCE	R3 000 000,00	R2 700 000,00	R2 746 655,78	R253 344,22	R3 000 000,00	-R300 000,00
	Cash received	R2 700 000,00					
	Other income (interest, FX gains/loss)	n/a					
	B - TOTAL income + o/balance	R2 700 000,00	R2 700 000,00	R2 222 500,00	R2 700 000,00	R2 700 000,00	R300 000,00
	EXPENDITURE by code						
1	Staff costs	R1 210 066,50	R624 466,50	R1 199 300,58	R128 315,68	R1 327 616,26	-R117 549,76
2	Third party fees	R458 919,00	R237 219,00	R330 603,32	R57 210,92	R387 814,24	R71 104,76
3	Travel and Subsistence	R446 809,50	R230 959,50	R426 812,71	R19 996,79	R446 809,50	R0,00
4	Capital Asset costs	R0,00					
5	Operating expenses; materials	R755 865,00	R181 523,00	R720 804,17	R35 060,83	R755 865,00	R0,00
6	Meetings / Education / Training	R0,00					R0,00
7	Project Promotion / Communication/ Printing / Publication	R37 260,00	R19 260,00	R24 500,00	R12 760,00	R37 260,00	R0,00
8	Project Evaluation by 3 rd party	R91 080,00	R47 080,00	R44 635,00		R44 635,00	R46 445,00
	C - TOTAL EXPENDITURE	R3 000 000,00	R1 340 508,00	R2 746 655,78	R253 344,22	R3 000 000,00	R0,00
	D - CLOSING BALANCE	R0,00	R1 659 492,00	R0,00	R0,00	R0,00	-R300 000,00

For all implementation activities, except the fodder supplementation, namely Conservation agriculture (CA, tunnels and gardening and small livestock (broilers and layers), the actual number of beneficiaries supported with both learning and limited input support were quite a bit higher than proposed. Despite this increase, the demand for coherent support has far outstripped the capacity of this process.

In terms of expenditure, the budget allocations and use for the various activities is summarized in the small table below.

Table 13: Summary of expenditure on CRA activities: August 2022

Cost breakdown	Aug-22	Remainder	Budget (2021 and 2022)
Poultry	R205 826,17	-R42 768,67	R80 000,00
Tunnels	R432 849,20	-R2 199,20	R430 650,00
Seedlings, marketing, consumables	R25 490,14	R69 009,86	R94 500,00
CA (2 seasons)	R130 068,82	-R2 353,82	R127 715,00
Fodder supplementation	R7 708,31	R15 291,69	R23 000,00
	R801 942,64	-R41 997,64	R755 865,00

As can be seen from the breakdown above, expenditure on materials and support exceeded the budgeted allocation of R755 865 by ~R42 000. Allocations within each activity area differed somewhat from budgeted amounts, with some over expenditure for poultry, tunnels and CA and under expenditure on marketing and fodder supplementation. This over-expenditure has been internalized into MDF operational budgets.

3 CONCLUSIONS

Changes now and expected changes

4 LESSONS LEARNED

Work has been hampered by ongoing climate variability, initially drought, high winds and late onset of summer rains and more recently late season flooding in KZN. The adaptive capacity of the climate resilient agriculture practices have not been able to buffer farmers against all these shocks. The methodology allows farmers themselves to prioritize which practices they implement. Some of the more conservative or risk averse farmers then do not change their systems significantly enough to cope. An example here is farmers who have not managed to build a mulch of stover in the CA fields, through allowing livestock to fully graze this resource. High levels of rainfall this season saw a lot of erosion in these fields with seed and crops being washed away. Others did not mark out and plant on contour, with a similar result. Ways to re-enforce the learning that a coherent suite of practices are required, will be considered into further implementation cycles. Localized cross visits between farmers at appropriate times as well as more in-depth review and learning sharing events are some suggested interventions.

Both COVID-19 and the July 2021 riots have had a significant impact on smallholder communities, severely taxing their social safety nets and reducing their subsequent ability to recover. Unforeseen consequences have mainly been in the ongoing unavailability of farming inputs and supplies and the rather dramatic increases in fuel and food prices. For some of the farming practices, the increase in prices is making implementation untenable for quite a large proportion of the participants. This relates mainly to field cropping and broiler production and more specifically in the more isolated villages and areas. Although activities such as savings groups, local production of feed, and bulk buying of inputs have been initiated in some of the villages, these are not robust enough to deal with the sharp spikes in costs. Further financial smoothing mechanisms are needed.

The deepening poverty and vulnerability has led to increased volatility in the villages. There is a marked increase in livestock theft, theft from small businesses and harassment of women. All of these require coherent interventions. New vulnerable groupings have come to the fore; young single mother with children and what we call the missing middle, which are households where the parents are between the ages of roughly 45-65 and where no grants are received but no-one in the household is employed. These groupings will need to be targeted urgently.

The CRA learning groups and associated activities have provided a lifeboat for farmers and has managed a significant improvement in their food security and livelihoods as well as coherent social organisations. There are however still significant governance issues in the communal tenure areas, more specifically around natural resources, water and grazing management. So, for example, livestock invasions of fields and gardens are common, with little to no consequences for the livestock owners. Uncontrolled grazing of stover in fields and uncontrolled burning of veld leads to degradation of soil health and grazing capacity. A requirement of bringing Traditional Authorities closer to communities and allowing more civil society organisation and mandated intervention is seen as important, as is integrating as much as possible the role of the Tas and the local councillors and municipalities.

Incomes have increased and so has food security. Nutrition diversity in most instances however remains quite low with only 2-5 different food types being consumed on a regular basis. It means that the dietary problems in these areas, in the forms mainly of micronutrient deficiencies in young children and obesity and non-communicable diseases such as hypertension and diabetes are still very common. A nutrition focus needs to be combined with the CRA implementation to being to alleviate these social and health pressures.

A common difficulty in farmgate sales, is that demand and prices drop the more people in a village produce the same crop or commodity. Income ceilings are also quite low as the only clientele are neighbouring households. Although this is a good strategy for participants to start selling odd surpluses in production, it is not a sustainable strategy in the longer term. More effort needs to be put into brining these people into the joint marketing initiatives being promoted in the villages.

Any additional and complementary information to support the FINAL report (including photographs) should be attached as annexures to the report.

List of annexures you attached (if any).

Assets status: List the Assets purchased with the Project Value, stating in each case the age and condition.

Review by WWF-SA Senior Manager: Senior Manager Name: _____

Review by WWF-SA Impact Lead: Mkhululi Silandela

Review by Green Trust Manager: Augustine Morkel

Great Outcome	1	
Good Outcome	2	
Not as expected	3	