Training of Trainers (ToT): Garden training workshop

Venue: KwaDapha Hub

Date: 23 August 2024

Times: 09:00

Introduction

Agriculture is one of the main livelihoods which the community of KwaDapha cherish and make a living from and is mainly subsistence. The community members have livestock such as goats and some have cattle. Majority of the community have gardens in their homesteads where they plant vegetables, some of the fields crops such as beans and nuts, and they have fruit trees within their households. The aim of this workshop was to provide a garden training to the YES intern youth group who are stationed at KwaDapha Hub, this training will equip the Interns with the necessary set of skills, knowledge and bit of technical know-how to help smallholder farmers within the community to improve their agricultural standing through new agricultural practices seeking to increase resilience to climate change and are environmental sensitive.

The workshop was divided into four sessions, the first session was an activity for the YES intern. They were requested to come up with the garden layout they know in their communities, draw them on the flip charts provided and present them afterward. The second session was a discussion on garden layout focusing on aspect, slope, wind as well as water and soil management. The third session focused on living soils, which focused on soil structure, soil fertility and practical practices seeking to increase fertility in the soil for better crop performance.

Current garden drawing presentations

The YES interns were divided into three groups where they were requested to come up with a garden layout they knew of. In this exercise the groups were asked to draw a garden they all new or from one of their homes and were grouped into their communities they come from, these drawings were to include types of crops planted in the garden, where they get water for irrigation, types of practices involved in the garden. Then were also asked to give details on their layout on garden slope, aspect, water pathways after heavy rains and wind direction. One individual; Mqondisi; was asked to do his layout alone and the reason behind that was the fact the has his own garden on a bit of a larger scale where he grows for both eating and selling. Afterwards that they were asked to appoint one member to present their layout on behalf of the entire group. The main purpose of this exercise was to get to know some of the activities practised in this area in details, but most importantly to pick up what the YES intern understands about gardening in general.

Figure 1: KwaDapha group presentation of current farming practices

Presentations done were from the KwaDapha, Nkathweni, Emasakeni and Mvutshana communities. According to the presentation and the drawings in their chat, most crops planted were carrots, spinach and cassava and they were all mono crops. The farmers are struggling in water access however they managed to get water irrigation from water stored in JOJO tanks (rainwater) and some have boreholes in their households. One common technique or practice in obtaining water is, farmers would dig a few metres down at any spot at the garden or cropping field and water would come out from the shallow water tables and this is a practice in all communities. Another

advantage is the fact that the gardens are surrounded by trees meaning they are hidden from strong winds. And most areas are not steep, hence the municipality's name "Umhlabuyalingana" meaning flatlands, so surface run-off is hardly an issue in this area. Wild animals like monkeys and hippos are a huge challenge for the farmers.

Figure 2: Emasakeni village garden presentation

From the presentations, farmers generally buy seeds and do their own seedlings which they transplant in the bigger plots fences with branches, nets and iron sheets. These seedlings are produced closer to tall trees under shade and watered. Birds are a huge problem as gardens are done in between natural vegetation and tress, scarecrwos are a practice in Nkathweni and they seem to be deterring some birds, however, there has been an increase in birds camping in garden and fields where participants in other villages stay out in the day chasing them away. Kraal manure from cattle and gats are common fertility amendment used when growing food where it is mixed with the soil before planting. Compost pits are also common, where organic matter is plied in a pit and used at the base of the basins when seedlings are transplanted. Some villages are exposed to pesticides and use pyrethroid based products to treat aphids on cabbages and other leafy crops. Mqondisi in Mvutshana has access to and uses synthetic fertilizers for his cash crops such as chillies and leafy greens. Interns did bring across that crop selection also was influenced by water available in the wetlands area where they normally do their gardens. Crops such as cabbages, amadumbe, banana and carrots are planted in moist areas where these crops can flourish more as to opposed to maize for example which doesn't like too much water.

Mqondisi has been experimenting with summer cover crops in sunnhemps that he is growing to replenish his soils with organic matter and nutrients. He saves seed from his sunnhemp to plant the following season and rotates his sunnhemp with chillies and vegetables. His plots never run dry as he has borehole water that he pumps to a tank and irrigates using sprinklers when it gets too hot.

Garden layout and design

This section was a discussion which was facilitated by Nqobile Mbokazi where he started by the garden layout which the YES interns were not aware of. Here he was putting emphasis that gardens are not just made anywhere but careful consideration of aspect, north and south facing slopes, must be looked at. Aspect has an impact on the performance of crops as the north facing slops is known to be the warmest, this

Figure 3: Nqobile talking to aspect, wind, sun and slope to the group

is because when the sun rise in the morning, this aspect is the first to receive the sunlight, and during the afternoon when the sunlight is intense it is also the first to receive shade. While the South Facing slope is the opposite of the North facing slope. So, it is preferable to establish your garden in the North facing slope. Wind is another important factor as it has the potential to dry out soils. So, the garden must be protected from heavy destructive winds that will damage crops. If not protected by buildings, gardens need a buffer in trees and shrubs that will reduce the impact of the wind before getting to the garden. Yes, plants do need air, but winds can eat away crops slowly like sandpaper if exposed.

The second factor which the farmer should also be mindful of is water management, there are two events which can take place as far as water is concerned, the first one being too much water in the yard of the farmer. This means if the farmer has a sloped area which encourages surface run-off on the area, it is significant to know the collection points of the water during rainfall and its direction. There are practices which can help the farmer to manage the situation of too much water in the yard, such as cut-off ditches and diversion furrows. Farmers cannot have gardens where water collects and sists nor do they want it at the driest part of the area. So somewhere in the middle where run off can be either be slowed down or stopped thus encouraging more infiltration and access to crops thereafter. Cut off drain and diversion ditches are physical alterations of the landscape and management tools farmers can implement to control the water and channel it somewhere useful. The steepness of the slops has great influence of the speed of water and its soil eroding capacity and this is crucial for the sustainability of farming.

Living soils

This section was a discussion about soil management facilitated by Mazwi Dlamini. A question posed by the facilitator: Why do we use fertilizers to the soil? Most of the YES youth answered by saying “We use fertilizers as means of trying to produce food” and some answered by saying “To enrich the soil because of the situation were plants just dies”. Mazwi responded by saying that fertilizers are a temporary fix and not a permanent solution to the poor soil fertility problem. Fertilizers are rather like pills which are like vitamins that offers a temporal solution for specific deficiencies but does not solve the problem in the soil. Soil ailments are a result of “mining” practices where farmers farm without replenishing nutrients back and they eventually run low and run out. Much like unhealthy eating habits in human, coupled with excessive drinking and lack of exercise, the body with not cope with threats thus making the person prone to falling sick. Sound practices such as minimal disturbance, permanent soils cover for organic matter and rotations keep the soil healthy thus crops perform well. Then he continues by sharing the concept of the living soils, the soil is has life, it needs different kinds of nutrients to stay alive, it needs water to survive and it also needs oxygen, nitrogen for healthy leaves and stems, phosphorus for strong health roots and potassium for lowering and bearing fruit, this lead to the NPK discussion that farmers buy in fertilizers. It is a farmer’s responsibility to take care of the soil by making sure that all its needs are met so that the soil will take care of the farmer, healthy soils can be identified through good organic matter and presence of living organisms in it such as earthworms. Healthy soil has good structure and are able to hold water thus reduce run off.

Figure 4: Discussion on living soils by Mazwi Dlamini

There are three major nutrient which are observed when looking at the soil fertility, they are Nitrogen, Phosphorus and Potassium (NPK). This does not mean that they soil only needs these three nutrients, there are other nutrients needed by the soil which are significant as well, however these three nutrients just have more seen results which are easily detected. For Example, Nitrogen is seen on the leaves of the plants, if the plant has insufficient nitrogen leaves turn yellow or brown. Phosphorus provides the plant with good root system and strong stem and when the plant lacks phosphorus the leaves turn fiery red at the edge of the leaves. Potassium helps the tree to produce and bear fruit and flowers.

There are organic ways to supplement these major nutrients in the soil without the use of synthesised chemicals or nutrients. Cattle manure, Chicken manure, rabbit manure, planting of legumes and cover crops can supplement Nitrogen in the soil. Bones, bone meal, comfrey, chicken manure and wood ash can supplement Phosphorus and Potassium. A question from the YES group: “If pig manure also recommended”. Mazwi: “ideally pigs do have a lot of nutrients in their by product or manure, but the issue is pig usually have a lot of diseases detected from them which end up being easily transferred to humans as well, so there are lot of complicated procedures which are to be followed when dealing with pigs in general”

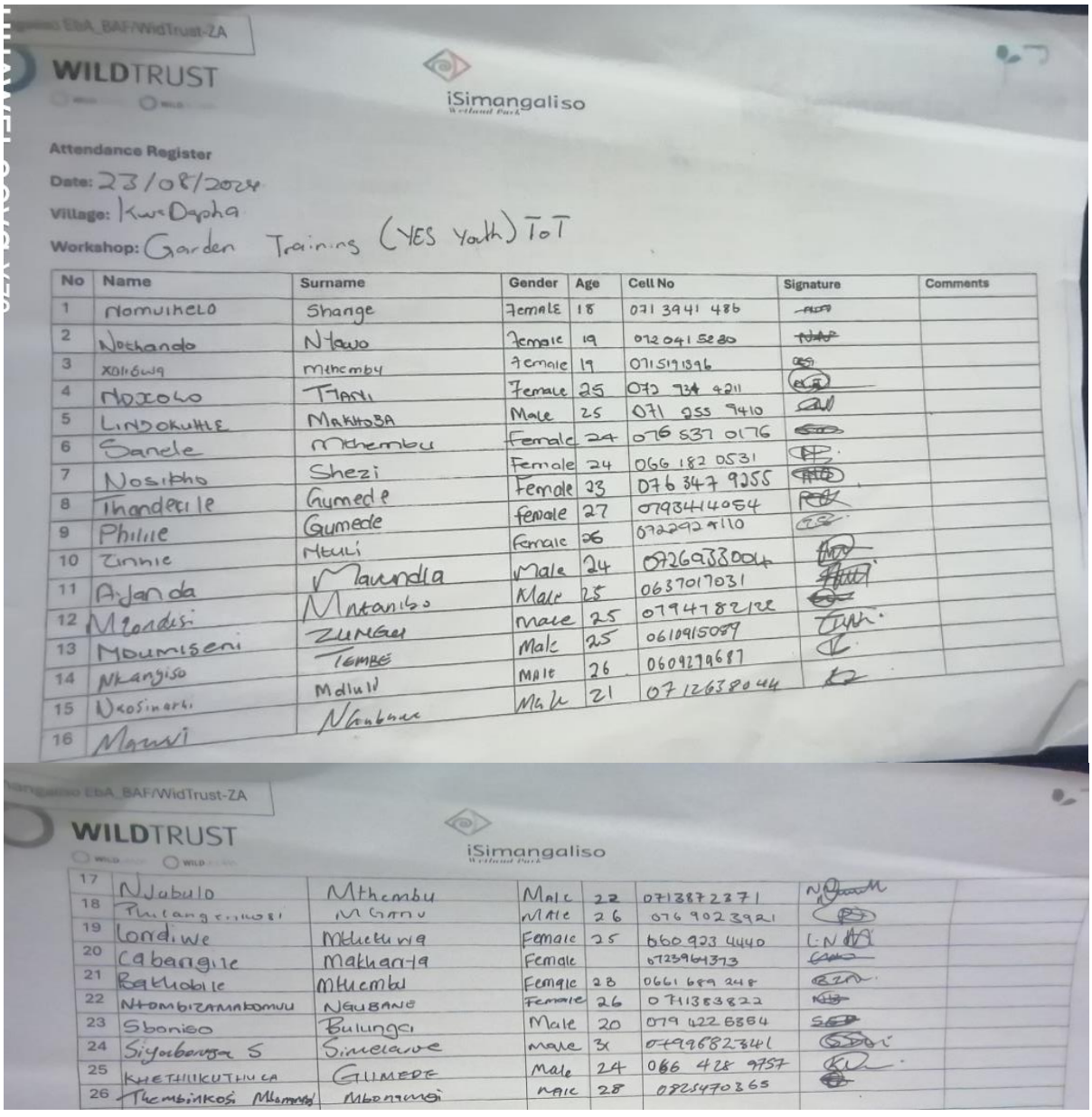
Acidity

Soil can also be found to be acidic which also one of the factors which cause the soil to be unproductive. The PH of the soil should be always neutral which is represented by 7 in the PH scale. PH of 6.5 or 7.5 is also preferable not less, and not more. Acidity is usually caused by excessive application of fertilizers and can be neutralised by

liming. Soils can be healthy and acidic, thus making nutrients in the soil unavailable to crops leading to stunted growth.

Conclusion

A lot of information was shared in one day and the day was quite long, the YES had a lot to digest and reflect on. The training went well, the Interns participated and 30 manuals were distributed to the group for them to revisit these discussions, these manuals are also now their “bible” as far as intensive homestead production is concerned and will provide them with guides in assisting the greater community.



WILDTRUST

iSimangaliso Wetland Park

Attendance Register

Date: 23/08/2024

Village: KwaDapha

Workshop: Garden Trainings (YES Youth) ToT

No	Name	Surname	Gender	Age	Cell No	Signature	Comments
1	Nomuhle	Shange	Female	18	071 3941 486		
2	Nothando	Ntawo	Female	19	072 041 5280		
3	Xolisiwe	Mthembu	Female	19	0715191396		
4	Nozuko	Tlaki	Female	25	072 734 4211		
5	Lindokuhle	Makhoba	Male	25	071 955 9410		
6	Sanele	Mthembu	Female	24	076 537 0176		
7	Nosipho	Shezi	Female	24	066 182 0531		
8	Thandekile	Gumede	Female	23	076 347 9255		
9	Philile	Gumede	female	27	0793414054		
10	Zinhle	Mkuli	Female	26	0722927110		
11	Ayanda	Maundla	Male	24	0726938004		
12	Mondisi	Mntambo	Male	25	0637017031		
13	Mduduzeni	Zulu	male	25	0794782122		
14	Nkanyiso	Tembe	Male	25	0610915089		
15	Nkosinathi	Mdlalo	Male	26	0609279687		
16	Mavusi	Ngubane	Male	21	0712638044		
17	Njabulo	Mthembu	Male	22	0713872271		
18	Thulani	Mthembu	Male	26	076 902 3921		
19	Londiwe	Mkhwanazi	Female	25	060 923 4440		
20	Cabangile	Makhanya	Female		0725964373		
21	Bekhokile	Mthembu	Female	28	0661 689 248		
22	Ntombizamakhosi	Ngubane	Female	26	0711383822		
23	Sbonelo	Bulunga	Male	20	079 422 6864		
24	Siyabonga S	Sinegave	male	3x	0749682341		
25	Khethukuthula	Gumede	Male	24	066 428 9757		
26	Thembinkosi	Mbongwa	male	28	0825470365		

Day 2: Practical demonstration of practices

This was a demonstration day demonstrating where the group was going to put into practice what was discussed the previous day. The day would be an a collection of practices for improved gardening where water, soil, diversification, greywater and intensified production would be exemplified. A construction of a micro tunnel, with trenches filled with organic matter and drip irrigation along with a tower garden making use of a small space to grow food enough for a household while using grey water to somewhar relieve demand for water to irrigate crops were to worked with and shown in detail to the group for them to be able to help implement these in the community. All preparations of the demonstration were done prior to this day, where most of the required materials such as manure, and dry matter were collected and kept at the demonstration site.

Most of the YES interns seemed to have forgotten the CRA practices discussion and some information on the micro-tunnel and tower garden. A summary and a reminder of the CRA practices specifically the micro tunnel and a Tower Garden was shared with the youth group. The first demonstration was the micro-tunnel where we started by measuring the site where a tunnel was appointed, the measurement being 6m X 4m which are the measurement of the tunnel. The second step was digging up the deep trenches with the measurement of 1metre width 5 metres length and 1 metre depth, the YES group were given an opportunity to measure and dig all three trenches under supervision of MDF stuff members.

Figure 5: The how and why of trench beds

Trench beds were filled up by adding dry matter and manure creating layers on the trenches from bottom until just above ground level. The first layer of the trenches is supposed to have tins and bone, adding calcium and zinc in the soil, however these materials were not found during this demonstration and thus bonemeal was spread. Next was demonstrating the bending of the steel-poles using a jig and joining the two-bent poles through a coupling creating one ark shaped pole which makes the shape of a tunnel, then the youth were given an opportunity to bed the rest of the poles and joined them using joints. The back of the tunnel and the front of the shade tunnel structure were sown in using the poles and the net with field staff demonstrating this and handing over to the group to try out.

Figure 6: Demonstration and bending of pipes by the group ahead of tunnel construction

After the back and the front of the tunnel were created and all the poles were joint, the following step was to install the poles to the ground. A huge disadvantage in this demonstration site is the fact that the soil or the ground is very sandy with loose particles making it difficult for the poles to stand strong in the ground. Having this knowledge before time was a real game changer to this situation as we have planned for it. The plan was to make concrete and hold it using 5Litre bottles then make a 14 cm deep hole at the centre of the bottle which is a perfect size of the steel-pole, the idea was to use this concrete as an anchor of the steel-poles giving the tunnel strength to stand still underground.

After the poles have been grounded strong to the ground, the last piece of the net went over the poles and sewed to the pole starting from the top of the pole to the bottom

covering and completing the tunnel. Upon finishing the tunnel a sense of pride filled the atmosphere as the YES youth were so excited and proud of their efforts. After the tunnel was completed, 120 seedlings were planted on the trench beds (kale, mustard, spinach, chinese cabbage, brinjal, thyme, coriander, parsley, chillies and onions). Particular attention was given to how the seedlings were combined where we looked at leafy crops, bulbing crops as well as herbs. It important to have a diversity of crops in your beds where onions, chillies, parsley, thyme and coriander can protect greens liked by pests. The diversity in the garden makes it difficult for pests to "target" spinach, cabbages and other vegetables. The different crops also use different nutrients and have different water requirements thus reducing competition. Farmers also have a variety of crops to choose from thus increasing intake of various nutrient with herbs such as parsley aiding in blood pressure reduction while thyme help fight off bacterial and fungal infections. Lastly, drip irrigation system; prepared by the YES group were also demonstrated and installed in the tunnel.

Figure 7: Putting together drip kits from scratch and lining them on beds

Tower garden

During the climate change workshop, a tower garden was demonstrated on one of the homesteads in the community. The Yes Youth was present during the demonstration, this time the tower garden was to be installed at the community hub it was a chance for the YES youth to show how much they remembered. They started by mixing cattle manure with the soil because they had already sewed the net together. They then used a five-litre bottle cutting its top and bottom leaving the body of the bottle throughout.

The hollow bottle was used to make the stone column in the centre of this garden held by the soil-manure and wood ash mix. This process was repeated until the garden stood tall and was planted in the body and at the top. However, they had forgotten the guideline for using grey water in the tower which is like the drip irrigation system as well. They were then reminded that grey water is not used right after being used, but it must first be kept in a drum with wood ash added to flush out the soap and chemical

and neutralise before it can be provided to crops. Importantly, crops do need fresh clean water once a week to wash themselves of the greywater.

Figure 8: Planting the tower garden