LIMA-SOCIAL EMPLOYMENT FUND (SEF) training, King Cetshwayo

22-24 August 2023

KwaDube Tribal Authortiy, Esikhawnini



Introduction

Climate change continues to reshape rural livelihoods as we've know them, thus it is important that participants be skilled in adapting to the changes brought about increasing temperatures and rainfall variability. Lima Rural Development Foundation has focused efforts into capacitating their supervisors and field staff responsible for ground work in their agricultural programs. These efforts are so that field staff is better equipped to suggest and try out interventions to better cope with the ever changing climate that threaten smallholder agricultural livelihoods. The King Cetshwayo District Municipality; where uMhlathuze and uMlalazi local municipalities are within; were the first of the seven two-day trainings where practical demonstrations of garden interventions as well as nutrition and value adding are done in detail in response to climate change. Prior the two days of training, preparations takes place a day before where trainers see the site, asses and plan out demonstrations to go through with the attendees in supervisors and participants.

Site viewing and preparations.

MDF field staff made their way to Esikhawini Tuesday morning for site viewing and preparations for the Lima- Social Employment Fund (SEF) training. The team was welcomed by Lima facilitators and interns from the UMhlathuze area where the day started with introductions between the teams before viewing the site and preparing for the demonstration stations. The venue used was a tribal court with a big hall, chairs, tables, and electricity. The garden was also in the venue, planted with vegetables on raised beds and a fruit tree. We started with prepping the garden, digging up a 1m diameter eco-circle,

80cm deep, separating the top soil and sub soil. Next to the eco-circle was digging of a trench bed which was 80cm deep, 1m wide and 4m long. A cut-off drain was dug along the end of the garden with the soil dug up placed on the downslope. Mixing of the soil, manure and wood ash for the tower garden was done next, cutting of the banana stem for the enriched foliar spray and digging up zai pits for planting fruit trees. With all the garden preparations done, a quick meeting was held to conclude all the arrangements for the training and this included the starting time, getting more material on site, sorting out catering and checking if all material needed for the trainings is enough and present.



Figure 1: Trainers planning and preparing for the garden demonstrations

Training day 1

The day started with a PowerPoint presentation where we talked through what participants are growing and how they are growing their food. The use of tractors is no longer popular but using hand hoes to loosen the soil, broadcasting kraal manure and planting in seed and or seedlings thereafter is the norm. Kraal manure; as opposed to fertilizer; is continuously added every season in efforts to

maintain soil fertility, however participants question the quality of the manure due to poor grazing lands. Fertilizer prices in shops also continue increase thus forcing focus on livestock for manure as most participants are not employed. Crops grown range from field crops in maize, beans, peanut, sweet potatoes and potatoes with garden occupied by greens such as cabbages, carrots, spinach and beetroots. Small stock in traditional chickens, goats and cattle for some are kept in the household as part of the system.

The group was then asked if they have noticed any changes with regards to their livelihoods and the group was quick to say that rains are falling later and later every season. They do not only fall later but are short and intense in their spells making it hard for them to go " business as usual" in terms of growing their crops. Temperatures are also getting higher year on year, and this puts lots of stress on available water sources as well quality and quantity of crops. This has adverse effects on livestock as well where grazing is reduced due to low availability of grass. The follow up question was asked, what are farmers doing to carry on planting crops and keeping livestock amid rising heat and low chances and short rain occasions. Mulching, keeping smaller herds of livestock, diversifying livelihoods were responses given but no actual practices mentioned. At this point we introduced the weather and climate terms where the group explained weather as daily observations of temperatures, rain, wind and so on to help us plan for the day-to-day activities. Climate is then the observation of daily weather over decades that can be used to study trends and thus help farmers plan their livelihood activities better to adapt to climate change.

Through the PowerPoint presentation we were able to show the impacts these increased temperatures and rainfall variability have on live and livelihoods. Participants in the room mentioned the 2015 drought season, the recent floods in across the Durban area, devastating veld fires in the Western Cape among other. These impacts do not only have repercussions for jobs, schooling, property and infrastructure but also for the millions of smallholder livelihoods across the country. For a lot of farmers and families this translates to no food on the table, no produce to sell, total loss of investment, water borne diseases, increased pest and disease prevalence on crops and livestock. Floods move insects, pests and diseases kilometres and kilometres to new areas where they also multiply as winters are no longer as cold to break the cycle of pests. This is where the five finger principles of climate change adaptation; water management, controlling soil movement, crop management, soil fertility/health and lastly taking care of the environment were introduced. More time was spent on practices to be demonstrated in the garden, the point of using a combination of practices as opposed to isolating a practice was greatly emphasized as practices work better together. The group was split inti three groups were they went and rotated around the garden across the different stations where we had different practices.

Naturla pest and disease control, planting of fruit trees

On arrival of the groups at the station there was a brief discussion where we learned that farmers control pest and diseases using chemicals and how they think those are a quick fix to all their problems; chemicals are costly and poisonous to both humans and beneficial insects in the garden. We looked at the beneficial insects manual and what role each insect plays in the garden. We then looked at the emphasis of using natural control remedies in the garden as they are based on making the best use of systems in nature, help build healthy soil, reduce the ability of pests damaging crops, and also reduce pest numbers.

We then looked at some of the brews that can be used in the garden where a demonstration of the chilli, garlic and onion brews explaining how their strong stinging taste and smell help repel insects like



Figure 2: Showcasing home made concoctions for managing pests and the planting of fruit trees

aphids, mosquitoes, ants, mites, ticks, worms, cutworms etc and also treat some fungi and viruses. After the brews and sharing the handouts we looked at the enriched foliar spray and its role in assisting both the fertility and protection against pest and diseases on crops. We did the foliar spray in a 20l bucket since we couldn't get an open drum. In the bucket we mixed 2 spades of manure, 20l of water, put the banana stem chopping's with 3 spades of green weed, 1l of milk to help with the fermentation process, added 1kg of sugar, 1kg of bonemeal as it contains phosphorus, calcium, and magnesium, 1kg of lime as it contains calcium and magnesium and lastly 2 spades of wood ash. While adding the ingredients we mixed the mixture using a spade. The mixture will then be stored for 10 - 15 days before it can be strained, and the liquid diluted on a 1:5 before application.

Garden layout and practices

The winter season provides a good opportunity to replan and execute water and soil management techniques in the garden. Meticulously moving soil around the garden to slow down or stop and infiltrate water into the soil will be beneficial for reducing soil erosion, increase water infiltration and couple with better soil management to improve soil health and fertility for better quality and quantity crops. Cutoof drains, eco-circles, trench beds, tower gardens and drip kits were demonstrated in attempts to achieve the aforementioned results for the adaptation and improved resilience to shock and stressors as results for increase temperatures, short, erratic and intense rainfall events.

Cut-off drains

A lot of water run down the surface of the garden during the rainy season taking along with it the rich top soil. This causes the loss of healthy soil at the top of the garden that sediments at the bottom of the garden and sometimes escaped the entire garden. A Cut off drain along the top of the garden has great potential in stopping water flowing down the garden, allowing it to infiltrate into the soil, and flow down the slow underneath the surface of the soil. Soil dug out of the drain is put below the drain to create a trickling effect when the drain is full, furthermore this newly created mound can be planted with crops such as sweet potatoes, lemon grass and even vegetables where water is readily available at root zone as it is level with the top of the ditch. Fruit trees can also be planted right below this drain where roots will be able to get enough water.



Figure 3: Nqobile explaining the thinking behind cut-off drains

Trench beds and eco circle

Most participants have worked with trench beds before and currently do have trench beds in their



Figure 4: Participants overlooking the trench before they started layering it back in

garden. For the benefit of the few who had not see trenches it was important to go through the detail as to why the deep trench along with the material stuffed in there. In these trenches organic matter is buried in layers starting with tins and bones at the bottom for iron, phosphorus and other nutrients. These are layered with organic matter, manure and soil and watered until about 15cm above the surface of the soil. This is a concertation of fertility where a variety of crops are planted in this sponge like design that infiltrates and hold water for longer. The three groups were taken through the process but did the practical filling of trenches in stages giving each other turns. In planting the trenches, we talked through the spacing and mixing for crops for variety, efficient use of space, insect pest repellent and water use.

Eco circle

The eco circle is a similar concept in taking out soil and I 1m diameter circle that is filled with layers of organic matter, manure and soil with a 2L bottle with holes on the body planted in the centre of the circle. The idea behind the bottle is to provide water directly at root level of crops to reduce loss of water on the surface of the soil. The planted mix of crops would then be layered with a layer of dry grass to keep soil moist, the grass also decomposes on the surface putting in more organic matter in the soil.



Figure 5. Eco-circle filtery pluffled by the groups

As part of the intensive homestead food production training, a tower garden demonstration was made for the Lima trainees, a tower garden is a vertical garden that is suitable for people with little spaces for planting, as it does not take much space. These types of gardens are suitable for elderly people and disabled people as they do not require much labour once they have been constructed and use local resources for construction. To construct, a tower garden needs soil, dry manure, wood ash, four 1.8m wooden poles or standards, 80% shade cloth to hold the soil, a 5 litre bucket and stones to create a stone column in the middle of the garden.

A 3-meter tower garden was constructed, using two bags of manure, one of wood ash mixed with 3 bags of soil. Wood ash was added to raise the pH and lower the acid in the soil and clean grey water if used. The trainees were seperated into 3 groups, we started building the tower garden with the first group, a 5 litre bucket, with a cut out bottom was placed on the ground in the middle of the tower/poles and filled with stones, the mixed soil was added around the bucket, making sure the net remain straight with no corners, the bucket was moved up leaving crush stones from the boom until the top of the tower creating a stone column, with mixed soil around it. The crush stones are for watering the tower garden, as it allows the use of grey water (used, soapie water from doing dishes,



Figure 6: Participants building a tower garden from scratch

washing or bathing), the crush filters out the sediments in water and allows the water to be distributed amongst the tower, from top to bottom. The ash would also help to settle out soup in the grey water.

One more layer of crush and stones was added in the tower garden for the second group to see, then the tower was complete, we then started planting two sides of the tower by openning small holes that fit one or two fingers on the sides of the shade cloth in a zig-zag pattern, to prevent the vegetables from shading each other and in case the shade cloth starts tearing down from one hole, it will not tear too much and let the soil out. The vegetables were mix cropped, making sure there are some herbs in each side, Inter-cropping was encouraged to create a natural pest deterrent, herbs for consumption and to repel insects with their scents.

The third group planted the remaining two sides of the tower, and the top part, then watered the garden using two 20L buckets of water. An emphasize of which crops are to be planted on the sides and on top was made to the trainees, only leafy vegetables that do not grow underground are to be planted on the sides of the garden, like spinach, Chinese cabbage, herbs, spring onion, etc. on top, beetroots, lettuce, and the leafy vegetables were planted, as they would tear up the cloth when harvest if planted on the sides. Some of the trainees felt that the tower garden making requires too much labour, some felt it was easy to manage and a great way to save space.



Figure 7: Planting of the tower garden

Drip kits



Figure 8: Testing out drip kit with all three groups as closure and wrap up of garden demonstration

Water continues to be an everyday challenge for South African and it is important that we use every drop wisely. Greywater can play a vital role is stretching the little available water we have where sand a sieve remove dirt before water makes it way down the pipes. Furthermore, drip kits can make more efficient use of that water by continuously availing little drops of water over long periods of time. Water is provided directly to crop roots slowly but surely translating to better water productivity. This session was used as a wrap up where the three groups came back together to wrap up the three station and providing synergies across the different practices.

Training day 2

Nutrition and value adding

Discussions in the nutrition session were mostly focused on acquiring what the Lima participants already know about nutrition and expanding their knowledge on it. Their understanding of nutrition was basically a combination of healthy foods and nutrients. It was further explained by the facilitator that nutrition can also be described as a process of converting the food consumed to energy, and other vital nutrients required by the human body. The presentation then further unpacked the importance of consuming nutritious foods for both children and old people which is to, improve well-being, and the ability to fight off illness and to also recover from it, protect the human body from chronic diseases such as heart diseases, diabetes, and cancer. We discussed the major groups of nutrition which are carbohydrates, proteins, fats, vitamins, minerals, dietary fibre, and water. We had discussions on the different roles that these different groups of nutrients play in the human body and in which foods we can find them in. We then explored the participants' general diets where they all had the chance to say what they eat daily.

Table 1: Foods and drinks that the participants generally eat

Bread	Tin fish
Porridge	Eggs
Uphuthu	> Beans
Rice	Sausages
Steam bread	> Cereal
Samp	Sour milk
Chicken	Cabbage
Tripe	Butternut
Fat cakes	Cheese
Spinach	Bacon
Fried chips	Beetroot
➢ tea	> Juice
	Alcoholic beverages

We then had two participants who specifically listed what they ate the past two days (this was inclusive of their breakfast, lunch and supper).

Table 2: Specific previous meals from participants

Sduduzo (male)	Londi (female)
Monday	Monday
Breakfast	Breakfast
Porridge and lemon	weetbix, water, milk, and sugar
Brunch	Lunch
Fatcakes and polony	apple, nartjie, and water
Lunch	supper
Uphuthu, cabbage, and chicken feet	chicken, rice, butternut, and water
Supper	
➤ Tea	
	Tuesday
Tuesday	Breakfast
Breakfast	3 scones and aquelle
Fat cakes and polony	Brunch
Fried chicken and bread	Gizzards, bread, and cool drink
Lunch	Lunch
Beans and rice	Wings, fried chips, and bread
Supper	Supper
➤ water	Uphuthu, spinach, and water.

The purpose of these two activities was to run the group through the different nutrients that the food they eat provides for them. After the discussions they were able to see which foods provides carbohydrates, proteins, fats, fibre, and vitamins. Through this activity the participants now knew which food should be in their diet and the amount of that food they should consume to maintain a healthy diet. Participants were then taken through the 3 different food groups which are Go, Glow, and Grow foods. These food groups were further broken down into simple terms because the participants did not know about these food groups. Go food group gives the body heat and energy and amongst them we can include foods such as potatoes, cereal, bread, avocado, bananas, and a whole lot more which were included in the handout participants took. We then moved on to discuss the Grow foods group which repairs and builds our body cells and listed a few foods that are considered grow foods

which are chicken, beans, fish, eggs, etc. Lastly, we moved on to the glow food group which regulates and protect our bodies, glow foods include fruits and vegetables, and drinking lots of water.

After the food group discussion, there was a short activity whereby the participants were divided into three groups and the first group had to propose a meal/full plate for a healthy grown adult, the second group had to propose a meal for a sick adult, and the last group had to propose a meal for a developing child. The meals had to clearly be inclusive of go, grow and glow foods. The three proposed meals were as follows.

A healt	thy grown adult	A sick a	grown adult		A developing child Lunch		
Lunch		Breakfa	ast				
\succ	Mashed potatoes and	\succ	Porridge an	d milk	\succ	Spinach	
	sweet corn	\succ	Oats		\succ	Boiled chicken	
\succ	Fish	\checkmark	Sweet	potatoes	\succ	Mashed potatoes	
\succ	Carrots		(mashed)		\succ	Juice	
\succ	water	Lunch					
Snack		\succ	Uphuthu ar	nd potatoes			
\succ	Protein shake	\succ	Water				
\succ	banana	\succ	fish				
		Supper					
		\succ	Spinach				
		\succ	Beetroot				
		\succ	Butternut				
		\succ	Liver				
		\checkmark	Carrots				
		Snack					
		\succ	Banana and	l apples			

Table 3: Plate designs by participants for a healthy adult, a sick person and a toddler

After this activity, the teams rated which meal was the most nutritious and included go, grow, and glow foods. The meal proposed for a sick adult was rated the most nutritious as it included go, grow, and glow foods, but mostly had grow foods which repairs and builds up our body cells. After the



Figure 9: Groups presenting their plate designs and discussion on their choices

presentation, participants were confident in that they understand the importance of a well-balanced and nutritious diet and the different food groups and the purposes they serve in the human body.

Value adding

The value adding session comprised of three stations of different processed food. The stations were headed by the MDF team. The three stations were as follows:

Table 4: value adding stations and team members

Station 1	Station 2	Station 3
(Noxolo and Mazwi)	(Nqobile and Hlengiwe)	(Lungelo and Sphumelelo)
 Sweet potato bites Blanching and drying 	JamSweet chillies sauce	PestoAchar

The three groups of participants all had a chance to visit the three different stations where they were taken through the activity. The team clearly explained the process of value adding, and its importance. We then moved on to the different methods of making the processed food in the stations, and the nutritional value found in the product. Participants found much interest in the drying and blanching of vegetables since they experience problems with rotting of vegetables before they could use them, and they would try out this process. Questions were around which vegetables they can blanch, and how long the vegetables can stay after blanching. The participants were given hand-outs to go try out the different recipes in their homes.



Figure 10: Blanching and sweet potato bites with groups



Figure 11: Nqobile and Hlengiwe doing jam and sweet chilli sauce



Figure 12: Achar and pesto in the making with groups awaiting to taste

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