

RESILIM-O:

Resilience in the Limpopo Basin Program- Olifants

MILESTONE 4: Progress Report No 3

Under the
Lower Olifants catchment
Agricultural Support Initiative (AgriSI)

30/11/2018



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ABOUT USAID: RESILIM

USAID's Resilience in the Limpopo River Basin (RESILIM) program addresses ongoing degradation in the river Basin in southern Africa, where people face water shortages, increased floods, and declines in crop productivity as climate change further stresses an already water limited region.

There are two components to the program; one operating at a basin-scale (RESILIM-B, which is implemented by USA-based Chemonics and addresses similar issues at the scale of the four SADC member states that share the Limpopo Basin (South Africa, Botswana, Zimbabwe and Mozambique) and a catchment-scale project (RESILIM-O) that It is being implemented by the Association for Water and Rural Development (AWARD). Both projects share the same overall objectives. You can find out more information on the RESILIM projects on www.usaid.gov website and www.award.org.za.

The USAID's RESILIM-O focusses on the Olifants catchment. The program aims to reduce the vulnerability of people and ecosystems in the Olifants Catchment specifically, by improving how transboundary natural resources are managed. By understanding the systemic causes of vulnerability, including climate vulnerability, it is promoting new ways of thinking and acting to promote integrated water and biodiversity management.

ABOUT AWARD

At AWARD, we recognize that the natural world's resources are limited, and undergoing rapid depletion and transformation. We know current practices of use and management are inadequate to deal with the changes and challenges we are facing. We design practical interventions to address the vulnerability of people and ecosystems, and merge considerations from both environmental and social perspectives. Our approach involves thinking across disciplines, boundaries and systems.

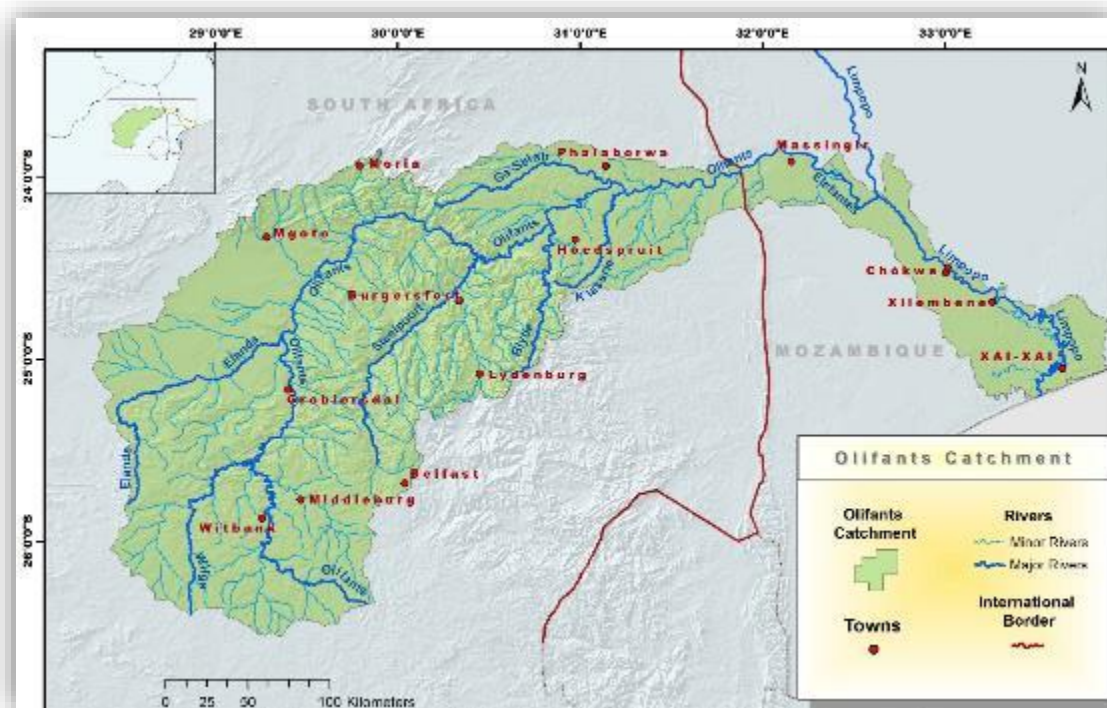
We are working with diverse people and institutions in the water and biodiversity sectors in the Olifants River Catchment to understand the multiple vulnerabilities to change, including climate change. Along with quality scientific contributions, our engagement in the socio-political context of the Olifants River Catchment allows us begin to begin to institutionalize integrated, resilience-based practices, providing a foundation for robust development policy and practice in the in this river catchment, and beyond¹.

The Olifants Catchment: An overview

The Olifants River Catchment falls within the Limpopo River Basin, which is part of an international drainage basin that stretches across South Africa, Mozambique, Zimbabwe and Botswana. In fact, the Olifants River contributes nearly 40% of the water that flows in the Limpopo River making it an important catchment in the system as a whole².

¹ AWARD: Annual Report.2016/2017 Financial Year. RESILIENCE IN THE LIMPOPO – OLIFANTS.10/31/2017

²As above



AWARD, 2017.

At the heart of this catchment is the Olifants River, a vital artery that flows for 560 kilometres through South Africa and into Mozambique, where it is known as the Rio dos Elefantes in Mozambique.

This mighty river originates in South Africa's Mpumalanga Highveld, flowing northwards before curving in an easterly direction through the Kruger National Park and into Mozambique, finally finding rest in the salty water of the Indian Ocean near Xai Xai, just north of Maputo.

The main tributaries of the Olifants River are the Wilge, Elands, Ga-Selati, Klein Olifants, Steelpoort, Blyde, Klaserie and Timbavati Rivers.

Along with its tributaries, it is one of the six major Lowveld river systems, occupying an area just short of 55 000 square kilometres. It traverses three provinces in South Africa; Gauteng, Mpumalanga and Limpopo. About 3.5 million people live on the South African side of the catchment. In Mozambique, it flows through Gaza Province, which is home to about 700 000 people.

A system under change

Our catchment is the foundation of our livelihoods and development. Yet the river and associated natural resources in the Olifants Catchment are under threat.

Unchecked pollution, inappropriate land resource use, weak and poorly enforced policies and regulations and poor protection of habitats and biodiversity are degrading the Olifants at an alarming rate. What's more, the area is however under threat from factors such as mining for heavy metals, inappropriate land management, rural sprawl and unsustainable use of natural resources. This affects the level of goods and services provided by the ecosystem.

The diverse population groups living in the Olifants Catchment all have one thing in common; they rely on the river and the catchment's natural biodiversity for their livelihoods. This reliance can be direct or indirect. Rural communities rely on it for things such as traditional medicine, grazing and browse, fuel, food and housing materials. Some people in river-side communities harvest reeds, collect water from the river for



washing and drinking and use it for recreational and spiritual practices. Subsistence farmers in Mozambique rely heavily on the catchment's flood plains. There are also large mines and associated industries, large scale agriculture and the wildlife economy, which all rely on a healthy, functioning river system. Often people forget that what they do upstream affects people downstream, sometimes with dire consequences.

The catchment is our home and it is worth investing in its future. The work reported here is part of the ongoing activities of the RESILIM- O project under the grant from USAID: Southern Africa.

Project partners



Mahlathini Development Foundation (MDF) is a small public benefit non-profit organization consisting of rural development practitioners who specialize in participatory learning and action processes, sustainable natural resource management and low external input farming systems, including a focus on rain water harvesting, conservation agriculture, intensive homestead food production, food security, climate change adaptation micro finance and enterprise development.

MDF designs and implements rural development programmes and training processes providing learning processes for adults all the way from semi- literate farmers to post graduate university level. We work in partnership with government and non-government organisations alike. We are sensitive to and mainstream where possible gender, disability and people living with HIV/AIDs



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1 Executive Summary

1.1 Progress for the reporting period

Continuation from reporting for Milestone 3 Phase II:

- Seasonal cluster review workshop
- Organic mango production; field assessments and training (Sedawa, Mametja Lepelle, Turkey)
- Expansion of organic herb and vegetable marketing process into Turkey
- Delivery of fruit trees orders (Lepelle - mangoes, citrus, litchis.)
- Report backs on water issues and borehole assessments (Lepelle, Sedawa)
- Traditional poultry production training (all villages)
- Learning revision workshops; Fenale and Botshabelo
- Garden and tunnel monitoring; Sedawa, Turkey, Botshabelo, Mametja.
- Agroecology network meeting at University of Mpumalanga, Nelspruit

IMPLEMENTATION TEAM

MAHLATHINI: Erna Kruger, Sylvester Selala, Betty Maimela and Andries Maponya (intern)

AWARD: Cryton Zazu, Bigboy Mkhabela,

Note: Sylvester Selala resigned in October 2018. He is replaced by Betty Maimela and a new intern who started in October - Andries Lethabo Maponya

2 Project Objectives

2.1 Overview of RESILIM-O Project objectives

RESILIM-O is large multi-faceted, multi-stakeholder, cross-boundary programme to reduce vulnerability to climate change through building improved transboundary water and biodiversity governance and management of the Olifants Basin through the adoption of science-based strategies that enhance the resilience of its people and ecosystems through systemic and social learning approaches. The programme has been running for four years and is being implemented by AWARD (The Association for Water and Rural Development) with funding from USAID.

The Agricultural Support Initiative (AgriSI) was initiated as a sub-grant process within the larger programmed towards the end of 2016. This initiative works specifically with climate change adaptation processes with smallholder communities in both the middle and lower Olifants River basin. In the lower Olifants it is being implemented jointly by Mahlathini Development Foundation and AWARD.

The Agricultural Support Initiative (AgriSI) addresses two of the RESILIM-O programme objectives directly:

- i. To institutionalize systemic, collaborative planning and action for resilience of ecosystems and associated livelihoods through enhancing the capacity of stakeholders to sustainably manage natural resources of the Olifants River Basin under different scenarios
- ii. To reduce vulnerability to climate change and other factors by supporting collective action, informed adaptation strategies and practices and tenable institutional arrangements.

2.2 Sub-grant Project Objectives



Sound agro-ecological practices for soil and water conservation (SWC) and the ability to self-organise and act collectively are regarded as fundamental for building adaptive capacity and resilience to climate change. Not only do agro-ecological farming approaches require minimum external inputs - which may be expensive and increase dependency if subsidized - but they foster farmers' sense that they can build sustainable futures from local inputs and efforts. With knowledge about the potential impacts of climate change included in the learning journey, farmers can make purposeful decisions around practices such as seed saving and crop-type to plant. This approach supports livelihood diversification - also fundamental for increased resilience - through 'value-added' associated activities such as seedling production, tree nurseries and bee-keeping, harvesting and processing of marula fruits into jam and other usable products.

The overall aim of the Agricultural Support Initiative is to enhance the resilience of the people and ecosystems in selected villages (5-8) in the Lower Olifants River basin, using a systemic social learning approach, exploring the question: *What are you learning about the socio-economic and biophysical characteristics of your environment and how these are changing and how are you able to respond to that?*

The overarching objective of this work is to provide support for increased adaptive capacity and resilience to the effects of climate change for households involved in agriculture in select communities of the Olifants River Catchment through:

- Improved soil and water conservation and agro-ecological practices for increased food security
- Livelihood diversification and supplementation through alternative climate resistant production;
- Increased community empowerment as a result of self-organisation and collective action.
-

3 Milestone Description

3.1 Definition of milestone and purpose

Each milestone and progress report indicate activities under the broad themes of learning and mentoring, introduction to innovations and experimentation, collaborative work and networking undertaken during the reporting period.

The table below summarises these activities against the milestone and indicate achievement of these milestones.

Table 1: Summary of deliverable completion under Milestone 4: 10 October- 15 December 2018



	Activities planned	Completed?	Expected outcomes	Completed?	Verification documentation	Completed?	Reference
Learning & Mentoring: In all 6 communities each 2 days	Learning & Mentoring: -Learning sessions; *Fruit production and traditional poultry production training for all groups Gardening revision workshops; Fenale, Botshabelo	C	-Learning groups; learning sessions - (Sedawa, Mametja, Botshabelo, Turkey, Lepelle, Willows, Oaks, Fenale)	C	Progress report on outcomes including the following documentation: 1. Photos & photo diaries 2. Farmer work plans 3. Garden monitoring	C	1. Photos in reports and- All photos saved in directories and kept by Erna 2. Farmer work plans are recorded in the garden monitoring forms 3. 44 Garden monitoring forms across six villages
Introduction to innovations and experimentation:	-Individual farmer experimentation, garden monitoring. - Tunnel implementation	C	- Garden monitoring conducted for 29 participants across 4 villages, including LF's -Monitoring of tunnel implementation across 3 villages	C C	4. Monthly assessments 5. Cluster activity records 6. Event materials, attendance registers	C	4. In this report 5. Appended to this report 6. Appended to this report
Networking: 1. Local facilitator networking 2. Open days, cross visits 3. Review and planning sessions	-Networking; Agroecology best practise workshop -Cluster network session; Impacts of activities -Organic marketing initiative	C	-Workshop held in Nelspruit on 22 nd November Seasonal cluster review session in October 2018 Expansion of organic marketing to Turkey	C C C		C	

4 Approach/ Process/ Activities

4.1 Summary of activities

This section gives an indication of activities undertaken during the reporting period to achieve the outcomes for this period, time spent and people involved.

Table 2: Summary of activities for the reporting period October-December 2018.



DATE	DESCRIPTION OF ACTIVITY	Time	WHO WAS INVOLVED
2018/10/01-10/10	Milestone 3 report	5 days	Erna
2018/10/01-05	Seasonal Cluster review workshop - all villages; mango producers field assessment visit	5 days	Betty, Erna, Sylvester, Anri, Nelson, Geoff, Cryton, Bigboy
2018/10/08-12	Setting up tunnel experimentation for 15 participants across 3 villages, sorting out chameleons and weather stations	5 days	Betty, Sylvester
2018/10/15-19	Fruit tree order deliveries, herb sales, monitoring	5 days	Betty, Andries
2018/10/22-26	Garden monitoring, (turkey, Sedawa, Botshabelo, Mametja, herb grower workshop, turkey, herb and veg sales	5 days	Betty, Andries
2018/10/29-11/02	Organic mango production training at HH (4 days), herb sales	5 days	Betty, Andries
2018/11/05-09	Tunnel implementation monitoring	5 days	Betty, Andries
2018/11/12-16	Gardening practices revision workshops, monitoring of chameleons and set up tunnel experimentation for this season	5 days	Betty, Andries, Sylvester
2018/11/19-23	Agroecology best practise workshop, poultry production training, marketing review meeting with HH and Hlokomela	5 days	Erna, Betty, Andries, Sylvester, Mazwi, Khethiwe.
2018/11/26-30	Tunnel monitoring, mini workshops to review water issues progress, Turkey, Sedawa, weekly marketing process and planning workshops. Milestone 4 report	5 days	Betty, Andries, Erna
2018/12/03-14	Monitoring and weekly marketing process	10 days	Betty, Andries

Sylvester: 20 days, Erna: 20 days, Betty: 55 days Andries: 45

5 Progress and Results

5.1 Learning and mentoring

Learning processes conducted are summarised in the table below

Table 3: Summary of learning sessions conducted: October-December 2018

Village	Date	Activity	No of participants	Comments
Lepelle, Sedawa, Mametja	2018/10/02,29-02	Organic Mango production training with Hoedspruit Hub	10,29	-Field visits to Lepelle and Sedawa to assess mango production and issues with trees -4 day training including a visit to Bavaria estate
Lepelle, Sedawa, Botshabelo, Mametja, Fenale, Willows, turkey	2018/10/04	Seasonal cluster review session	75	Review of season, report back on tunnels and experimentation, water issues and organic marketing,



				planning for upcoming season
Turkey	2018/10/23	Herb growers' workshop with new participants in turkey	26	Betty provided follow up training in herb production and marketing for the two learning groups in Turkey
Fenale, Botshabelo, Sedawa, Mametja	2018/11/16,17	Gardening practices revision workshops	9,16	Review of gardening practices for those groups who requested
All villages	2018/11/20,21	Poultry production training	42,44	Focus on traditional poultry and production of poultry feed at household level

5.1.1 Seasonal cluster review workshop

Date of workshop: 04 October 2018 (75 participants)

5.1.1.1 Agenda: Peer review and planning for the CSA innovation development programme - (AgriSI) in the Lower Olifants.

This is a yearly event to review progress, tackle issues and broadly plan for the year going forward for the learning groups involved. It also involves showcasing present successful activities and community level discussion around issues and possible solutions.

TIME	Facilitator	Activity	Resources
9:00-9:30am	ERNA	Introduction; review of five fingers and general comments for this season -	PP: data projector, chords, screen
9:30-10:30	SYLVESTER, BETTY	Small groups to work on practices they are using under each of the five fingers and report back to plenary	Newsprint, kokis
10:30-11:00	ERNA	Compare this to the list of practices introduced in the trainings and add these to the lists	PP presentation
11:00-12:00	ERNA, SYLVESTER	Plenary for traffic lights, no of participants implementing and also comments on these practices (How much to they help)-	
12:00-1:00pm	ERNA	Presentation on experimentation and measurements Discussion on herb growers and how that is going	Pp presentation
1:00-1:45pm	SYLVESTER, BETTY	Small groups discuss experimentation and practices for the next 6 months (summer season) and make a list (with names of who will do those) and report briefly to plenary Including succession and continuity planning for herb and veg sales. Including new ideas... poultry...	Newsprint, Kokis
		Announcements: Mango production training 29-31 October 2018	
2:00-3:00pm	Christina	Visits to households	
3:00pm		LUNCH	

5.1.1.2 General comments



Report back from Ukuvuna cross visit

15 Participants from these groups attended a 3 day cross visit to the Ukuvuna learning sites in Sekhukhune. Report backs were made by Alex Magopa and Christina Thobejane.

They talked about

- Tree propagation using cuttings. This method is used if you want particular tree type and do not have seeds. It works for oranges, naartjies, peaches, grapes and roses. This is an in situ method where growing medium is tied onto the desired small branch and it is left there for around 3 months until roots are formed, before the branch is cut away from the tree.
- Use of tobacco for pest control. A brew is made from the young leaves only as the older leaves are too strong. It has been noted that the older leaves are tougher and thus harder to extract the active ingredient from and that tobacco should not be used on crops from the same family such as tomatoes and potatoes.
- An easy way to plant and harvest potatoes; is digging a ditch and planting the potatoes in there and then filling this ditch as time goes along. It reduced the need for time consuming ridging activities.
- Youth are involved there, and it would be important to encourage our youth here also to do farming
- We can start having poultry, so that we can use the manure in the garden and for compost and liquid manure instead of having to buy manure
- Many different herbs were shown and are being grown; including yarrow (for stress relief), comfrey (for bones and liquid manure), parsley, coriander, wild mint (Mabele Mabutswa - for pest control), Wild Dagga, Geranium.
- A lot of different things were learnt as their gardens are full of different kinds of crops. However, we now have a market for our crops, which they do not.
- They build seed houses, that they insulate on the inside using old egg boxes and they place old sugar cane on top of the roof. A gutter is installed and the run-off collected. This sweet water is used as a kind of liquid manure on the gardens. This sugar water will provide for very sweet fruit from fruit trees.
- Mixed cropping; alternate rows of Lucerne and vegetables - this is for soil fertility and also saves water. Lucerne is very deep rooting and thus it can find water in the soil and does not need that much watering.
- Flowers can be planted for pest control in between vegetables; they also attract birds and bees, which are needed for pollinating crops.
- They also shared on the issue of livestock integration - feeding them from the garden and using their manure in the garden- like a cycle. This was a highlight for us.

This visit encouraged us to put more effort into our farming, even if we do not have much water. Some farmers there see farming as a full time job- they are busy in their gardens every day for the whole day. Mr Malatjie asked that these participants try out some of the ideas, so that our learning groups can also learn these techniques in that way and also that they share some of the seeds they were given.

One of the fruit seeds that they brought with, were strawberry seedlings which they bought from one of the farmers they visited who specialises in planting strawberries. Trona Morema, planted them inside her tunnel, where she made a shallow trench bed that she built using cement bricks. See the picture below



Mango production household visits

A few participants in Lepelle and Sedawa were visited by Jeffery Tshishonga, a farm manager at Landman Group the commercial Mango estates (Bavaria), so that he could give them advice on mango tree management and also check on issues with deficiencies, pests and diseases. This information will also be useful in designing the upcoming Organic Mango Production training, organised through the Hoedspruit Hub for the (29-31 October 2018).

Report backs from the participants visited by Jeffery Tshisonga highlighted input on pruning - both water shoots, and excessive branches to ensure that all flowers have access to sunlight. This can increase fruiting substantially. Also, the tips of the branches that bear fruit are pruned in winter to stimulate more fruiting branches. He emphasised that pruning shears should be used for straight clean cuts and not the pangas people have been using. He spoke to irrigation and suggested they build basins around their trees to allow for around 200-400l of irrigation in one go. Watering like this needs to be done once a week or bi-weekly. Also, the leaves that fall from the trees should not be swept away but placed around the tree as mulching. Spraying for powdery mildew needs to be done when the trees are flowering. There are fungicides that are not too harmful that can be used as powdery mildew is very common. A few of these fungicides are acceptable under organic mango production systems.

Review of CSA practices

Here small groups made lists of practices falling into the five finger categories (water management, soil management, crops, soil fertility and soil health and natural resources). These practices were then assessed for their effectiveness or impact; participants indicating who is using the practice and comments were made. The traffic light system of assessment of implementation was used (red - none or very little); (yellow- can be improved) and (green- good implementation.)

The table below summarises this exercise

Practice	Implementation	No of people (N=62)	Comments
WATER MANAGEMENT			
Mulching		23	Saves water, suppresses weeds
Furrows and ridges		9	Make sure you allow the grass to grow before you turn the soil. Helps control soil pests
Banana basins		13	Prevents water run-off, provides fertility and water for the trees as you add leaves and compost before planting the trees



Roof water harvesting	Green	50	Tanks for storage not enough, so this does not last long and does not work in the dry season. We use this water for drinking
Underground tanks	Red	2	Very expensive and have now been dry for a long time as there has been no rain. Holds 24 000l, but even that was not enough to use for gardening
Stone bunds	Yellow	15	Reduces erosion and holds water
Diversion ditches	Red	4	This helps to control and increase the amount of water that goes into the garden
Small basins	Yellow	18	Provides some extra water for the crops planted.
SOIL MANAGEMENT			
Use feedbags to make ridges	Red	2	Control soil erosion
Plant grass on bare soil	Red	0	Good idea, but no-one is implementing this. Can use lemon grass, black oats for example, this planted grass prevents weeds from growing
Contour planting	Yellow	9	We are more aware of this now and are doing this in the larger fields
Plant trees around the fence and yard	Red	9	For wind protection; Not much planting of trees now, due to drought, but it is known to be a good idea. Plant any kind of no fruiting tree to protect the fruit trees in the yard.
CROP MANAGEMENT			
Correct timing of irrigation	Red	7	Early mornings or late afternoons- this reduces stress and wilting
Planting sweet potatoes	Yellow	15	Works well on ridges and furrows and works even in these hot, dry conditions - but needs some watering
Tunnels (shade houses)	Yellow	10	These work extremely well and all participants are interested
Bulbinella	Red	3	To trap water and is used for medicinal purposes (introduced by MDF)
Using organic pest control remedies	Green	15	Chilli and aloe and liquid manure works well. Not many pests seen
Liquid manure	Yellow	10	Use black jack leaves, chicken and goat manure - works well
Keep loosening the soil	Green	27	Traditional practice -(in fact not recommended for soil health and soil structure- causes compaction, and capping)
Drip irrigation	Yellow	10	Helps to use less water and save the water especially if mulching also used. Plants grow well
Use of herbs in-between veggies	Green	21	This is now becoming common practices. It helps for pest control, water management
Trench beds	Green	28	They make a big difference - good looking crops, big and healthy
Shallow trenches	Green	16	Easier than trenches with a similar result. Can be done on larger areas
Compost	Red	4	Labour intensive, not enough water
Use of manure	Green	62	We all now use manure and understand that the soil needs to be fed
NATURAL RESOURCES			
Less cutting of trees	Green	62	We are all aware and trying to save the trees
Minimising veld fires	Green	62	We are all aware and are not burning veld fires



Planting of indigenous trees		26	We are all aware and are doing this on a small scale in our yards
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Presentation of experimentation results

A power point presentation was given (attached) that outlines the results of the experiments in the tunnels (trench beds inside and outside the tunnel and also furrows and ridges outside the tunnel). It was shown how the water productivity is much higher inside the tunnels and also how this is substantially increased is deep watering and mulching is used. A cost benefit analysis showing the amount of profit possible for a tunnel was also shown (R900 for 3-4 months), using spinach as an example.

A presentation was also done on the organic marketing of vegetables and herbs. Participants explained to the group how the process works and some results of incomes made and specific crops sold were presented.

Hoedspruit Hub has tried out a number of different avenues for marketing - each with their own positives and negatives

Market	Requirements
Local restaurants and health shop	Small quantities, can deal with some variability of crops, but quality must be good
Veggie boxes; facebook page	Medium quantities; quality must be good, required regular supply and lots of different crops
Supermarkets (Lebamba, PicknPay)	Larger quantities; lower price, continuity of supply is absolutely crucial
Friends and individuals	Small quantities, will more likely take what is available,
Saturday farmers market and boot car sales	Tested dried herbs and pesto as well as vegetables. - Small quantities need good quality and regular supply.

It was discussed that these were all an initial testing of the market in Hoedspruit and that the farmers' desired market of supermarkets could in fact be the most difficult and least rewarding as they want contracts, large and continual supply and pay less. At the moment farmers are getting high prices as produce is sold as organic and directly to consumers.

Crops with a HIGH demand: flat leaf parsley, basil, onions, spinach, beetroot, green beans, sweet potatoes

Crops with GOOD demand (smaller quantities): curly leaf parsley, coriander, fennel, cabbage,

Crops with LOW demand: local tomatoes (the buyers do not like the variability in size and shape of the tomatoes)

New crops to focus on: baby marrows, carrots

Suggestions for more participants to come on board (at the moment 10-15 participants only)

- There has to be quality control at the village (learning group) level before produce is taken to the market.
- Planting intervals are important; so you have to plant regularly and not wait for everything to be harvested before planting again. We need to set up planting calendars for all the groups
- Protect the market by providing good quality and sticking to the requirements (borehole water for washing, correct weights and packaging)
- Each village must make a plan -types of herbs and vegetables
- Number of people
 - Sedawa: 13
 - Lepelle: 2
 - Turkey: 9
 - Fenale: 5
 - Mametja: 5
 - Botshabelo: 3
- A contact person was chosen for each village - who will ensure availability lists are made for the village and that the orders are prepared and delivered on time at the right places



Name and Surname	Village	Phone number
Mogofe Mabiletse	Turkey	0724151686
Julia Maneneng		
Patricia Ngobeni	Lepelle	0717006817
Tronah Morema	Mametja	0799107186
Joyce Mafologele	Mametja	0799849098
Lucy Seemole Malepe	Botshabelo	0760158315

Planning for upcoming year

Below are summarised points related to group discussions for future activities. A general point was made that due to the continued lack of access to water, that the groups would focus on small intensive gardening activities. People are focussed on making more trench beds as well as raised beds with organic matter as these are the best practices for now. There was a plea made to not forget about the issue of livestock however.

1. **Water issues:** Turkey also wants to be part of this process and discuss local options and potentials
2. **Underground RWH tanks:** given the difficult conditions there is a large interest in underground tanks; but funding would need to be found to do this. *24 People made requests*
3. **Conservation Agriculture:** Given the continued dry conditions in the area a group decision was made to focus this activity on the fields of individuals who have some irrigation. Experimentation with diversification of crops (including legumes) as well as some fodder production options are to be considered. There are (9-12 individuals). Crops requested: sorghum, cowpeas, juko beans and runner beans
4. **Organic herb and vegetable marketing:** This process has now been piloted and is to be expanded into 5 of the 6 villages. Each learning group will set up their own internal process for managing production, orders and deliveries
5. **Indigenous poultry production:** training and support on breeds and local level feed production for indigenous poultry. *Training set up for 19-20 November*
6. **Lucerne:** introducing mixed cropping with Lucerne into the gardens
7. **Strawberries:** these were seen in Sekhukhune and people would like to try them
8. **Revision workshops:** These are important as new people come on board all the time and older participants can take part to assist in the learning and mentoring.
9. **Handouts:** were again requested.



Announcements

- ✓ 6 October: Borehole survey and siting with Raymond Vonk, in Sedawa and Mametja.
- ✓ 29-31 October: Organic Mango production training; 15 participants from Lepelle and 5 each for Turkey, Sedawa, Mametja. 19-20 November: Indigenous poultry and broiler production training - 2 workshops with groups of interested participants from all participating villages
- ✓ 22 November: Agroecology workshop- Nelspruit

5.1.2 Herb Growers' Workshop; Turkey



The organic marketing system has been expanded to include turkey more coherently. A workshop was held for 26 participants on 23rd October 2018, to induct them into the system and discuss planting calendars, delivery options and produce quality.

The Agenda was as follows:

Introduction

- Herbs, uses and production
- Planting in their gardens
- Discussion on record keeping

Hoedspruit Hub market

- What kind of market HH is running
- Who are our clients
- Size of the market
- What kind of herbs and vegetables are we selling
- How do we weigh the herbs using a scale

Water

- Where are we getting your water
- What kind of water must be used to wash the herbs and vegetables

Logistics

- Weekly orders
- The meeting place for collection
- Who delivers the herbs and vegetables to Hoedspruit Hub
- How do you contribute for transport

SUMMARY OF THE WORKSHOP

During the Cluster review workshop at Sedawa on the 04/10/2018, there was a presentation of the herb market focusing on the progress and how much people have made within two months. Mr Malatjie requested that this process be formally extended into Turkey.

Participants needed some reminders about the names and uses of herbs they had been planting through the AgriSi process; uses are both culinary and medicinal

Mostly farmers have never kept records and are not aware how long it takes from planting to harvest. The importance of keeping these records was emphasised as they need to learn how long it takes, so that they can plan how often and when to plant their different successions of herbs. They also need to record how much they harvested over what period of time.

Hoedspruit Hub market

The understanding is that the smallholders can supply small quantities and that this supply is likely to come in batches for now, rather than being consistent and continuous. It is understood as well that quality may vary. Hoedspruit Hub is assisting in the marketing process by finding different customers who need different herbs and vegetables. Examples are:

- Restaurants including Blue Mountain, Hat and Creek, Sleepers and the local health shop
- Lebamba Supermarket
- Pick and Pay
- Individuals in Hoedspruit; through a veggie box scheme advertised on Facebook
- Weekly farmers' markets



The market is still being developed and thus things can change at short notice; this includes prices, sizes of bunches and packaging, depending on who the buyers are. A list is made of what farmers have to offer and this is presented to the customers. The customers then choose what they want to buy. In the process we can also find out what they prefer and what crops they would like that we as farmers are not yet growing

Table 4: A list of the herbs and vegetables currently being sold and the weight and price of these crops

Herb/vegetables	Kg	Price
Coriander	100g	R20,00
Parsley flat leaf	100g	R20,00
Parsley curly leaf	100g	R20,00
Basil	100g	R20,00
Rocket	100g	R20,00
Fennel	100g	R20,00
Lemon grass	100g	R20,00
Mint	100g	R20,00
Brinjal	Per kg	R15,00
Sweet-potatoes	Per kg	R25,00
Spinach	Twenty leafs	R18,00
Round tomatoes	Per kg	R15,00
Onion	Per kg	R15,00
Cabbage	Per kg	R20,00
Beetroot	Per kg	R15,00
Spring onion	100g	R20,00
Baby marrow	Per 350 g	R20,00
Green beans	Per350 g	R20,00

Participants were shown how to use the scale by Mmatshego and Betty to ensure that they do the correct thing. Firstly, we harvested curly leaf parsley from Sarah Mohlala's garden and washed the parsley then weighed 100g of curly leaf parsley.



Right and far right: Mmatshego demonstrated how to harvest, wash and weigh a 100g bunch of curly leaf parsley.

Water for gardening and washing produce

Participants explained the challenges that they are facing when coming to water. They do get their water from the municipality borehole once a week in some sections; other sections rely on spring and borehole water. They also used to pay a local person, who had reticulated pipes from a local spring, but he was unreliable and even with paying R70/ per month, there was often no water. They have now stopped this arrangement. Most are buying water or asking from neighbouring households, to water their gardens and for household consumption.



Participants held a meeting before this workshop to discuss how they can copy what Sedawa has started to get their own water and not rely on municipal water for farming. They decided to set up smaller groups according to their sections to collect monies for setting up a borehole for each section. Both the sub-groups agreed to contribute R500,00 per household towards having borehole water. The contributions will start from the first of November 2018 till the 31st of January 2019. They decided on borehole water also because then there would be no question about water quality as water reticulated from local springs can be contaminated.

They also selected members for the water committee:

- Chairperson: Michael Magobatlou
- Vice chairperson: Mogofe Elias
- Secretary: Mabiletse Mogofe
- Treasurer: Angelina Malatjie

Logistics

People committing to the marketing process:

1. Michal Magobatlou
2. Sarah Madire
3. Norah Tshetlha
4. Elizabeth Mogatla
5. Sarah Mohlala
6. Mabiletse Mogofe

The group chose Mabiletse to coordinate the market and communicate with Betty and MDF. Participants will call or sms her to let her know what they have in their gardens and how much. Mabiletse will forward a summary with the names, types of herbs and vegetables and quantities on a Monday morning to Betty.



The collection point will be at Mabiletse's home in Turkey 1. Mr Malatjie is to assist if there is a need.

They suggested joining the Sedawa group in terms of transport, as doing this jointly will decrease transport costs. Thus, the produce will be taken from Turkey to Sedawa and then everything will be added together and taken to the Hoedspruit Hub. Participants agreed on paying Mabiletse's transport and her airtime. Mabiletse will also distribute the money, after the 15% contribution of transport has been deducted by Betty.

The agreed on planting the following herbs:

- Rocket
- Basil
- Parsley curly leaf
- Parsley flat leaf
- Thyme
- Fennel
- Lemon grass

Participants prefer planting using seedlings instead of seed because:

- The seedlings are already a few weeks old and need less effort, time and water to grow.
- You harvest sooner than when you sow seeds.



- The only concern that farmers raised is that seeds are cheaper than seedlings, but Norah Tshetlha explained that seedlings might be expensive but she managed to get herself 200 seedlings of curly leaf parsley for R15,00 in Tzaneen, thus 75c per seedling. Not all suppliers of seedlings are this cheap, but at that price it is definitely worth planting seedlings instead of seed

5.1.3 Organic Mango Production training

This consisted of two processes:

1. A household visit by Jeffrey TShishonga Mango Estate Manager for Bavaria to assess the situation and provide advice and troubleshooting for the smallholder farmer participants.
2. A 3-day training workshop held at the Hoedspruit hub.

5.1.3.1 Household visits

On the 2nd of October 2018 Mahlathini and Hoedspruit Hub, accompanied by Jeffrey TShishonga a farm manager at Landman group, conducted household visits in Lepelle and Sedawa.

George Sebatane (Lepelle)

George has 42 peach mangos and one grafted mango tree. The trees were planted by his late father in 1969. From all these trees George only harvests around 24 crates per year, to be sold in bulk for achar and juice. His yields should be higher given the general good condition of his orchard and the availability of water.

George has cut back some branches on his trees. He was given specific advice by Jeffrey on how best to do this pruning, to ensure that the sun can reach all flowering branch tips on the trees. If this is not done fruiting is reduced and this also increases the incidence of powdery mildew in the trees. This disease was noticed on a number of George's trees.

Right: A picture of George's mango orchard where he, Neil and Anri are listening to Jeffrey.

Far right: A view of George's irrigation furrows, leading here to a small nursery of mango seedlings.



Jeffrey also pointed out the Girly fly from the same farm, which affects the leaves and flowers leading to dark spot on the flowers, where infected flowers drop from the tree. George was advised to use a spray of diluted milk as a fungicide.



Shakes Seerane (Lepelle)

We also visited Shakes Seerane in Lepelle. He planted mango trees in his back yard and he also has a farm where he has planted fruit trees; mangoes and bananas.

Right: Mango trees in Mr Seerane's back yard. These trees are pruned every year after harvest, to allow the sun to reach allow the branches increasing yield, and were considered to be in prime condition by Jeffrey.



Above left to right: Mr Seerane's orchard, a closer inspection of some of the mango trees and a fruit fly found in the orchard.

In all, he has planted 56 mango trees; 1 Langes, 5 Tommy and 50 Sugar. He planted these trees in 2016. During the visit Jeffrey commented that the trees should be bearing fruits now, but they haven't started, which might be because Mr Seerane has been over irrigating his trees. He uses drip lines and microjet sprinkles, which provide around 50l of water /hour, meaning these trees get around 450l/ day as the irrigation is left on for the whole day. The idea is to stress the trees a little in winter (through not irrigating) to increase fruit set, otherwise vegetative growth will be favoured.

We also found Natal fruit fly in his farm. Fruit flies cause direct damage by puncturing the fruit skin to lay eggs. During egg laying bacteria from the intestinal flora of the fly are introduced into the fruit. These bacteria cause rotting of the tissues surrounding the egg. When the eggs hatch, the maggots feed on the fruit flesh making galleries. These provide entry for pathogens and increase the fruit decay, making fruits unsuitable for human consumption' <https://www.infonet-biovision.org/PlantHealth/Pests/Fruit-flies>.

He also advised Mr. Seerane with respect to pruning and suggested that he cuts out the two central branches in each tree, which grow straight up and become dominant, shading the rest of the tree.



Josephina Malepe (Sedawa)

She planted 24 mango trees in her household garden: 4 Peach, 12 Kent, 7 Indian and 5 Fish mangoes. She sells to the local community. The major problem encountered was that she doesn't water the trees enough, leading to a decrease in production as the trees drop their fruit when too dry.

Right: The group clustered under one of Josephina's mango trees discussing watering and pruning options

Mpelesi Sekgobela (Sedawa)

She has planted 30 trees of mangoes in her household garden; a mixture of Tommy, Kent, Sensation and 'Fish' mangoes. In her case pruning has been a little too drastic and she was not to cut on the branch collars (which is a swelling that forms around the base of the branch that forms where the branch and trunk tissue meet. These are the areas on a tree that initiate the callus growth to protect the wound created by the cut). She was also advised to water the trees and build small dams around the trees to avoid water run-off during watering.

There was some incidence of blossom malformation on Mpelesi's trees (the disease is known to cause abnormal flower, leaf and shoot growth).

The farmers were happy and thankful for the knowledge that was shared. One belief that was held in the community that was dispelled in this session is that pruning after harvesting reduces yield in following seasons.

FLOWERING

- Occurs around August.
- Flowering can be induced by stressing trees in winter- no watering June-July - otherwise the tree will provide new growth rather than flowering from the growing tips

PRUNING

- Remove water shoots; from the base and centre of the tree
- Cut large branches out of the middle of the tree that shade other branches
- Ensure that all flowering branches receive sun- to provide dappled shade on the ground
- Use cutting sheers- not pangas to cut branches
- Cut back the flowering tips after fruiting in June-July



5.1.3.2 Organic Mango production training at Hoedspruit Hub

A three-day training course was offered to 27 participants from Lepelle, Sedawa, Mametja and Turkey, including Betty and Andries at the Hoedspruit Hub from 29-31 October.

Right: Anri from Hoedspruit Hub addressing the participants during the Mango production course



5.1.3.2.1 Day 1

1. Overview of programme
2. Organic mango production in Africa - its challenges
3. An introduction to soil structure and soil fertility management
4. How to make compost (theory)
5. Proper establishment of the mango orchard



6. Introduction to proper maintenance of mango trees

Framers outlined their expectations as being; learning how to increase their production, interested in knowing how marketing works, pests and disease management, compost making, kinds of manure used for improving soil fertility and learning about pruning and grafting.

Farmers shared their challenges as primarily being a shortage of water, bad soil and lack of markets to sell their mangoes.

Organic mango production in Africa

Challenges of agriculture in Africa: Most farmers think farming mangoes is easy but it is not, because there are a number of challenges that you might encounter as a farmer, including;

- Poor quality
- Pests and disease problems
- Poor management
- Postharvest losses

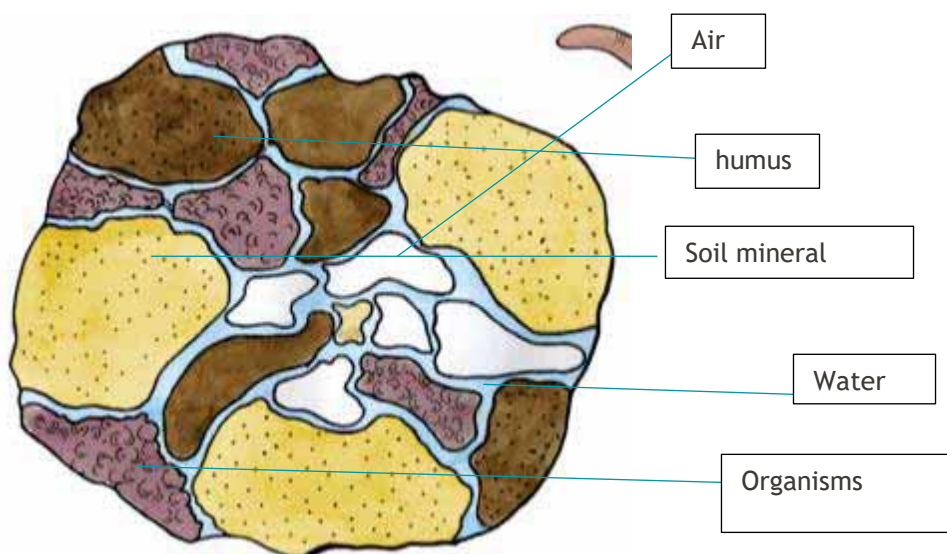
Anri also explained that, even though they are offering the training in organic mango production, there is as yet not an established market for organic mangoes. This is being explored with Bryanston Market that sells organic fruit. Anri explained to farmers that Africa has challenges in agriculture. The first challenge that they all knew was climate change, which leads to low soil fertility, limited access to safe and sustainable inputs, shortage of land, low yields and limited access to reliable markets.

Characteristics of the best agricultural system: Farmers were asked what they think contributes to having the best agricultural system in your farm. Most of the farmers said you have to first make sure that you have fertile soil and that you have knowledge about the crop you are growing.

Organic farming differs from traditional farming in that it relies on non-chemical inputs by implementing the following practices such as inter-cropping, crop rotation, green manure, compost and biological pest control) to maintain soil productivity, soil fertility and control pests. In other words, we look after nature and nature looks after us.

Introduction to soil structure and soil fertility management

Farmers were taught about types of soil structure and soil erosion. The group was already well versed in these concepts through their interactions with Mahlathini. Under the importance of organic matter, they were taught about the structure of organic matter. The picture below was used to explain and show farmers what the structure looks like using a microscope.



Above: Soil structure, including organic matter as seen under a microscope

Farmers explained that they have been taught about the importance of organic matter, that but they have never thought it could also help their trees.

Three steps of organic soil fertility management

- Step 1: Soil and water conservation; e.g. stone packing, mulching, irrigation basins, water furrows
- Step 2: Soil cover; mulching cover crops and green manures
- Step 3: Organic supplements; liquid manure and plant teas.

How to make compost

Nelson taught farmers on day one in class how farmers can make their own compost instead of buying fertilizers, which are not organic. He also taught them about the importance of investing in compost production. Compost in their garden is a balanced fertilizer (source of NPK), it improves the soil fertility in the long-term, destroys diseases on crop residues and weed seeds in the heating phase and it also suppresses soil borne diseases.

Materials you need for making your own compost

- Crop residues
- Animal manure (not fresh)
- Green plant material
- Ash
- Algae
- water

How do you make good compost?

You can use different methods to do your compost; some people prefer to dig pits in the ground and fill materials layer by layer, mixing dry material, green material, a thin layer of top soil/ashes and cattle manure. This is then watered and finally covered with grass or banana leaves. Trench beds are another example of this. The most usual way is to make a heap/pile.

Compost will go through three phases of decomposition; first the heating phase where bacteria develop, second, the cooling phase, where fungi develop and small animals begin habitation and third, the maturing phase where humic acids form.



5.1.3.2.2 Day 2

Review of day 1:

- We learned about using compost that you made for yourself around the mango tree to improve soil health and as a result get good quality mangoes.
- We learned about balancing three elements to have good compost; sun, water and air.
- We also learned how to make our own compost instead of buying compost.
- Learned how to grow mango tree using mango seeds. Firstly, after eating you clean the pip and dry it for five days. Secondly, before planting you cut open the shell of the pip and place the cut side face up, with the flat surface facing down. This is done so that when the seed starts to grow, it will shoot straight out of the soil instead of looking for direction.
- We also learned about spacing mango trees when planting in your farm.
- Learned about pollination and the importance of bees in our garden.
- Learned about pruning and the importance of pruning a tree.

Making compost (practical)

Firstly, it was explained why we had all the materials and why it is important to make your own compost for your garden.

Then the process was started; First add dry materials, then wet or green materials, then ash and finally and organic activator. Mix the activator with water in a 500ml bottle which was cleaned, then shake for 15 minutes, then transfer to a 20l bucket with water. Finally using a funnel, we apply the activator liquid as the last step in the layering. If the activator is not available then one can use cow, goat and chicken manure (not wet manure).





Above: Pictures showing the compost making site and box designed to hold the compost, as well as a pile of manure to be used

The pictures above show the sequence of making compost; dry material, then wet material, then ash and the activator and finally water.

Practical pruning demonstration

This was done by Jeffery, a farm manager at Landman's group. He firstly explained what pruning is - It is cutting back of a tree to increase production and yield. He also explained that we don't prune small trees after the initial formative pruning; we only remove new small branches to shape up the tree and for the tree to focus its energy in growing. With larger trees, structural pruning is undertaken;



we cut or prune the tree to allow the sun to reach all the branches of the tree, which will help in increasing production. We only prune a tree after harvest.

He continued by showing farmers how to graft trees. Grafting of mango trees consists of transferring a piece of mature or fruit bearing tree to a separate seedling rootstock. First you have to look at the size of the tree you want graft, so you can find the right size wood bud for it. The wood bud can be wrapped and refrigerated for two to three days and used, but he advised that we use fresh wood buds. When grafting you wrap the joined wound with a tape in a manner that no air or water can affect the wound. You will keep the wrapped tape until it removes itself to ensure successful propagation.

Right: Jeffrey explaining and demonstrating pruning.

He also advised farmers on the kind of mangoes that will grow well with the kind of environmental conditions their facing, which was Kiet mango. This was good news for them since the market prefers Kiet, Kent and Tommy mangoes.

Improving flowering and fruit formation



- Young grafted trees may flower within two years; fruit formation should be avoided because it affects the growth of the tree. Flowering should be permitted in the fourth year.
- Keeping the orchard clean by removing all ripe fruits and weeds around the trees.
- Mango trees are sensitive to climatic variations; low temperatures at night and dry climate improve flower formation.
- You can practice smudging, which is a practice of smoking moist organic material (grass or leaves) under the tree before flowering to induce flowering. Smudging is done towards dry season when mango trees are ready to flower (July-August).
- Smoking materials can be mixed with aromatic herbs like lemon grass or lantana

Water management and saving

- How do I ensure best use of rainwater?
 - Irrigation water is kept at minimum in order to allow for effective use of available water resources, as an organic farmer to ensure best use of rainfall water and water harvesting, they can use the following; planting in pits, contour ridges, furrows and stone-lines. This will also help reduce erosion.
 - Establishing a diverse cropping system.
 - Mulching to prevent the soil from being washed away and protecting it from the heat - reducing water loss through evaporation.

Pest and disease management

The most destructive mango pests are the mango seed weevil and the mango fruit fly, which was found in Shakes Seerane's orchard Lepelle.

Mango seed weevil and mango fruit fly

- During the larval stage, it does more damage as it burrows through the flesh into the seed, where it will feed until fully mature inside the seed.
- When it matures it tunnels through the flesh, leaving a hole on the fruit skin which will be an entry for fungal infections.
- The pest can spread into clean areas through the movement of infested fruit for propagation or consumption.
- Mango seed weevil can be managed by;
 - Continuously monitoring your orchard for any infected trees or fruits. Regular fruit scouting during fruit growth.
 - Ensuring good orchard sanitation
 - Applying sticky bands when the tree starts flowering.
 - Can plant certain herbs in your orchard like dill, parsley, cosmos, sunflower and marigold or you can introduce natural enemies.

5.1.3.2.3 Day 3

Organic certification and marketing

Participatory guarantee systems

- Nelson taught farmers about PGS (participatory guarantee system), since farmers explained that for now, they can afford to pay for an inspector to certify their products, since they will need certification to access the market.
- Participatory Guarantee System is a locally focused quality assurance systems. They certify producers based on active participation of stakeholders and are built on a foundation of trust, social networks and knowledge exchange.



- He also explained why the certificate carries access to the market. Firstly, it ensures that everyone in the organic supply chain adheres to the organic regulations, it also confirms that the product carries an organic label,
- PGS is an affordable inspection process, as most is done by the group itself, which reduces inspector fees.

A PGS is formed by a group of farmers, consumers and retailers together, to ensure that farmers adhere to organic regulations. Inspection will be done once a year

Site visit to Mango Nursery

Farmers did a site visit to Bavaria Estate mango nursery with Andy and Emile taking us through the orchard. Andy took the farmers through a process of grafting. Firstly they normally use Saber mango as a rootstock and graft with any type/variety (Kiet, Kent or Tommy)

Right: Farmers in the Bavaria Estate mango nursery Far Right: Andy explained the process of grafting, while one of the farm workers demonstrated the process



One rootstock of Saber can be grafted with different varieties of mangoes.



The picture below is an example of one rootstock grafted with different varieties of mangoes.

Above left: The rootstock has been grafted with three different varieties; Piva, ZIII and NanDocMai. Above Right: This shows a point where the rootstock was joined with the fruit bearing scion

From the nursery we moved to the compost site behind the nursery.

Right; The Estate's composting site where all the leaf litter and other organic waste is collected to be used in compost made for the orchards



From the compost site we went to the mango tree site, to see the kinds of mango trees they are growing, how the trees are pruned, ways of irrigation and to also look at how sanitation is done.

Far Right: Emile used a soil auger to show how drip irrigation saves water, as it provides water directly to the roots of the tree. The soil is moist underneath even if it looks dry on top.



Right: Our learners at the end of the training session - well informed and enthused for their organic mango production



5.1.4 Organic herb and vegetable marketing process

This process has continued. A number of different marketing options have now been tried, including setting up of a Facebook page for Hoedspruit hub to do the weekly order of organic boxes and also farmers markets.



Above left: the Hoedspruit Hub Facebook page and above right; Nelson and friend manning the stall at the farmers market on the 6th of October 2018. Hoedspruit Hub was selling all coriander, parsley flat leaf, parsley curly leaf, fennel, lemon grass, basil and pesto (made from parsley and coriander) at the market. The market went very well; they managed to sell 75% of the herbs and 100% of the pesto.

Progress with marketing has been very positive and a number of new participants have been brought on board. The herb and vegetable marketing group has also now been formally set up in Turkey (see section 5.1.2 above). Below is a table outlining the sales in October-November 2018.

Table 5: A record of herbs and vegetables sold in the organic marketing initiative with Hoedspruit Hub: August-November 2018



Date	Herbs	No bundles	Price	Amount	Total
2018/08/17 to 2018/09/28					R10 118,00
2018/10/05	Parsley flat leaf	15	R20,00	R300,00	
	Parsley curly leaf	45	R20,00	R900,00	
	Brinjal	10	R15,00	R150,00	
	Lemon grass	4	R20,00	R80,00	
	Cabbage	3	R20,00	R60,00	
	Basil	7	R20,00	R140,00	
	Beetroot	18	R15,00	R270,00	
	Spinach	6	R18,00	R108,00	
	Tomatoes	10	R15,00	R150,00	
	Fennel	3	R20,00	R60,00	
	Sweet-potatoes	18	R25,00	R450,00	
	Green peppers	9	R11,00	R99,00	R2767,00
2018/10/12	Green pepper	4	R11,00	R33,00	
	Parsley flat leaf	17	R20,00	R340,00	
	Parsley curly leaf	13	R20,00	R260,00	
	Mint	2	R20,00	R40,00	
	Spring onion	1	R20,00	R20,00	
	Cabbage	4	R20,00	R80,00	
	Basil	10	R20,00	R200,00	
	spinach	21	R18,00	R378,00	
	Tomatoes	5	R15,00	R75,00	
	Fennel	5	R20,00	R100,00	
	Sweet-potatoes	7	R25,00	R175,00	R1668,00
2018/10/19	Parsley flat leaf	20	R20,00	R400,00	
	PParsley curly leaf	5	R20,00	R100,00	
	Spring onion	20	R20,00	R400,00	
	Brinjal	6	R15,00	R90,00	
	Rocket	4	R20,00	R80,00	
	Basil	22	R20,00	R440,00	
	Round tomatoes	9	R15,00	R135,00	
	Spinach	8	R18,00	R144,00	
	Cabbage	2	R20,00	R60,00	
	Sweet-potatoes	7	R25,00	R175,00	R2024,00
2018/10/26	Coriander	6	R20,00	R120,00	
	Parsley flat leaf	25	R20,00	R500,00	
	Parsley curly leaf	10	R20,00	R200,00	
	Rape	1	R15,00	R15,00	
	Lemon grass	10	R20,00	R200,00	
	Cabbage	4	R20,00	R80,00	
	Basil	14	R20,00	R280,00	
	Beetroot	5	R15,00	R75,00	
	Baaby-marrow	9	R20,00	R180,00	
	Spinach	9	R18,00	R162,00	
	Tomatoes	11	R15,00	R165,00	
	Spring onion	17	R20,00	R340,00	
	Fnnel	3	R20,00	R60,00	
	Sweet-potatoes	14	R25,00	R350,00	
	Rocket	8	R20,00	R180,00	R2887,00
2018/11/02	Rocket	12	R20,00	R240,00	
	Parsley flat leaf	32	R20,00	R640,00	
	Parsley curly leaf	15	R20,00	R300,00	
	Lemon grass	10	R20,00	R200,00	
	Cabbage	3	R20,00	R60,00	
	Basil	7	R20,00	R140,00	
	Baby marrow	6	R20,00	R120,00	
	Spinach	6	R18,00	R108,00	
	Thyme	18	R20,00	R360,00	
	Fennel	3	R20,00	R60,00	R2248,00
2018/11/09	Parsley flat leaf	27	R10,00	R270,00	
	Parsley curly leaf	10	R10,00	R100,00	
	Pepper	4	R11,00	R44,00	
	Baby marrow	6	R20,00	R60,00	
	Thyme	12	R10,00	R120,00	
	Fennel	1	R10,00	R10,00	
	Basil	3	R10,00	R30,00	
	Beetroot	5	R15,00	R75,00	



	Spring onion	4	R10,00	R40,00	
	Spinach	5	R18,00	R90,00	
	Onion	4	R15,00	R60,00	
	Brinjal	8	R15,00	R120,00	
	Sweet-potatoes	4	R25,00	R100,00	
	Green beans	3	R20,00	R60,00	R1 239,00
Total sales					R21 855,00

The table indicates an income of around R21 855,00 for a period of three months. This equates to an average income for each participant of ~R500/month from their sales of herbs and vegetables.

5.1.4.1 The marketing system

At the moment around 15 farmers are involved. Each group (Sedawa, Botshabelo and Turkey) harvests, washes and packs the orders that were listed on the Monday and confirmed by Thursday, on Friday mornings and deliver this to Christina in Sedawa. She travels by taxi to Hoedspruit hub to deliver the produce to Nelson, who inspects and counts it and then pays cash for the produce, according to an invoice produced by MDF.

Checking of quality is made once it is delivered at the Hoedspruit Hub, by Nelson, Betty and Christina. Christina then distributes the monies to each farmer on her return home. This system is working well at the moment, although we are aware that there is not enough of a paper trail. Each farmer is not aware of what they will receive until they are given the cash and this means that opportunities for money going missing are being created. At the moment we are working on a system of management and control that would be appropriate.

The initial agreement with Hoedspruit Hub (HH) was that they would buy all the herbs produced and then sell it on - i.e. they take the risk as the “middleman”. As the farmers have produced a lot more herbs than expected, this process has resulted in a reasonably substantial loss for HH in unsold herbs. This totalled around R8500 by mid- November. For the vegetable sales, it has been based more directly on what can be sold, as the list of available produce, made on a weekly basis, is used to garner orders and on Thursdays farmers are informed how much to harvest and pack. It is likely that the latter process will be used for herbs in the future as well.

5.1.4.2 Changes in the market

- Hoedspruit Hub started working together with Hlokomela, so they can supply Hlokomela with our fresh produce to Lebamba Supermarket. As this is a retail market the prices have now changed from R20 to R10 per bunch of herbs. This tends to create confusion among farmers as it is hard for them to appreciate why they get paid differing amounts every week. Also, for Hlokomela, the herbs do not need to be packaged separately, but can be provided without packets.

Right: Herbs packaged in packets for the veg boxes and other markets and just placed in bunches alongside for the Hlokomela/ Lebamba market.

- Quality is also a major concern, as farmers are not familiar with the standard that Hlokomela will be looking for. Although we have worked with the quality issues on an ongoing basis, the requirements for Lebamba supermarket are slightly more stringent than before, as produce now sits on a shelf, rather than going directly in a box to a customer.
- Delivery dates have also changed, as Hlokomela delivers to Lebamba on Friday mornings, and all fresh produce they will be buying from Hoedspruit Hub have to be weighed again and packaged to be delivered to Lebamba. Thus delivery for the Hlokomela/Lebamba market need to be made to Hoedspruit Hub on Thursdays and not Fridays.





For the first delivery for Hlokomela we had Gavin from Hlokomela checking all the produce, and advising us on harvesting and packaging processes for this new market.

Right: Gavin from Hlokomela showing us how to pick thyme Christina from Sedawa and Anri from Hoedspruit Hub are watching the instructions closely

5.1.4.3 Challenges

- Farmers started complaining about the percentage contribution for transport; most of them think 25% is too much given that we have managed to save close to R1195.30 from the contributed percentage from each farmer who sold their fresh produce. It was decided to decrease the percentage to 15% from the 26/10/2018. This amount that has been saved is used for transport costs on an ongoing basis and there was agreement to ensure that this fund is always kept in the “green”. In November farmers again tried to negotiate the transport price down, now to 10%, this would not be a tenable amount as transport costs a minimum of R300/ week. A different system may need to be considered.
- Another challenge we experiencing is that farmers want to sell, even when they know that the quality of their produce is sub-standard. They want to take a chance just in case. Then, however they become upset when their produce is rejected for sale and this also places pressure on the staff at Hoedspruit Hub, Christina who has to inform them and also the clients who lose trust in the process. Farmers have been informed on many occasions of this difficulty, but continue to chance their luck. The further problem is that for organic produce it is known that small visual defects are more likely and in formal markets this is compensated for by increased pricing of the class A produce and in trying to find alternative markets for the class B produce. This is not really an option for an operation of this small scale.



Right: Picture of a rocket leaf taken during a quality check. There are too many small holes in the leaf for sale purposes. This problem was encountered with all the rocket submitted for sale during that week.





5.1.5 Poultry production training

Two, one day learning workshops were held; one in Turkey (2018/11/20) and one for Sedawa, Mametja, Botshableo, Willows and Fenale (2018/11/21). A total of 86 participants attended these sessions.

Here issues of housing, feeding, poultry health and different breeds were discussed. In addition, the groups went through a budgeting exercise for broilers and layers and different feeding schedules and regimes were presented.

Below small snapshots of the information presented and discussed are outlined.



Feeding Chickens

Chickens are the same as humans; they also need a balanced diet which will allow them to grow to their full potential. Herbs such as Comfrey, Fennel, and Thyme etc play an important role in the diet of the chicken. Grains like sunflower are also needed to balance the diet. But the most important part in chicken feed is the protein which they get from grubs. Grubs are required for body fat and they are a very good source of protein. It's like a full meal e.g. pap, meat and spinach or cabbage.



If hens eat their own eggs, it is a sign that they are not getting the right nutrients, not enough calcium and not enough protein. Although it is recommended that egg shells are crushed and used in the feed, this can actually promote the practices of eating eggs and so grit and seashells are used instead.

Commercial feeds such as grower and finisher are used for broilers and layers. The three- phase feeding that includes post finisher is done to clear out the vaccines and other additives in the feed prior to marketing

For commercial production and working with broilers and layers one has to stick very strictly to the timing and feeding, so that the broilers can be ready after 5 weeks and layers are able to lay on average 1 egg/hen/day. If this is not done, the very small profit margin in poultry production can be lost. It is also advisable to keep at least 100 chickens at a time for commercial production. Working with smaller batches is generally not profitable

Below is a table of costs.

ITEM	COST
100 1st Grade Chicks per box (including ND&IB sprays and chick box)	R 740



2 phase feeding programme 0-21 days starter 22-36 days finisher 37-42 post finisher	R360 x 2=R720 R340 x 5=R1700 R320 x 1=R320
3 phase feeding programme 0-14 days starter 15-36 days grower 37-42 days finisher	R360 x 1=R360 R340 x 3=R1020 R340 x 3=R960 R320 x 1=R320
Drinker	R62 x 3=R186
Feeder Day old	R40 x 3=R120
2 phase feeding	R3046
3 phase feeding	R2966

Housing

Chickens are very sensitive to diseases. They need to be kept in a clean environment and be provided with clean drinking water daily. They also need to be kept warm/cool depending on weather. So rondavels, or shaded areas are a good place to keep them. It is also possible to keep them in moveable arcs or chicken tractors, as this way they can scratch and feed on bugs and also fertilize the soil for you while being moved regularly to a new area that provides food and a clean environment for them. This dramatically reduces the incidence of mites and ticks on poultry

Where do we keep our chickens?





The groups also built chicken tractors as a part of the learning process

Right and far right; Chicken tractors being constructed in turkey and Sedawa respectively.



Chicken tractors of this size can house around 10 chickens. Take care to only have

1 rooster in any one enclosure. If there are more, they compete and may kill chicks that are born.

Health

A session was also spent on discussing poultry diseases and how to control these. The main way of controlling diseases is vaccination. In terms of prevention, one needs to remove sick chickens as soon as possible from the rest, as diseases generally are spread between the birds.

Below is a vaccination chart and schedule - so if day olds or other birds are bought one has to ensure that these vaccinations were done. Some vaccines are added to the drinking water to avoid having to inject the chickens. Vaccinations are important for indigenous chickens as well, even though they are hardly ever done.

AGE	VACCINATION	ROUTE
Day 1	Marek IB/ND Hitchner B1	Subcutaneous Spray
Day 7	ND-IB-MG (Mycoplasma) (0.1ml)	Subcutaneous
Week 3	Gumboro Precise	Water
Week 4	IB H120 Gumboro Precise	Water Water
Week 6	ND la Sota	Spray
Week 7	ND-IB-MG (Mycoplasma) (0.1ml)	Subcutaneous
Week 8	Pox Deworm	Wing Web Water
Week 12	ILT	Eye Drop
Week 14	IB/ND Hitchner B1 Deworm	Spray Water

Breeds



A short discussion on different poultry breeds for different purposes was also done. The advantage of dual-purpose breeds is that they are good meat and egg producers. They are generally slow growing, similar to indigenous breeds, but produce better than traditional poultry and can be a profitable process, especially if feed is produced for them rather than bought.

Dual purpose breeds



Common layer breeds

- Hybrids
 - Golden Comet
 - Rhode Island Red Leghorn
 - Sussex
 - Plymouth Rock



5.1.6 Gardening practices revision workshops

Two workshops were held, one in FEMALE (2018/11/17), with 9 participants and one for Sedawa, Botshabelo and Mamejja (2018/11/16) with 16 participants. The intention of these workshops was to work through practices introduced in previous learning sessions to bring new members on board and to provide a revision for those already in the groups. Issues of implementation and adaptation were also discussed. More experienced group members shared their knowledge and experience with the newer members.

The following agenda was covered in both sessions:

- Bed design (Deep trench beds, tower garden, eco-circle, shallow trench beds)
- Soil fertility measures/ techniques (use of manure, liquid manures and teas)
- Soil movement control measures/ techniques (stone bund, stone lines, diversion furrows)
- Experimentation (this was discussed in relation to experiments involving tunnels)
- Options for field cropping this season (Trying CA)
- Irrigation techniques (use of salty water for irrigation, deep watering, drip irrigation)
- Natural pest and disease control

FEMALE

Below is a summary of some of the points of discussion and adaptations made and suggested by participants:

- Soil erosion control measures have not been used, as there has been little to no rain and participants only do these when they see a need. It was mentioned however that the diversion ditches that were made in the workshops and then planted to sweet potatoes work very well and much better than the furrows and ridges participants are more used to.



- Deep trench beds have been tried by most participants, but due to the shallow and rocky soils in Fenale participants requested different options. Raised beds in this situation make a lot of sense, using the same principles as for deep trenches, but just going up instead of down. It was also discussed that it is not a good idea to just add soil to “sinking” trench beds - there is some settling that occurs over time as the organic matter decays; adding more organic matter is a much better idea than just adding more soil
- Eco-circles, shallow trenches and tower gardens have not been implemented since training and participants needed reminding of how these practices work. Eco-circles do not work well if the crops are planted too far away from the central ‘watering bottle’. Also, the bed needs to start out being very well irrigated, so that the daily or weekly top ups in the bottle can keep the soil moist- otherwise the beds end up drying out. The situation for tower gardens is similar.
- With liquid manures, participants tend to use this as an alternative to other fertility options, even though it is meant to be an additional practice. Using more and fresher manure for making the brews shows a definite improvement.
- A discussion on types and freshness of manure followed - the traditional practice is to use old manure, but there is very little nitrogen or phosphorus in manure that has been exposed to the sun for long periods. The use of fresher manures from kraals that includes urine and also for composting manure was re-introduced.
- Participants remembered the pest and disease control brews well and could introduce those to new members in detail
- Drip irrigation has been tried to good effect by Sarah Nyathi. The water in the area is however salty, leaving a white residue on the drippers that clogs them. Participants asked for an alternative or solution to this problem
- Deep watering was discussed and an experimentation process for this was introduced. Participants still try to do small amounts of watering in the mornings and evenings and try to spread the water across all their beds. This practice is counterproductive and leads to even greater water and heat stress in the plants.
- Even though it is likely that another dry season lies ahead participants were keen to take a chance and do the CA field cropping experiments again. The Fenale participants requested also to try the bird resistant sorghum

SEDAWA, MAMETJA, BOTSHABELO

Here, the workshop was conducted in the Kgwana High School garden at the request of new group members who are part of the Community Work Programme (CWP). Participants(new learning group members) are interested in advancing their knowledge around gardening and finding new ways to improve their gardening techniques. They have attended several combined AgriSI workshops where different gardening techniques were presented but never had a chance at the practical component of the workshop. Currently, CWP environmental monitors use short furrows to irrigate their vegetables (mainly beetroot and spinach). Challenges these participants are facing with the furrows is that they are not level, thus the irrigation is not uniform. They find line level to be very useful and said it will come handy for them when redesigning the furrows. The group was given a practical session on how to measure trench beds, because they were more interested on having trench beds in their gardens, as they have seen the results of planting vegetables on a trench bed from Sedawa local facilitator Christina Thobejane.



Left clockwise: Two views of the CWP garden at Kgwana High School, And Christina giving the team some advice on how to measure a trench bed and they start digging a trench bed.

5.1.7 Innovations and Experimentation

5.1.7.1 Fruit tree orders and deliveries

As a part of the intervention in fruit production in Lepelle, a process was put in place for participants to order grafted trees. Access to good quality trees is very limited in the villages and participants did not know where to find affordable trees. MDF offered to source trees for them. The system is that participants pay R25 towards each tree, which MDF has managed to source. Trees were delivered end October-beginning November for planting and participants were provided with information on best planting options (including fertility and watering)

13 Members of the Lepelle learning group ordered a total of 113 trees between them. The summary table of trees ordered is shown in the small table below. Avocados, pecan nuts and grapefruit could not be sourced for participants, as they were not available at the time. Other trees were sourced from Tzaneen and Letsitele.

Items (Trees)	Quantities
Avocado (<i>fuerte</i>)	7
Mango (<i>Tommy Atkins</i>)	17
Mango (<i>peach</i>)	6
Mango (<i>Sabre</i>)	2
Mango (<i>Keit</i>)	11
Mango (<i>Sensation</i>)	6
Pecan nuts	7
Macadamia nuts	4
Shaddock (grapefruit)	20
Litchi	13
Orange	1
Naartjies	19
Total	79 (113)



The process worked well and all but 4 trees bought for participants have been claimed and paid for. They have paid a total of R2 500 towards these trees. As prices were higher than this, MDF opted to subsidise this process.

5.1.7.2 Report back water issues and borehole assessment survey

LEPELLE

Very little progress has been made in Lepelle, as the water committee has floundered under the political instability caused in the village due to strife caused by lobbying in the area to change the traditional authority and headmen for the area. Community members have not contributed as agreed and thus MDF is unable to take the next step in the process. The agreement was that MDF would match whatever contributions the community made, so that the first steps in renovation of the furrow can be made. No progress has been made in the community to deal with water leakages caused by broken pipes and joins.

SEDAWA

Here Raymond Vonk, a hydrological engineer specialising in borehole surveying (geophysical services), was employed by MDF to do a survey of three potential borehole sites for the Sedawa community (2018/10/07). He produced a report clearly indicating three potential sites along the three lines suggested by the community. This will be reported back to the learning group and water interest group so that the next steps can be taken.



Above: Assessment of Line 2 for borehole options. This line is close to the river in Sedawa and thus also has the greatest possibility of finding a strong source without deep drilling

Suitable sites were found along all three of the lines, although the line close to the mountains above the village, likely would need to have a deeper hole drilled. Mr Vonk suggested the community members find out from others the average depth of drilling for the area. He was unable to conduct his usual electromagnetic survey to access this due to the presence of too many fence lines in the vicinity, which interferes with these measurements. Mr Vonk also offers remote assistance when boreholes are drilled to



access the condition of the rock and slurry being removed, to be able to advice whether the hole should be drilled deeper or not.

TURKEY

In this village learning group members have met independently and decided on a process for saving towards drilling of joint boreholes for agricultural water provision. They have suggested that MDF meets with them once they have collected enough funds to assist them with planning and siting of these boreholes

In addition, Chris Stimie produced a more detailed budget for the two water provision options (reticulation from the mountain spring and the boreholes).

5.1.8 Networking & collaboration

5.1.8.1 LRC Right to Food and Seed Smallholder farmers' workshop - Sedawa (2018/11/07-08)

Around 36 participants attended this session and learnt about the new Seed bills and the potential impact on their traditional seed and seed saving systems.

Discussions included small group discussions on methods of seed saving and types of seed saved by the community members.



5.1.8.2 Agroecology best practise workshop

This networking process was hosted by the University of Mpumalanga and co-organised by AWARD and the LRC (Legal Resource Centre), with input from MDF

The agenda for the session is provided below

Item	Task/ Discussion	Facilitator	time
1.	Arrival and Registration	Gerhard V (UMP) & Bigboy (AWARD)	08:30-09:00
2.	Welcome Remarks	Prof F Kutu (Head of School of Agricultural Science at UMP)	09:00-09:15
3.	Networking and Systemic Social Learning Approach <ul style="list-style-type: none"> Why is this critical? AWARD's experiences 	Dr Sharon Pollard (AWARD Executive Director)	09:15-09:30
4.	Guest Presentation: The Right to Food and Seed Systems (The Seed Bill): Implications for Smallholder farmers in SA <ul style="list-style-type: none"> Overview of the agricultural system in SA and the future of farmer seed systems UPOV & The Seed Treaty explained Implications for seed saving/exchange/sale highlighted 	Busiso Moyo (LRC Researcher) & Linzi Lewis (African Centre for Biodiversity)	09:30-10:30



	<ul style="list-style-type: none"> • Role of CSOs/NGOs discussed & possible way forward mapped out 		
TEA			10:30-11:00
5.	Sharing Best Practices and Lessons Learnt <ul style="list-style-type: none"> • <i>"Developing a decision support system in CSA for smallholder farmers in SA"</i> (Catherine van den Hoof; WITS) • <i>Permaculture Explorers: Seeding Agroecologists from the Ground Up</i> (Becky Harmon; Zingela Ulwazi Trust) 	All (AWARD Chairing)	11:00-11:30
6.	Sharing Best Practices and Lessons Learnt <ul style="list-style-type: none"> • <i>A Meeting of Networks</i> (Lawrence Sisitka et al., Amanzi for Food Project) • <i>Linking herb farmers to markets: Lesson Learnt by Hoedspruit Hub</i> (Betty T. Maimela & Nelson Ngoveni; Hoedspruit Hub) • <i>Vuhehli Climate Smart Agriculture Nursery & Vegetable Project</i> (Linda Ngatshane; Exillite) • <i>Maximizing benefit from water stewardship for emerging farmers, Lesson Learnt about success factors</i> (Mbali Mashele, WWF Nedbank Green Trust Project GT5650) 	All (MDF Chairing)	11:30-13:00
LUNCH		All	13:00-14:00
7.	Sharing Best Practices and Lessons Learnt <ul style="list-style-type: none"> • <i>"Using innovation Systems to define and assess best practice options in CSA"</i> (Erna Kruger; Mathlatini Development Foundation) • <i>Mediating Agroecological learning through Learning Networks</i> (Pesanayi Tichaona; Rhodes University/Amanzi for Food Project) • <i>Bokashi Composting and community Gardening in the United States of America</i> (Penelope Colly & Kathleen Rauch, Seeds of Light) 	All (UMP Chairing)	14:00-15:00
8.	Closing Remarks and Way forward	Dr Cryton Zazu (AWARD)	15:00-15:10
9.	Vote of thanks	Any Volunteer	15:10-15:20

A total of 51 participants from a wide range of organisations, including CBOs, NGOs, tertiary Institutions and Government attended this very informative session. MDF's presentation on citizen science related to water productivity in the gardening experimentation and specifically in the shade tunnels and trench beds, was well received.

The intention of the experimentation process in the communities was to work with smallholder farmers to access the potential impact of these practices, both on production and water use efficiency as well as profitability.

5.2 Success and Challenges in meeting milestone.



Lack of water has restricted activities of farmers even further in this quarter. However, work with tunnels and trench beds has intensified in the communities, despite these difficulties, to the extent that the organic herb and vegetable marketing process has progressed well and even expanded. This initiative points to the huge potential for income generation in the villages if appropriate support and resources can be provided.

Workshops and networking processes have been well attended throughout the period and commitment by the learning group members and their facilitators to this process is impressive.

Handover from Sylvester Selala to the new field worker and supporting intern has gone smoothly, although Sylvester will be greatly missed by the community.

5.3 Monitoring and evaluation

5.3.1 Garden monitoring (October-December 2018)

Garden monitoring has been conducted for around 20 participants in this period. The number is low, as not many participants are active in gardening due to lack of water. Presently only those with access to their own or shared borehole water are still gardening.

This number indicates additional monitoring, i.e. different households to the 29 households monitored in the previous quarter. The number is also lower, as field staffs are spending much more time on organising the logistics around the marketing process and have been involved in a number of trainings and exchange events, limiting days available for the monitoring.

Below are some descriptive photographs of the monitoring done. A full analysis will be conducted again in the next reporting cycle.

TURKEY 1



Garden at Molokane Creche, where two eco-circles were planted, but have subsequently died off due to lack of water.



Mabiletse's tunnel. She has used tree leaves as mulch and is producing well, due to the fact that they have a borehole in their homestead



SEDAWA, MAMETJA and BOTSHABELO



Bigman's farm above Sedawa. He uses drip irrigation and farms vegetables on a large scale ~1,5ha. He uses a water source that "belongs" to him-



Joyce Mafologela's garden in Mametja. She has a household borehole for water access and employs a gardener to assist in vegetable production



Alex Mkgopa's garden in Sedawa. Although he is an enthusiastic gardener, he too has been able to do little without access to water



Miriam Malepe's tunnel in Botshabelo. She has run out of water completely.

5.3.2 Indicators: Assessment December 2018

Figures in the table reflect numbers for the period of reporting, in this case October-December 2018. Some of the information has remained similar in this period, when compared to the July-September period.

Table 6: Summary of indicators assessments for the duration of the AgriSi project: October-December 2018



Indicator	Overall target	Actual December 2018
No of participants in learning groups	120	123
No of learning groups	6-7	6
No of local facilitators	6	4
Percentage of participants engaged in CC adaptation responses	1-2 (45%) 2-3 (25%) >3 (10-15%)	1-2 (10%) 2-3 (50%) >3 (40%)
No of participants experimenting with new innovations -local -co-designed	15% 45%	10% 75%
No of participants showing increased knowledge	35%	72%
Percentage of participants engaged in collaborative activities	35%	44%
Percentage of participants with improved livelihoods -increased availability of food -increased income -increased diversity of activities and livelihoods options	40% 5% 5%	-86% -27% -12%
Qualitative assessments; -Increased understanding and agency to act towards achieving increased resilience - Adaptation and innovations into local context -Potential for increased resilience -Social engagement	See project life change questions	
Stakeholder engagement	Hoedspruit Hub and Hlokomela, Agroecology network members, National Climate Change Committee Stakeholder process,	

5.3.3 Project Life Change Questions:

1. *Do we have examples or stories of how we or others are in the process of adaptive management related to CC? (adapt, reflect and respond to....) and examples of what this adaptive management is?*

In the learning groups concern about access to water has come to the forefront and the members of groups are working on a number of joint strategies to address access to agricultural water for the groups. They have decided to do something themselves rather than wait for Government to provide and have also decided to try and do this together - seeing that individual solutions have limited benefit for others. MDF is providing support in the necessary dialogues and negotiations within the villages and have included participatory video as a way for the learning group members to be heard and also for them to express their thoughts and needs in a coherent fashion.

The small videos have helped a lot inside the villages to open up the discussions, but to date we have not managed to set up viewings with other stakeholders.

Some of the learning group members are making the linkages between organic matter, water holding capacity and evapotranspiration and are adapting practices introduced to still include these principles.



Use of climate information has yet not assisted in decision-making as participants feel they cannot rely on this information and want to try and take a chance on dryland cropping with the hope that they will succeed even in the face of quite overwhelming odds.

Also, they have left the issue of grazing access too late and now have to rely on bringing in feed and hay to keep livestock alive.

2. *Do we have stories that show innovation or lack of innovation towards positive change? What insights have we gained into how innovation can lead to positive change? (INCREASED RESILIENCE)*

There are many examples of small adaptations and innovative changes that participants have made to the practices introduced. One obvious example is that participants have seen the value of micro-climate management (shade netting) in vegetable production under these increasingly dry and hot conditions. A number of participants have extended their gardening areas under shade netting and a few have purchased additional tunnel kits. As this particular innovation is now directly linked to the participants' ability to make a small income from selling organic produce, it is being implemented to various degrees by around 30-40% of the participants

Another adaptive innovation is the building up of trench beds, where digging is difficult due to shallow and rocky soils. Participants have grasped the importance of deep beds with lots of organic matter and have adapted that principle.

Right: Mphelesi Sekgobela's garden (Sedawa). She has extended her garden area under shade netting and also made built up "trench beds" partially under shade of trees as adaptations to allow better production in the hot and dry conditions being experienced in the re



3. *Do we have stories that show evidence of, or an interest in self organisation towards collective action? What insights have we gained into how self-organisation can lead to collective action?*

The members of learning groups that have set up the water committees have actively sought each other out to learn about how these have been set up and how they are working in the different villages. This has meant that in Turkey, which has come on board a little later than Sedawa, they have incorporated some of the learnings from the Sedawa group. A significant learning that they are working with is not to try and organise the whole community into one water committee, but to work with smaller neighbourhood groups of 10-15 families who work together in managing one sources (a spring or borehole) and do the reticulation for themselves. They have learnt that these smaller groups are more coherent and manageable.

Collectively, members from these groups have also entered into discussions with their local authorities to ensure that their initiatives are supported at that level and they have negotiated also with more powerful individuals in their villages who presently hold 'power' over certain water sources and attempted to draw them into the broader process of sharing and managing water resources in their village



The collective action is based around people sorting out their own water problems independent of the municipal and other Government structures, as they no longer trust that these institutions have their interests at heart or have the will to assist them.

4. *Do we have stories to show that learning together is happening or that there is an interest in learning together? What insights have we gained about how to learn together?*

Learning group members value the revision sessions and specifically value the input from other learning group members who have learnt new practices and are implementing them. The confidence of some of the smallholders has grown significantly and with this their will to support and 'tech' others has also grown. They have now suggested that they do these revision sessions regularly among themselves and that they want to set up a network of farmers across the villages of implementation to share information and their experiences.

5.3.4 Work Plan for next period (15 December 2018-12 April 2019).

1. Continuation with water committees and water provision projects in Sedawa and Lepelle - to include a borehole survey in Sedawa, further workshops for planning and collection of contributions from participants, writing of funding proposals by MDF to source co-funding.
2. Continuation of herb and vegetable production for sale through the Hoedspruit Hub partnership process. The next round of seedlings was supplied in mid- November and participants are also growing crops from seed.
3. Continuation of learning sessions; review of S&WC and CSA, for all groups (1 day) - with a focus on more bed design options and also pit composting
4. Conservation Agriculture re-introduction into fields with supplementary irrigation options (Sedawa, Botshabelo, The Oaks, Turkey and including bird resistant sorghum and fodder production
5. Exploration of options to bring more learning groups on board.
6. Further seed saving focus groups - linked to seasonal reviews and planning

6 Overall Progress of Project

6.1 Integration of milestone status.

The table below indicates overall completion of activities according to milestones.

Table 7: Milestone target completion October-December 2018



MAHLATHINI MILESTONE COMPLETION: Completion to date % (in black)							
Key activities / Milestones	MILESTONE 1	MILESTONE 2	MILESTONE 3	MILESTONE 4	MILESTONE 5	MILESTONE 6	MILESTONE 7
Inception report	100% /						
Setting the scene		50%					
<i>New villages, baselines, visioning scenarios</i>		Turkey, CCA workshops, visioning and baseline			New village, CCA workshops, visioning and baseline		
Learning and mentoring		25%	4%	38%			
<i>Learning sessions x 3-5 for ea learning group, value adding activities, mentoring LFs (24 sessions total)</i>		Turkey (3 sessions) Sedawa, Botshabelo, Lepelle (3 sessions)	Botshabelo (1 session);	Turkey (1 session) Mango training (4 sessions) Poultry production (2 sessions), gardening revision(2 sessions),	CA (2 sessions)		
Experimentation & intro to innovations		20%	20%	20%			
<i>Individual experimentation New innovations -seed saving, fodder production etc</i>		2 villages (Turkey, Sedawa)	4 villages Turkey, Sedawa, Botshabelo, MametjaA (tunnels, drip kits, trench beds, herb growing, greywater)	6 villages Turkey, Sedawa, Botshabelo, Mametja, Lepelle, Fenale	6 villages	6 villages	6 villages
Collaborative work		20%	20%	20%			
<i>Joint experimentation on new ideas Collective action RWH, erosion control activities</i>		3 villages (Turkey, Sedawa, Lepelle)	3 villages (Turkey, Sedawa, Lepelle)	3 villages (Turkey, Sedawa, Lepelle)			
Networking and cross visits		15%	15%	30%			
<i>Community level cross visits Stakeholder engagement</i>		-Agroecology network -Hoedspruit hub	-Hoedspruit hub (herb growers-visits to buyers)	-Ukuvuna cross visit -Agroecology best practice workshop			

6.2 Project risk and mitigation summary.

6.2.1 Implementation risks and mitigation

Implementation is proceeding well at this stage, with no further risks identified.

6.2.2 Financial risks and mitigation

The project is on track and is being managed within the budget confines set out.



How productive is each practice?

- Water productivity – how much crop is produced for the amount of water used?
 - Trench in tunnel 10x more than furrows and ridges and 5 x more than trench outside tunnel
 - Must have mulch and do deep watering. If not then result is similar to furrows and ridges...
- Cost- benefit (R35/210l)
 - Profit of R31/m of trench bed (in tunnel)
 - ~R620/tunnel fully planted (15m²), for a season
 - If water is free then~ R900

Name of farmer	Farmers' method (Water applied)		
	water use (m ³)	Total weight (kg)	WP (kg/m ³)
Christina Thobejane (Tunnel; trench beds, with mulch)	1,10	48,9	56,7
Christina Thobejane (Furrows and ridges with mulch)	3,91	24,5	5
Christina trench outside	2,93	14,7	11,3
Nora Mahiako (Tunnel; trench beds without mulch)	9,47	19,6	5

	Water	Cost (R/m ²)	Yield	Sales (Rands/ m ²)	Profit (R/m ²)
Trench inside tunnel	1100	R18,70	6 bundles/m ²	R60	R41,30
Trench outside tunnel	2926	R48,80	4,2 bundles/m ²	R42	-R6,80
Furrows and ridges	3913	R130,40	2,4 bundles/m ²	R24	-R106,40

This presentation was very well received and future collaborations with the CSA Unit for DAFF and the CCA Unit in DEA has been arranged, which would involve designing training processes for DAFF extension staff and collaborating in a monitoring and evaluation framework for CCA through the DEA.