



Garden Farming Action Group Program Manual



Child Aid ZAMFAM South Central



Introduction

The Zambia Family South-Central Activity (ZAMFAM South Central) is a five-year project being implemented by Development Aid from People to People in Zambia (DAPP) with the sub-partners Creative, KAFHI and NZP+ and with funding and technical support from the American People through USAID/Zambia.

The overall goal of the project is to improve the care and resilience of vulnerable children in Southern and Central Provinces by supporting, protecting and strengthening the capacity of children, families and communities. The goal will be reached by directly involving the children, youth, families, caregivers, community groups and government structures. Activities for children and adolescents living with, affected by and/or vulnerable to HIV, are aligned to the following 4 results:

- Resilience of households to care for children and adolescents increased.
- Child wellbeing status improved due to provision and accessing of quality care and support services.
- Capacity of government and community structures to care for and support children and adolescents increased.
- Strengthen shared learning.

Activities will be implemented in close cooperation with Government Line Ministries and Institutions, Civil Society Organizations, Faith Based Organization and community structures such as Community Welfare Assistant Committees, Village Action Groups, Support Groups for People living with HIV and Youth Clubs.

ZAMFAM South Central will demonstrate the power of Zambians to create change for themselves.

This guide has been designed for the Garden Farming Action Groups to carry out the 10 months program.

This booklet contains monthly headlines and content for each of the weekly meetings.

It has been designed to be easy to use for the Garden Farming Action Groups, the Garden Farming Action Group coordinators and the project staff who are assisting the clubs.

This guide was made possible with support from the American People delivered through the U.S. Agency for International Development (USAID). The contents are the responsibility of Development Aid from People to People and do not necessarily reflect the opinion of USAID or the U.S. Government.

Garden Farming Action Groups – The year at a glance

MONTH 1

Getting started with garden farming

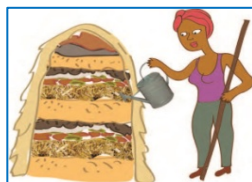


Lessons & Actions

Welcome to the Garden Farming Action Group
Healthy food for the orphaned children
We start preparing our garden farm nursery
We make the nursery

MONTH 2

Preparing the soil for our gardens



Lessons & Actions

We learn about healthy soil
We make compost
We fence the gardens
We clear the land

MONTH 3

Planning for growing healthy vegetables



Lessons & Actions

Making the plan for the garden
We prepare the soil for planting
We transplant the seedlings
We plant and sow

MONTH 4

All families have a backyard garden



Lessons & Actions

All families have a backyard garden
We water the garden
Weeding and scouting for insects
We visit the family backyard gardens

MONTH 5

Our first harvest



Lessons & Actions

We learn about harvesting and storing
We harvest the first vegetables
We make good storings systems
We prepare to use our own seeds and plants

MONTH 6

Second round of planning



Lessons & Actions

We learn about malnutrition
We plan to have vegetables all year
What we take out of the soil, we replace
We plant and sow the second round

MONTH 7

Taking care of the garden farm



Lessons & Actions

We learn about managing challenges
We expand the nursery and use our own seeds
We help the plants to grow
Our soil is covered all the time

MONTH 8

Getting wiser and using our experiences



Lessons & Actions

We celebrate our garden farm results
We make friends with good insects
We plant flowers to attract bees
Nutrition and HIV/AIDS and TB

MONTH 9

Harvesting, preserving and storing



Lessons & Actions

We learn about good foods and bad foods
We cook in a way that preserves nutrients
We share systems for storing vegetables
We share methods for preserving vegetables

MONTH 10

Selling vegetables



Lessons & Actions

How to sell a produce
We plan for the sale of vegetables
We prepare our own Farmers' Market
Selling healthy food to our neighbors



The Garden Farming Action Group Program Manual

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Program Manual for Garden Farming Action Groups

Introduction

Dear member of the Garden Farming Action Group

Zambia has one million four hundred thousand orphan children. This is a huge number in a total population of 15.8 million people.

Your own family, or your neighboring families are among those who are caring for a number of these orphans, and the Action Groups are formed for you to be able to help each other with the task.

The Program Manual for the Garden Farming Action Groups will assist you to get started with garden farming and in this way be able to produce food for the orphans, as well as for the whole family.

Some of you might already have a garden. Others will start a garden for the first time. The idea of starting Garden Farming Action Groups is to be able to produce more food, and to use the available knowledge on how to produce food in a sustainable manner. Some of you might also be able to produce food for sale, and in this way earn some extra money for school fees and clothes.

While working through the Program Manual you will learn “How to do” it and why it is important for children to get healthy and varied food while they are growing.

The Garden Farming Action Group Program Manual, covers the activities of the Action Group for 10 months. Each month has its headline and plans for 4 lessons and actions, each with an introduction, and an instruction in what to do in the garden.

The life and work of a Garden Farming Action Group

Each group is constituted by members from 10-20 families.

The group will choose two coordinators.

There will be a meeting every week for 3 to 4 hours with a lesson and an action.

The Garden Farming Action Group will make a common garden on some land provided by the village. The harvest will be given to families with orphaned children in need.

Each family will also make their own garden, a backyard garden or a garden close to the available water source, depending on what is the best option.

In the weekly meetings, the group will use the Garden Farming Program Manual to get introduction to the weeks' topic and the action to take together. There is also a description of "homework" to be done in the family garden, and a list of preparations to be made for the next meeting and action.

The two coordinators will prepare the monthly lessons assisted by the Community Mobilizer and the Project leader.

Once a month, the Garden Farming Action Group will have a visit from the project staff, - either the Community Mobilizer or the Project leader. He will give the lesson of the week, and assist the club coordinators on how to prepare the lessons and actions for the next 3 weeks.

As a member of a Garden Farming Action Group, you will take part in:

- Creating better conditions for the orphan children and your own children to grow up in, by making sure that they eat well, do not get sick, and are supported in their social, intellectual and emotional development.
- Making backyard gardens or small garden farms to grow healthy foods.
- Making use of locally available healthy foods.
- Using new methods of cooking nutritious meals.
- Supporting each other in the clubs.
- Sharing knowledge on how to do garden farming with your neighbors and other people in the community.
- Taking actions with the other families and in the community to improve nutrition, teaching, health, hygiene and sanitation.

Welcome to the Garden Farming Manual



**for Garden Farming Action Groups in
Child Aid ZamFam**

Month 1

Getting started with garden farming

Week 1 - Welcome to the Garden Farming Action Group

Lesson: Presentation of the program

This action group is formed with the aim of your families being able to take better care of the orphan children and of the whole family, especially when it comes to food.

The idea is that your group will make a common garden where all the group members will work together on producing food, while learning how to do it. At the same time, each of you will make a back yard garden or a small garden farm, where your family will produce food to improve your food security.

In this way, each family can produce food without using much money. You can also produce better food, because with homegrown food it is possible to use good farming methods, and avoid using chemicals and poisons, which are usually used to produce the food you can buy in the supermarkets, and even in the open markets.

Expect to learn more about what it means when food is healthy, and to learn new methods of growing vegetables in a sustainable manner.



The orphan children are now staying with you because they have lost their parents. Even though your family has decided to take good care of them, it can be very difficult to secure enough of everything to raise an extra child.

This is why the Garden Farming Action Group will work together in helping each other with the task.

The children in the families should also be involved, both the orphan children and your own children. Children have a lot of energy. They like to learn, and they like to do something that is important for the whole family.



You will start by going to the headman, to get consent from him to help with finding a plot for the common garden.

A plot for the common garden should be about $10\text{ m} \times 15\text{ m} = 150\text{ m}^2$. It should be arable land without big trees, and there has to be water nearby.

A garden of 150 m^2 will need 30-40 buckets of water every day.

Each family back yard garden or garden farm can in the beginning be $10\text{ m} \times 5\text{ m} = 50\text{ m}^2$, or of any size that is available at the homestead or nearby. Even in a small garden, a lot of food can be grown.

Instruction

1. Discuss the idea of the Garden Farming Action Group, consider the extra work it will need, and agree to join the group and stick together, in order to make it succeed with growing food.
2. Choose two group coordinators.
3. Agree on what day in the week to meet for the weekly lessons and actions.
4. Discuss the situation of each of the orphan children belonging to your group members, and decide what improvement you can make happen during the first month.

If the Trios around each child have not yet been formed, this should be the first step.

In the first meeting of every month, your group follows up on the orphan children. Each member explains how it went with the planned improvement, and decides what will happen in the next month. You also note if the child is well, and if not, discuss what to do.

Homework

Tell the rest of the family about the plans of the Garden Farming Action Group, and mobilize them to support the work. Tell the orphan child about the improvement you think should happen, and make sure the child wants to cooperate.



Month 1

Getting started with garden farming

Week 2 - We plan to grow healthy food for the orphaned children

Lesson: Healthy food for healthy children

To be healthy means, that all the parts of your body are working well. You feel fresh and alert, and ready to struggle with the issues of the day.

On the contrary, if you are not healthy, you feel weak and give up easily when there are problems. Children, who are not healthy, do not learn well.

What you eat can have big consequences for your health and well-being. Food is not taken just to fill up the stomach, but to give the required nutrients to your body.

Healthy food is the food that provides good energy for the body. You can fill your stomach with rice or maize, but it is not enough to keep your body in good shape. You can use it as energy for moving around, but there will not be enough energy left to make your body grow stronger, and make your brain work as well as it actually can. For that to happen, you also need proteins, vitamins, and minerals.

When you eat food from all the food groups, you also build a strong defense against bacteria and illness.

THE FOOD GROUPS



Staple food



*Helper food
for growth*



*Helper food
for protection*



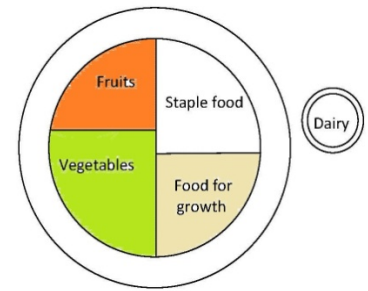
*Helper food
For more energy*

To be healthy you need to eat something from all the food groups every day. The circles show the food groups.

This drawing of a plate shows how much to eat from each food group, at every meal.

Staple food

Your basic foods are called staple food. Staple food provides your body with energy. It is usually grains like rice, maize, millet or wheat; roots like potatoes, sweet potatoes, cassava and yams; and fruits like green banana. It is important to add food from the other food groups to enable the body to stay strong and grow.



A plate of healthy food

Helper foods for growth of the body, and for maintaining all the body functions are fish, meat and eggs plus vegetables like beans, soy, peas and peanuts.

Helper foods for protection against diseases are vitamins and minerals. They are found in all sorts of vegetables and fruits.

Helper foods for more energy are fats found in butter, margarine, peanut butter, vegetable oil and milk from coconuts, peanuts, cashews and dried seeds.

The most common hidden diseases in children are shown here. A lack of iron, vitamin A and iodine does not make a child look as ill as when he has diarrhea, but he will be weak and tired, and not develop as he should. Eating fresh vegetables and fruits will help for all these diseases.

Anemia by iron deficiency - 7 in 10 children



Vitamin A deficiency - 7 in 10 children



Iodine deficiency - 5 in 10 children



Instruction

1. Look at the pictures of the food groups and repeat what foods belong to each group.
2. Tell each other what you normally eat in a day.
3. Look at the food groups and discuss what you could add to the meals without costing too much. Some greens like African spinach and black jack are even growing wild.
4. Agree who will meet with the Headman on the land to use for the common garden.

Home work

Tell your family about the food groups. Agree on where to make the backyard gardens or the garden farms.








Month 1

Getting started with garden farming

Week 3 - We start by preparing our garden farm nursery

Lesson: We start with beans, sweet potatoes, rape, onions and tomatoes

When you start a garden, it is a good idea to start with some common vegetables that are known to your area.

	Beans are among the helper foods for growth. They contain proteins, and if you do not have much meat, beans are almost as good. They can be dried and kept for a long time. Beans are also very good for building healthy soil.
	Sweet potatoes are among the helper foods for protection as well as a staple food. They are also called a 'Super Food' because they contain a lot of vitamin A and 12 other vitamins. Sweet potatoes can be stored in the ground for many months.
	Rape is also a helper food for protection. Rape is very rich in vitamins and iron. It is easy to grow, and when the leaves are cut, others grow out. There should always be rape or other green, leafy vegetables in your garden and on your table.
	Onion is another helper food for protection. It is a good source of what is called fibers, which helps with digestion. It has many vitamins and minerals. Onions can be stored for a long time and are easy to transport to the market.
	Tomatoes, again a helper food for protection, have a lot of vitamin A and C, potassium and foliate, all much needed to stay healthy. It helps the body's energy production and is good for keeping your bones healthy. Tomatoes are a good produce for selling.

There are many different kinds of vitamins and minerals. Different vegetables contain different types. A rule of thumb says that if you eat fruit and vegetables of all the colors of the rainbow, then you will get enough of all the different types.

Look for the colors **red**, **blue/purple**, **green**, **white** and **orange/yellow**.

If your common garden is 10 m x 15 m, you should be able to make about 15 beds with a width of 80 cm, and a length of 10 meters each.

Plant sweet potatoes and beans in half of the garden. The orange version of sweet potatoes has the most vitamins. They are very good for covering the soil and keeping it moist. Beans bind nitrogen in the soil. Together they will improve the soil. Next time, you can change and plant sweet potatoes and beans in the other half of the garden. You can also change sweet potatoes with cassava and rape with amaranth, or add some new rows with these plants.

Do not plant many rows besides each other with the same vegetables



Mix the plants between each other



Roots have different lengths

Mixing the rows between each other makes it more difficult for insects to spread. Different plants support each other. Some have long roots, while others have short roots. Some use a lot of space while others can do with less.

You could plant one row with onions and rape, one with only tomatoes, and then again onions and rape, and so on. Next time you plant, use a different order so that different plants with different needs are using the soil. Never plant beans and onions besides each other.

Onions, rape and tomatoes have to be sown in a nursery and transplanted. We will start with them. The space between the plants in the garden should be:

Onions: 5-10 cm	Rape: 20-25 cm	Tomatoes: 30-40 cm
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Beans can be sown directly, and sweet potatoes can be planted directly.

Instruction

1. Visit the land and imagine how the common garden could look.
2. Calculate how many seeds you need for onions, rape and tomatoes, including how many you need for the backyard gardens and gardens farms. Add one fifth or more of seeds, as not all will germinate.
3. Discuss how to get hold of the seeds.

Homework

Collect seeds from people who have gardens or from local shops. Ask them how they used to sow and plant.

Month 1

Getting started with garden farming

Week 4 - We make the nursery

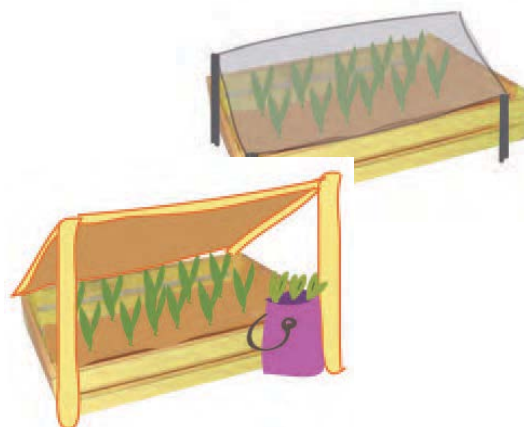
Lesson: How to mix soil and sow

Small seeds are easier to manage if they are sown in trays in a nursery. When they grow in a tray, you know how many plants you get out of your seeds, and you can distribute them evenly when you transplant to the garden.

Seeds in trays need protection from strong sunshine and rain, and they need air. The trays should be placed in such a way that they will not be drowned in heavy rain. There are many different ways to make the nursery:



*A big nursery for the common garden
-the roof can also be made with straw*



Small nurseries for back yard gardens

Mixing soil:

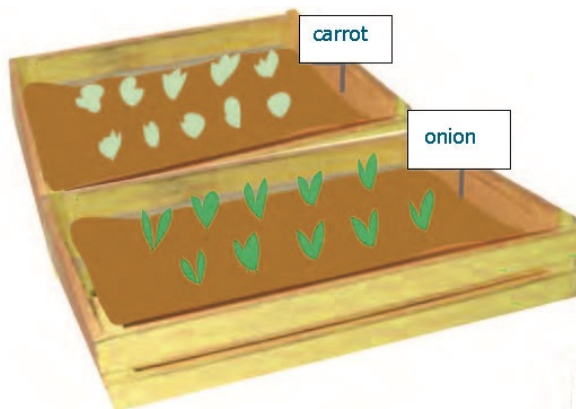


The soil for the seedbeds are mixed of equal parts of:

- Soil
- Sand
- Organic compost

Find a clean place in the garden and mix it well. Smoothen out any lumps and remove stones.

Any type of box or container can be used as a tray in the nursery. Fill a layer of sand in the bottom, and fill up the rest with the mixed soil.



Trays for nursery



Whatever type of tray you use, you have to make small holes in the bottom for excess water to run out. Moisten the soil, mark rows in the tray, place the seeds in the rows – 1 cm apart, cover with soil, clasp it, and finally cover the tray with newspaper or dry grass, or both, and moisten again.

Give water with a fine sprinkler. The mixture should always be kept damp.

Give water every day.



After a few days the seeds will sprout



Plastic bottle with holes used for watering

Instruction

Organize your group around the tasks of making the nursery:

1. Make the shade for the common nursery out of local material.
2. Make the trays for planting out of local material.
3. Mix the soil and prepare the trays.
4. Sow the seeds and cover them.
5. Give water and agree on who will look after the nursery every day.

Homework

Make your nursery for the backyard gardens or garden farm in the same manner, together with your family and children.

Month 2

Preparing the soil for our common garden and the backyard gardens

Week 1 - We learn about healthy soil

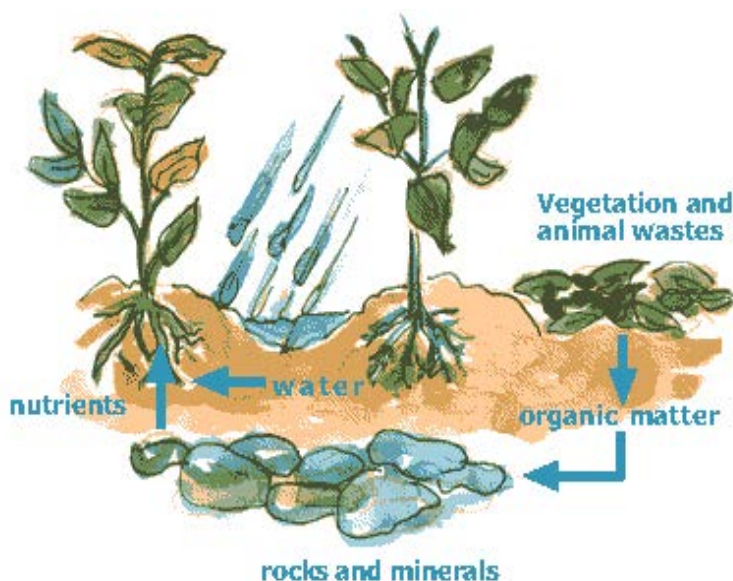
Lesson: How to make compost

Although we do not see them because they are very small, there are millions of animals and plants living in the soil. These are microorganisms. They live off the plant residues that fall from trees, bushes, flowers and crops, and from dead animals. They tear it apart until it becomes very small. Soil consists of all these small parts. And new plants draw nourishment from them. Take a look at the bottom of a forest or thick bush. Here are lots of branches, leaves and grasses in the process of being broken down in this manner.

If the microorganisms die, the soil also "dies" and will not be able to feed the plants.

When we burn a field to clear it for planting, we kill all the microorganisms in the topsoil. When we do not take good care of the soil, we can destroy in a very short time, what took nature millions of years to create. It is important to learn to take care of soil, and to give back to it the nutrients that we removed with the harvest.

The microorganisms also need water to live, and the plants need water, because the nutrients have to be mixed with water for the plants to be able to drink them.



The microorganisms in the soil are almost always very busy breaking down plants and mineral waste. They prepare the soil nutrients for the plants to use. This is called humus.

How can we prepare healthy soil for our garden plants?

One of the most important jobs in the garden is to feed the microorganisms by adding organic matter (rest of living things) to the soil.

There are many different ways to add organic matter to the soil:



Sandy soil:
The water drains faster
and dries easily.

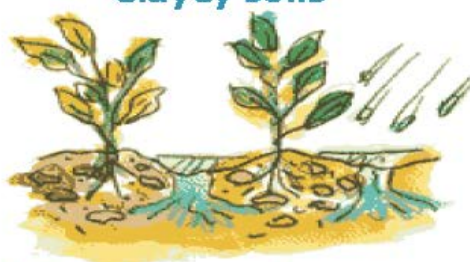
Cover the soil with dead plants and let the microorganisms do the job of changing them to humus. This is called mulching.

Mix dung from animals with plant material, and leave it in a pile to start the breaking down process. After 2-3 months, you get compost that can be added to the soil.



Clayey soils

Plant “cover crops” between the vegetables to make sure that the soil is not left bare to dry in the sun. The more plants there are on the soil, the more plant material will be left for the microorganisms to eat.



Soils with organic matter

Add microorganisms by adding ‘good soil’ from a wood or a fertile field.

When we add organic material to the soil, water from rain or watering will stay around the plants, as if they were planted in a sponge.

Instruction

1. Practice what you have learned by asking questions of each other.
2. Give examples from your own experiences with soil.
3. Follow up on the orphans.

When you started the action group, you made a list of all the orphaned children you care for in your group, and decided the monthly steps to take to make their lives better. Has it happened? Take point by point and say OK or NOT OK. If there are many children, you can divide into 2 groups. If the answer is NOT OK, discuss and find solutions involving the Trios.

Homework

For next week’s lesson, bring animal manure from cows, pigs or goats, and organic kitchen waste, 2 buckets each. Also, bring dried straw or plants, a bucket of ash and tools for working. (See the pictures in Week 2).

Month 2

Preparing the soil for our common garden and the backyard gardens

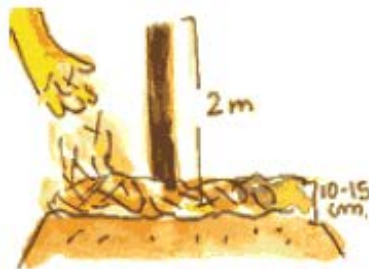
Week 2 - We make compost

Lesson: How to make compost

Go through the pictures hereunder, one by one, by reading the text and remembering the details.



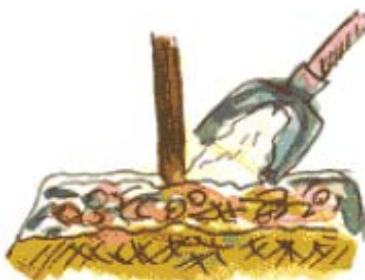
Choose a dry place in the garden with a little shade; loosen the soil 30 to 60 cm deep, without turning it.



Bury a 2m high stick in the center. First place a layer of dry straw or stems on the loose soil.



Without flattening the under layer, add a layer of kitchen and vegetable scraps.



Sprinkle a small amount of ash or lime to avoid bad odors when the decomposition starts.



The following layer is made with manure.



Then another layer with soil. It has to be watered daily.



Stop the pile, when it is 1.5 m high

Continue to add new layers following the same pattern. When the pile has many layers and has reached a height of 1.5 m:

- ✓ Cover the pile with 3 cm of soil, or with a layer of straw to cover everything.
- ✓ Water the pile, and remove the stick, leaving the hole for ventilation.
- ✓ If you have more material, do not continue adding. Make a new pile.

After 3 days: Stick a hand into the pile to feel if it still has moisture, not too wet and not too dry.

- ✓ If dry, give more water.
- ✓ In summer you might need to water it every day.
- ✓ In heavy rain, cover the pile with plastic.

Stick a hand into the pile to feel its moisture content



After 3 weeks, turn the pile with a rake or shovel to air it.

Hereafter turn it every 10 days.

After 3 months, the compost will be ready: All the material is changed; it smells of soil, it has a dark color.

Instruction

Check that you have all the materials:

1. Animal manure from cows, pigs or goats.
2. Organic kitchen waste.
3. Dried straw or plants.
4. A bucket of ash.
5. Make the compost pile as described.
6. Agree on who will check it and give water.
7. Thin the plants in the nursery, if they grow on top of each other.

Homework

Make a compost heap at home in the same manner.

Involve your children and teach them how to do it.

Bring rakes, shovels and hoes to next weeks' Lesson & Action.



Month 2

Preparing the soil for our common garden and the backyard gardens

Week 3 - We fence the garden

Lesson: How to make a fence

It is necessary to fence the garden to protect it from animals, especially goats. There are many ways to make a fence. The cheapest way to start is by collecting sticky branches or stones, and piling them up around the borders of the garden.

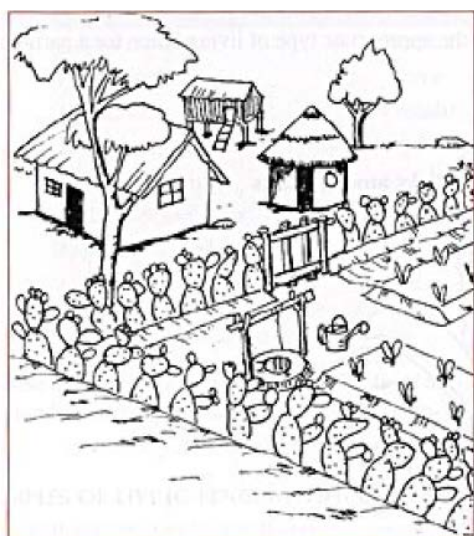


Garden with stone fence

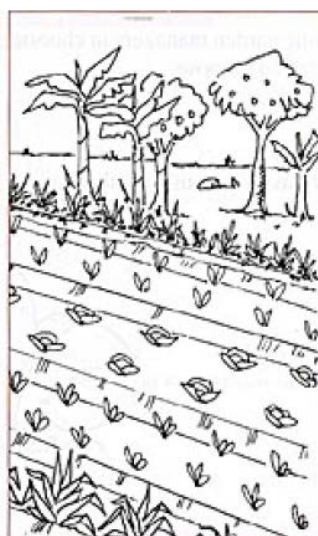


Fences made of branches and stones

If you want to make the fence stronger with time, you can grow a hedge along the inside of the fence. A hedge is also important in windy places, because it protects the vegetables from the wind. Plants like aloes, buckthorn, hawthorn, prickly pears, sisal, honey locust, mulberry and bamboo can be used. If you decide to grow a living fence, choose a local plant, and learn how to do it from people who have already used it.



Garden with fence of prickly pears



Garden with aloes



Prickly pear

Instruction

1. Agree on the best material to use for fencing the common garden. It should be available free of cost. It would be an advantage, if you can move it later when you want the garden to be bigger.
2. Mark the line where you want the fence to be.
3. Make the fence. It might take some time. If you cannot finish it, you could invite your family for an action.
4. Remember to check the moisture in the compost heap together, and agree if it is ok, or it needs more or less water.

Homework

Fence your gardens at home.

Make it a must to involve your children in all the work.

Explain to them why the fence is important, and how to make it. When you involve your children, you are giving them training for a lifetime, so that they will always be able to produce their own food.

Check your compost heap at home.

Bring rakes, shovels, machetes and hoes to next weeks' Lesson & Action, and a wheelbarrow, if you have one.



Month 2

Preparing the soil for our common garden and the backyard gardens

Week 4 - We clear the land

Lesson: Why burning is a bad way to clear land

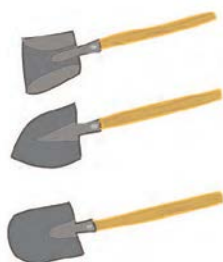
It is necessary to clear the area for the garden well. The fastest way may be to burn it all. But we have already learnt that by burning the vegetation on the land, we also burn the microorganisms. As we need the microorganisms to produce new soil, we should not kill them. Besides, there is always a chance of fires running wild.

Looking at the picture it is easy to imagine how the fire can spread with all the dry grass. Many trees will burn, if a wild fire is not stopped, and both the trees and the grass will be wasted. The main reason for many places in Africa and around the world to have become dry, is that all the trees have been felled, leaving the land open for the sun to heat it up, and for the rain to wash it away. Tree cover is very important for people, animals and crops. Trees give us shade, food and timber if they are taken good care of.

Therefore, we will have to clear the land the hard way, by removing all the plants and trees, using all the tools we have.



Useful garden tools:



Spade, flat – to mark and cut in soft soil

Spade – pointed, for hard soil

Shovel - wide for loading



Garden fork – to turn the soil

Hoe – to break up soil, to weed and to mark

Rake – to smoothen soil

Weeding hoe – to break soil and weed

Machete – to cut and slash

However, this also has an advantage, as we can use the material we take away:

- ✓ Trees and scrubs can be used as firewood.
- ✓ Small brushwood, branches, leaves and grass can be piled and dried, and used for the next compost.
- ✓ Stones must be collected; maybe they can be placed as a part of the fence.
- ✓ Jars, glass, bottles, bones and other rubbish must be dug into a hole somewhere, or maybe some of it can be sold.



Instruction

1. Clear the land in a systematic manner. You could form a row at one end of the field and walk forward together, step by step, till the other end is reached.
2. Decide along the way, how to use or get rid of the material you find.
3. Remember to check the compost heap together and agree that it is ok.

Homework

Clear the land in your own backyard gardens and garden farms.

Engage your family and children to help. Explain to them why burning the land is a bad idea.

Think about how the space in your backyard garden or garden farm can be used in the best manner, as the next meeting is about planning the common garden and the backyard gardens, and garden farms.



Keep all your tools clean and well sharpened.
Wash them after every use.
If you are not using them for some time, rub them with an oiled rag.



Month 3

Planning for growing healthy vegetables

Week 1 – Making the best use of the land we have

Lesson: Making the plan of the garden

When you plan for how the garden should finally look, it is important to start by looking at the terrain, and imagine how the water will flow. In this picture, the garden is sloping slightly towards the lower right corner. When you know how the water will run, you can plan how to get the most out of the rain and how to make the irrigation easiest.



Plan for how to get the most out of the water

The picture shows how a ditch has been dug to lead the water from the highest point, across the garden, to the lowest point, where the excess water can escape.

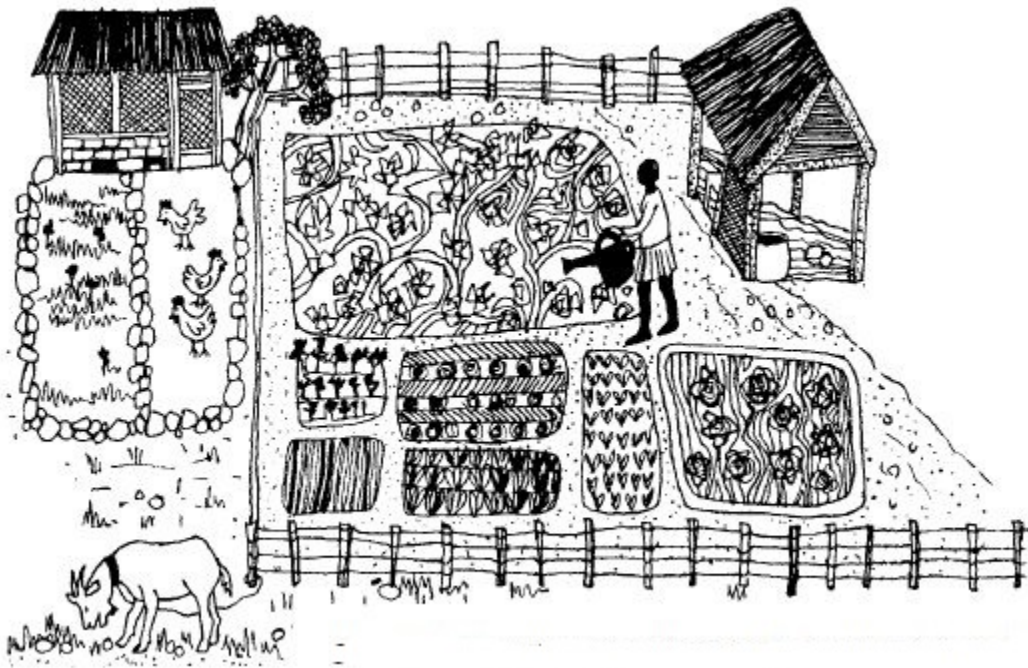
The beds should always be placed in such a way that water does not run away along them, but is stopped – you could say that the direction of the bed should be across the main direction of the stream.

If there is a steep slope, you can make terraces. At the edge of each terrace, you need to place stones or plant vetiver grass so that a small wall is formed to stop the water, and the soil from running away.

Garden with terraces



When this is decided, you can plan for the rest of the garden. Where to plant each of the vegetables, how long the beds shall be and so on.



A well planned garden with intercropping between different vegetables

In the backyard gardens, wastewater from the kitchen can be used for watering vegetables. This is a good argument for making the garden behind the kitchen.

Instruction

1. Read the text and look at the pictures. Discuss the explanations on how to manage the water in the garden, and share your own experiences on managing water.
2. Go together to the place for the common garden and look at the terrain. Discuss how you think the garden should be organized and make a drawing.
3. Follow up on the orphan children. Each one of you tells about the health of the child, and how it went with the planned improvements.
4. In groups of 4-5, discuss what a good plan of action will be for each of the children for the coming month, and share the idea and plans with the whole group.

Homework

Make the plans for your backyard gardens and garden farms, and make a drawing of the plan. Carry out the plan for the orphan child. If you need help, discuss it with some of the people with whom you made the plan.

For next week, get hold of manure to cover the beds and bring the tools to do it.

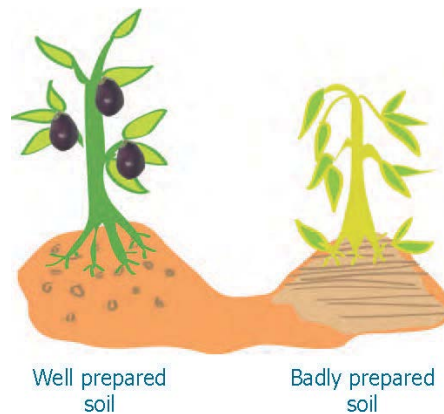
Month 3

Planning for growing healthy vegetables

Week 2 – We prepare the soil for planting

Lesson: Starting up the garden with good soil preparation

You have by now fenced the common garden, and cleared the land for unwanted plants and rubbish. The next step is to prepare the soil. Soil preparation consists of tilling the ground and loosening it to make it spongy. Then the roots will develop well and the plants will be better off.

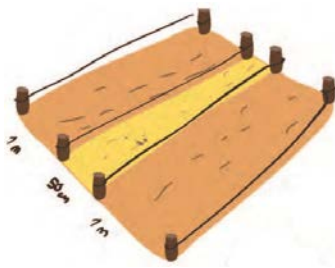


Before you start on preparing the soil, make sure there is enough moisture in the soil.



When a garden is small, it is a good idea to make raised beds. This will allow more plants to grow. Follow the description hereunder to make raised beds and improve the soil in the beds.

1+2



1. Mark where you want the beds to be. Mark 80 cm for the bed, 20 cm for space to walk between the beds, and again 80 cm for the next bed. If water is scarce, make the beds less than 80 cm.

2. Dig a furrow along the side of the bed, 15 cm deep. Place the soil on top of the bed.

3. Put compost or manure on the top of the bed, and mix it into the top 10 cm of soil.

4. Deepen the furrow another 10 cm and place the soil on the top of the row.

5. Flatten the edges and the top of the bed with a shovel. Break up lumps and smooth the top of the bed with a rake.

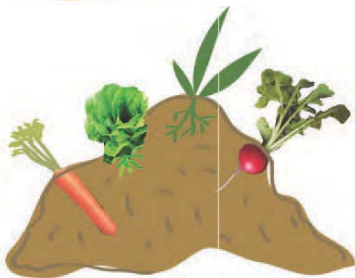
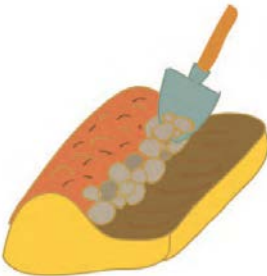
6. If you live in an area with much rain, place stones along the beds to protect them.

7. Cover with mulch. This will protect the surface and keep it humid. Leave a small piece uncovered, and note the difference next week.

3+4



5+6



Bed with plants



Garden ready for sowing

Instruction

1. Look at the pictures and repeat the explanations.
2. Measure out the beds where you want them to be.
3. Distribute the beds between you, and dig the furrows.
4. Mix the soil on the top of the bed with manure by digging.
5. Cover the beds with mulch (straw, dry leaves, plant waste – whatever you can get hold of). The aim is to keep the soil protected from the sun.

Homework

Prepare the soil in the backyard gardens in the same manner, together with your family and children. Bring a ruler and tools for the next Lesson & Action. Do not water the seedlings the last 2 days before transplanting them. Place them outside the nursery to “harden” them.

Month 3

Planning for growing healthy vegetables

Week 3 – We transplant the seedlings

Lesson: Preparing the beds for transplanting

The seedlings are ready for transplanting when they have 4-5 leaves, and are firm.

To get the most out of the land and let the plants support each other against insects and pest, you should use intercropping between different plants.

With the raised beds, you can plant 1, 2 or 3 rows in each bed, depending on the plants.

Bed 1: Onion and rape.

Plant 1 onion – leave 60 cm space – plant 1 rape.

Make 15 cm spaces between each onion plant, and 30 cm between each rape plant.

Bed 2: Tomatoes only.

Plant in the middle of the bed.

Make 30 to 50 cm spaces between each plant.

Bed 3: Onion and rape again – and so on.

Prepare to plant half of the beds in the garden.

Transplant early in the morning or on a cloudy day.

Water the seedlings before you transplant them, so the soil sticks to the roots.

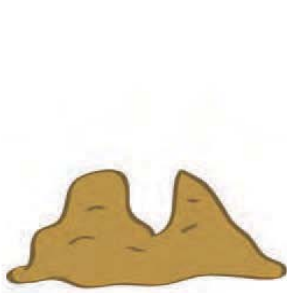


Inter-cropping



- 1- Remove the seedlings with a small trowel, taking up as much soil as possible.
- 2- Separate them carefully, one by one, onto a wet cloth or paper.
Now is a good time to remove any plants that are small or weak.
- 3- Do not take out more seedlings than you plan to plant on that day.
Keep the seedlings in the shade and under a wet cloth while you transplant.

Make the planting holes before you move the seedlings. Roots should be uncovered as short time as possible. Move the seedlings on a tray.



Make a line of holes in the raised beds. The distances between the holes depend on the vegetable to be planted.



Place the seedling with the whole plug into the hole.



Press the soil with your hands so that the roots make contact with the earth below.

If the roots are bare, be careful not to bend them, and press the soil firmly around the plants.

Plant onions and rape at the same depth they grew in the planting tray.

Plant tomatoes a little deeper than they grew in the planting tray.

After planting, give water.



You can water by furrows.



You can also use a watering can, but avoid wetting the leaves.

Instruction

1. Read the text and look at the pictures. In gardening, every detail is important.
2. Form two groups, one that make the holes and one that plants the seedlings.
3. Use a ruler to make small sticks in the correct lengths to measure the distance between plants and rows.
4. Do not dig up more plants than you can plant on the same day.
5. Give water and make shades for the planted seedlings with branches with leaves on.
6. Mulch the beds where you have planted.

Homework

Agree on who will give water to the plants in the common garden. Plant your seedlings in the home gardens in the same way. Bring the ruler, seeds for beans and vines of sweet potatoes for the next Lesson & Action.

Month 3

Planning for growing healthy vegetables

Week 4 – We plant and sow

Lesson: Planting sweet potatoes and sowing beans

You have already prepared the soil well:

There is good ventilation

Microorganisms develop well

Rain and irrigation water can enter easily

Now it is time for sowing beans and planting sweet potatoes in the remaining beds. Both these plants need to have space, so you can only plant one bean or one sweet potato in a bed.

	Beans	Sweet Potatoes
Row 1: Beans		
Row 2: Sweet potatoes		
Row 3: Beans		
Row 4: Sweet potatoes	40 cm	40 cm

There are more ways to sow directly in the garden.

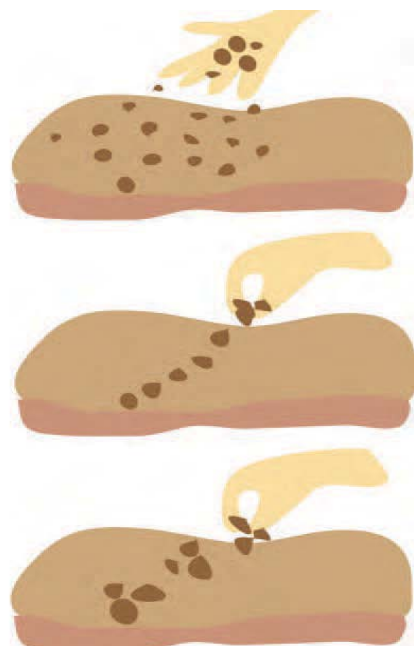
If you buy the seeds, there is an instruction on the back of the packet.

For beans, you should use drilling – meaning placing 2-3 seeds in each hole and placing them 4 cm in depth.



Direct sowing can be done in several ways:

- **Broadcast:** the seeds are scattered over the surface of the bed.
- **In line:** the seeds are placed in rows at regular distances apart.
- **Drilling:** 2 to 3 seeds are placed in small separate holes.



Sweet potatoes are planted from vines cut from already growing sweet potatoes.

Planting of new sweet potatoes should be done as soon as possible after the last harvest. Vines can be stored 1-3 days without losing any yield. When the vines are cut, the cuttings can be kept for a maximum of 7 days before planting. To preserve the food reserves in the stem, most of the leaves on each cutting should be removed, leaving only a few leaves on the top. The plants should be tied together in small bundles with the bases covered with a wet cloth or sack, until they are planted.



Select only healthy vines and plant on the raised beds

Instruction

1. Read about sowing beans and planting sweet potatoes.
2. Use the ruler to make measure sticks for the distance between the plants.
3. Make 2 groups.
4. The first group starts to plant the sweet potatoes in a raised bed, as shown above.
5. The other group starts to sow the beans in a row along the next raised bed.
6. Continue until all beds are finished.
7. Give water and cover the beds with mulch.
8. Check that the vegetables transplanted last week are growing well; remove the branches placed for shade.
9. Put dead, bushy branches besides the potato plants for them to climb on.
10. Make an additional compost heap to have more compost ready for use.

Homework

Plant sweet potatoes and sow beans in the backyard gardens and garden farms.

Make the second compost pile.

Month 4

All families have a backyard garden or a garden farm

Week 1 – All families have a backyard garden or a garden farm

Lesson: The importance of being able to grow your own food

When you have a vegetable garden, you are more in control of getting food, and getting healthy food. Draughts, pest and crop diseases have always threatened food security. Now we live in the age of global warming and a changing climate. We already feel the consequences of this, with rain coming late, or at times when it is not expected. Crops die from lack of water, or drown in rains. Transport gets expensive. The shops have no food. Or, you have no money.

Therefore, the more food you can produce at home, the better for the family's health and economy. Everyone in the family can participate in growing food in the garden. Maybe you can even sell some produce.

It takes some time to become a skilled gardener. This is another reason for getting started as soon as possible.

There can also be many problems to overcome. That is why the Garden Farming Action Group is formed, and we are there to help each other.

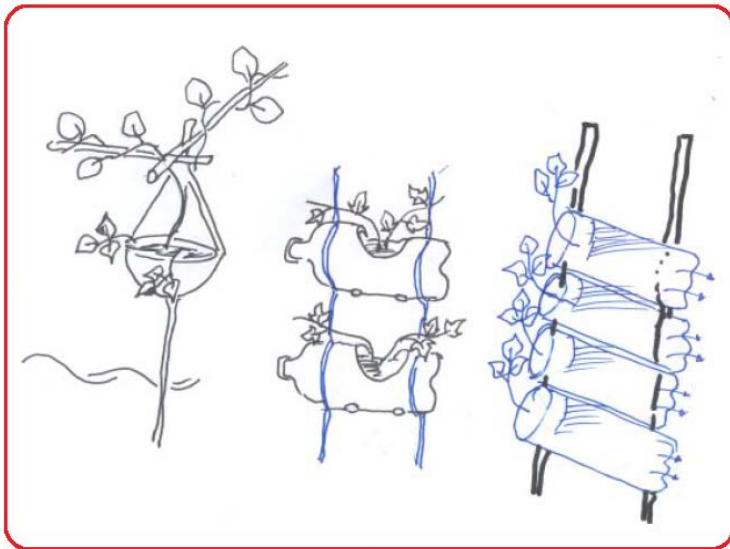
One reason for not getting started might be the lack of space for a garden. But there can be many solutions to that. Look at the pictures hereunder and see how this has been solved in other places.



Growing pumpkins on the roof



If you have no soil, plant in boxes



Hanging plants in small spaces

Soil mixture for growing in boxes, bottles or containers:

1 part soil

1.5 parts well prepared compost

0.5 parts sand or rice hull

Make holes in the bottom to allow excess water to run out.

Make clear bottles dark around the soil.

You can plant in bottles, pots, bamboo pieces, shells of green coconuts etc.

You can hang the containers on a wall, from the roof or from a tree.

Instruction

1. Taking turns in the group, tell each other how it is going with establishing the backyard gardens, and the garden farms.
2. List all the good arguments you have for why each family should have a backyard garden, or a garden farm.
3. If a family has not established a garden yet, hear the reasons, discuss possible solutions and find ways to help each other.
4. Decide how to follow up on the headline for this month - "All families have a backyard garden or a garden farm" - every week, and agree to visit all the gardens together in the last week of the month.
5. Follow up on the improvements you have decided should happen for the orphan children, and make the proposals for actions to happen this month.

Homework

Prepare for making the nursery again. Collect seeds for tomatoes, a new green leafy local plant, maybe spinach or amaranth, and a new vegetable, maybe eggplant (brinjal). Get hold of the details of how they should be sown in the nursery, and prepare the sowing trays.

Carry out the actions you have agreed on for every family to get a backyard garden, or a garden farm.

Carry out the improvements you have agreed on for the orphan children.

Month 4

All families have a backyard garden or a garden farm

Week 2 – We water the garden

Lesson: Good water systems and how to give water

How much water do the plants need? Ask them!

You can do the following test:

Two days after watering, make a hole near the plant.

The moisture should be below the plant's roots.

Water should not be accumulated at that depth.



Different plants need different amounts of water. As a rule, water in the early morning and in the evening just after planting and sowing. After a week, give water twice a week. If the plant's leaves look droopy and lifeless you should water them immediately. Too much water drowns the plants.



Sprinkler watering

You can use a watering can, a hose, or a perforated can or bottle.

The leaves should not be full of water, so give water in the morning, so that they can dry in the sun. Do not gush water on small seedlings. Water with a fine mist.

Sprinkler

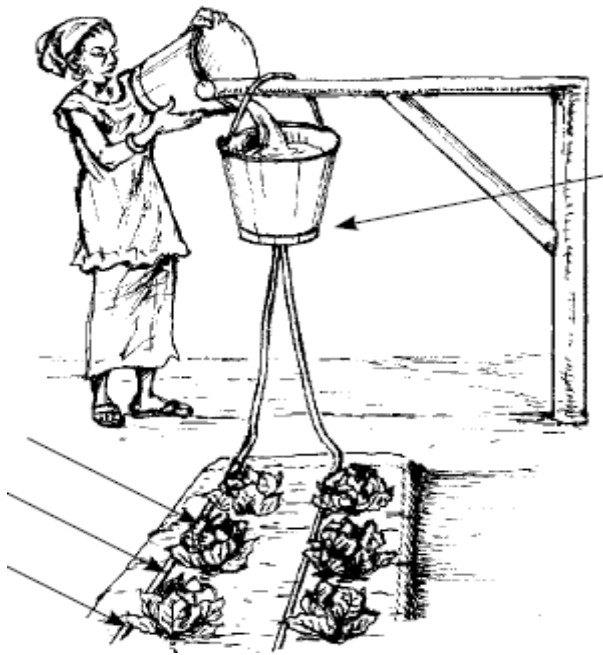


Irrigation channels

Only useful, if the slope is not steep. The water should run slowly, not stagnate, not break the furrows and not carry the soil away.

Watch carefully; maybe guide the water with a shovel. Water in the mornings.

Channels



Drip irrigation

Drip irrigation

With drip irrigation, you lead the water directly to each plant. The pipe has small holes besides each plant. This saves water and avoids sprinkling water on the plants.

Use of wastewater

You can use wastewater from dishwashing and rinsing for watering the garden.

You cannot use water with soap from washing clothes or from the toilet.

Make sure the water goes into the soil and not over the leaves.

Instruction

1. Read about watering and look at the different systems of giving water, and how to use wastewater.
2. Discuss what watering system will fit best for the common garden.
3. Make the changes to the watering system, if any are needed.
4. Prepare the nursery to sow for the second time. Read the instruction under month 1, week 4, and use your own experiences from the first time you made the nurseries. Make sure the shade is still working.
5. This time you should plan with extra plants, so that you can use some plants for producing the seeds you will need next time you have to sow in the nursery.
6. Sow the seeds. Agree on watering.
7. Follow up on the plans for all families to have backyard gardens.

Homework

Make the watering system you have decided to use in your backyard garden. Prepare the nursery for the second time. Bring garden tools for the next Lesson & Action.

Month 4

All families have a backyard garden or a garden farm

Week 3 – Weeding and scouting for insects

Lesson: Insect pests, diseases and weeds

Insect pests, plant diseases and weeds can be serious threats to crops. It has been common for many years to spread pesticides onto plants to kill the pests. But these actually contain chemicals, which are harmful to humans. Often they kill the pests, but also leave harmful substances on the plants, and in our water.

The best way to manage pests and plant diseases is to grow healthy plants. This means to use healthy seeds, build good soil, plant at the right time, keep correct spaces between the plants, plant many different types of plants together, rotate between different vegetables in each bed from year to year, and give water from below. This is called natural pest management.

Insects

Not all insects eat the plants. Some live from eating other insects, so they might help you to keep insects down. Harmful insects always eat the plants, but they can be difficult to spot. Insect pests are the insects that feed on human food, or transmit diseases to humans and life stock. Only 1 in hundred insect types are insect pests.



Insect pests eat the plants



Watch what insects do to see if they are damaging or helping your crops.

Check the garden for insects by walking across it from one corner to the other, and see what you find. Do the insects eat your crops, or do they eat other insects? If the insects eat the crops, you can collect them in a bag and burn it. Plants can develop in spite of pests if there are not too many. If you cannot control the pests, ask local farmers what they do, but avoid chemicals. Some common insect pests are slugs, white flies, aphids, larvae and thrips.

Diseases

Many diseases can affect plants and damage vegetables.

When a plant is sick, it looks yellow, faded or wilted. It is weak. Its fruit is rotten.

Remove sick plants from the beds and be careful no parts of them are left. The best way to avoid plant diseases is to grow healthy plants.

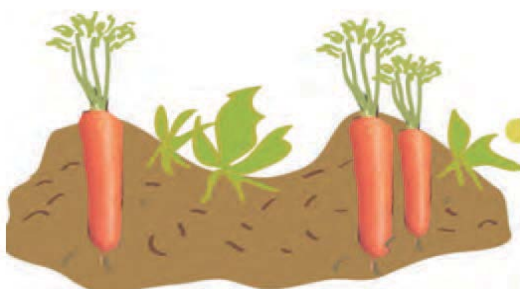


Healthy plants

Sick plants

Weeds

Weeds are plants that you have not planted, and do not want in your garden. Weeds take away nutrients, water and light from your plants.



Weeds between carrots

Weeds cause the most damage when the plants are very young. You need to prevent weeds from the very beginning by covering the soil with mulch, and being careful not to infect the garden with seeds of weeds near the garden, or in the water when watering.

Instruction

1. Read the text and look at the pictures. Repeat for each other how to control insect pests, plant diseases and weeds.
2. Take a tour in the garden to look for pests. What do you find? Can the plants manage by themselves, or do you need to do something?
3. Walk along the beds and look for weeds. Remove unwanted plants by pulling them up, or use the hoe to remove them. Do not disturb the soil too deep down. Throw the weeds somewhere far from the garden to dry, or burn them.
4. Check the plants for water, check the nursery and thin out in the plants.
5. Make the plan for how to visit all the backyard gardens at the next Lesson & Action. If some are still not made you could consider making them together.

Homework

Check the backyard gardens and garden farms for insect pests, plant diseases, and weeds. Thin the seedlings in the nursery and the plants in the beds.

Prepare what you want to tell and show in next weeks' visit to your garden.

Month 4

All families have a backyard garden or a garden farm

Week 4 – We visit the family backyard gardens and garden farms

Lesson: We share our experiences from making backyard gardens

The aim of today's visits is to celebrate that all the gardens have been started, learn from each other and give good advices.

The host will tell and show about her garden.
The visitors will listen and ask questions.



Instruction

1. You could meet before the visits to the gardens start, and form groups of five members who will visit each other's Garden Farms, and meet again after the visits, to hear about the results.
2. You could make sure that all the family members participate when you come to visit their garden.
3. You could agree to place the gardens in some categories, from just started, to having a nursery and a garden, and count how many gardens you have in each category.



Month 5

Our first harvest

Week 1 – We learn about harvesting and storing

Lesson: When and how to harvest, and how to keep the produce

The vegetables you have planted will be ready for harvesting at different times. The exact time will depend on the climate and the local weather. Some types of vegetables will ripen at the same time, while others can be harvested over several months.



Beans: Growing time 55- 80 days.

Pick beans when they are crisp and still slender, before the seeds begin to swell in the pods. As the seeds grow larger, the pods become tough and stringy. For this reason, beans must be picked at least every other day. Picking also make the plants produce more beans.



Sweet potatoes: Growing time 130-150 days.

Sometimes the leaves become yellow when the plant is ready for harvest. At other times, there are no visible signs. If harvested early, yields are low. Sweet potatoes are often harvested in small amounts over several months. First, cut off the vines, and then dig up the sweet potatoes with a hoe. It is important not to harm the potatoes by cuts and bruises, as an unharmed surface will give them a longer storage life.



Rape: Growing time 60-100 days.

Harvest the lower leaves of rape when the plants are sturdy and well established. Be sure to leave four to six leaves, so that the plant can continue to grow and produce more leaves throughout the growth period. A rape plant can grow for many years. If you want more plants, you can dig up the seedlings growing from the plant and place them where you want them.



Onions: Growing time 135-180 days.

Pick young onions for boiling and pickling. For onions to store, wait until half of the tops have started to die back and have fallen over. Knock the remaining tops over and let the onions stay in the ground for another week. Store the onions in a single layer, or in a mesh bag in a cool, dry, airy place out of direct sunshine. Cut off the tops and shorten the roots when the skin and tops have dried.



Tomatoes: Growing time 60-100 days.

Harvest when fruits are uniformly red, but before the end softens. Test: Ripe fruits will sink in water. Vine-ripened tomatoes are sweetest, but tomatoes will ripen off the vine if picked green. Green tomatoes should be wrapped in newspaper and kept at 16-20° C (55 F to 70° F). Tomatoes stored in this manner should last 3-5 weeks. Be sure to inspect each week for ripeness.

When you start harvesting the different vegetables, do not harvest the most healthy and good-looking beans and onions. Keep them for the seeds to develop, and harvest the seeds to use next time you sow in the nursery or in the garden. For onions, it will take two years to produce seeds. For sweet potatoes, keep healthy vines to plant. Tomato seeds are made from healthy, ripe potatoes.

Instruction

1. Read the text on when to harvest the vegetables.
2. Repeat the facts for each vegetable, and add your own experiences if you already have experiences of growing vegetables.
3. Follow up on the orphan children in your families. Did you succeed with the planned improvements? Make the plan for this month, and share with each other.

Homework

Continue to water and weed in the common garden, in the back yard gardens and the garden farms.

Carry out your planned improvements for the orphan children.

Bring baskets for carrying harvested vegetables next week.



Vegetables ready for harvest

Month 5

Our first harvest

Week 2 – We harvest the first vegetables

Lesson: Taking a closer look at the vegetables in the garden

It is impossible to say exactly how many days it will take for the vegetables to be ready for harvesting, as it depends very much on climate, temperature, soil, water, rain and how well they have been taken care of. Vegetables are at their best when they are harvested at the exact point of ripening, then they have the highest nutrient content and the best taste. To find out if the vegetables are ready, you need to study them. Take note of how long it has taken for each type of vegetable to be ready for harvest, so that you can make a good plan for when to sow in the nursery, and when to plant again.

You can harvest the vegetables that are ready.

Follow the descriptions from last week and look at the vegetables.



Use a sharp knife



Leave a bit of the stem

General rules for harvesting

- ✓ Harvest during the coolest hours, early morning or late afternoon.
- ✓ Place everything you have harvested in the shade as you go.
- ✓ Handle the produce carefully, avoid bruises or cuts.
- ✓ Use a very sharp knife to cut leafy vegetables, and to separate the edible part from the plant.
- ✓ Leave a bit of the stem attached to the fruit, so that diseases do not enter through the wound made when removing the stem.

Beans: Open a pod and take a bite of a bean. If it has grown to size and is crisp, it is ready for harvesting. Harvest what you need for the next couple of days. Pick often, as this will make the plants grow more beans. The beans you do not need now can be left to fully dry, and can easily be stored for a long time.

Rape: If the plant has grown solid, cut the leaves you need from the bottom. Rape will continue to produce new leaves for 4-5 years. The leaves can also be kept and stored by drying and grinding them into powder.

Tomatoes: Harvest tomatoes when the leaves have dried and the tomatoes are red and firm. You can also harvest green tomatoes and let them ripen at home, or use them for cooking or pickles.

Decide along the way which plants to keep for seeds.



Family enjoying harvesting together

Instruction

1. Read the text and prepare how to explain it to your families.
2. Walk together through the common garden and collect vegetables that are ready for harvest.
3. Distribute the harvested produce to the families who need it most.

Homework

Harvest and keep watering, and weeding in the backyard garden. Bring material to make compost heap no. 2 at the common garden.

Month 5

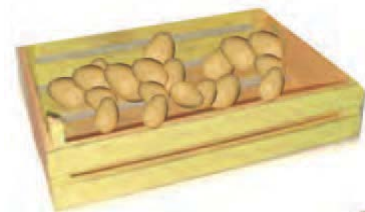
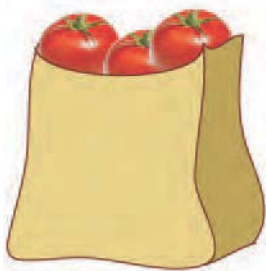
Our first harvest

Week 3 – We make good storing systems

Lesson: How to dry rape and tomatoes, and how to store beans

Most vegetables are easy to store. Some good guidelines are:

- ✓ Never store soft, damaged or infected vegetables. They will contaminate the healthy vegetables. Eat them, or throw them in the compost pile.
- ✓ When you cut the leaves from root vegetables, leave 1 cm of leaves at the root.
- ✓ Some leaves of root vegetables can be consumed.
- ✓ You can store vegetables in any room, which is not too cold and not too hot, and has shade. A basement is the best place.
- ✓ The room needs to have air that circulates, maybe from two windows or holes in opposite walls.
- ✓ You can store for a shorter time in baskets, cloth bags or paper bags.
- ✓ Never use plastic bags, as they will make the vegetables damp because the moist cannot escape.



Green leaves and tomatoes can be cut in small pieces or slices, and dried in the sun or over very low heat, and kept in closed glasses or containers.

Fruits, vegetables, and meats can be soaked in vinegar and kept in covered or sealed containers. The sourness of the vinegar keeps bacteria and fungus from growing.

Fruits can be preserved by being cooked in sugar syrup and placed in sealed jars. The jars have to be cleaned and boiled to get rid of bacteria.

Beans can be picked and kept for app. 4 days, or pickled the day you harvest them, to preserve the fresh, delicious, homegrown flavor.



To dry beans, leave the pods on the plants until they are brown and the seeds rattle inside them. Seeds should be so hard you can barely mark them with your teeth. If the pods have yellowed and a rainy spell is forecasted, you can cut the plants off near the ground and hang them upside down indoors to dry. Put the shelled beans in airtight, lidded containers. Add a small cloth bag with salt to absorb moisture, and store the beans in a cool, dry place. They can last for 10 to 12 months.

Bottles and jars used for storing have to be carefully cleaned and dried outside and inside, as well as inside the lid. The lid has to fit very tightly to avoid air coming in.

Instruction

1. Read how to store rape, tomatoes and beans.
2. Share local methods that could also be used.
3. Discuss where in your house to store vegetables, and how to find the containers or glass to use.



Homework

Make storing facilities at home. Ask friends and neighbors for good ideas for storing vegetables.



Month 5

Our first harvest

Week 4 – We prepare to use our own seeds and plants for the third round of vegetables

Lesson: How to keep quality seeds

Collecting seeds

To make sure you have good seeds, collect them from:

- ✓ Strong plants, free of pests and diseases.
- ✓ Plants from your local area.
- ✓ Plants with the qualities you want, such as size, taste, resistance to drought etc.

Do not collect seeds that have fallen to the ground by themselves. Sweep under plants to remove fallen seeds, and then shake the plant or tree to remove fresh seeds. Then clean the seeds as soon as possible after collecting them, and sort them to remove any seeds that are rotten or damaged.



Collect seeds from strong plants

Storing seeds

To judge how long each kind of seed can be stored, think about the conditions they grew in. For example, seeds from areas with a cold or dry season can usually be stored for months or years, because they need the right conditions to sprout. Seeds from areas that are hot and rainy most of the year, will not store well, because they can sprout at any time. Seeds with hard shells can usually be stored more easily, and for longer times than seeds with soft shells.



Wash the seeds carefully in clean water, sort out bad seeds, and dry the seeds on a piece of newspaper for 2-3 days in the shade. Finally sow them or keep them in paper bags for short storage, and in glasses, if it is for a longer period time.

Getting seeds from tomatoes

Chose ripe tomatoes, clean them, take out the seeds with a spoon along with the gel, and put it in a jar with a lid. Stir the mixture twice a day. The mixture will ferment and the good seeds will sink to the bottom in 5 days time.

Let the moisture out of the glass without the seeds. Dry the seeds indoors on a piece of a mosquito net, or a newspaper for 5-6 days. Squeeze the seeds to avoid them sticking together.



Fresh tomato seeds in pulp

Testing seeds

Hard-coated seeds can be tested in a glass of water. If the seeds float, they are not good. The good seeds drop to the bottom of the glass.



Good seeds drop to the bottom

Instruction

1. Read on how to collect and store seeds.
2. Go to the garden and collect seeds from beans.
3. Decide where to clean, dry, and store the seeds.
4. Follow the instructions.
5. Also, bring some ripe tomatoes, take out the seeds and place them in a jar together with the pulp.
6. Agree on how to take care of the seeds while they are drying, and how to store them.

Homework

Collect seeds from beans and tomatoes in the backyard gardens. Teach your family and children how to collect, clean, dry and store seeds. Continue to water and weed the garden.



Month 6

Second round of planning and planting

Week 1 – We learn about malnutrition and what to do about it

Lesson: Reasons for malnutrition, how to avoid it and how to cure it

What happens when a child is malnourished?

She is tired. She does not grow. She does not develop social skills. She does not learn. Malnutrition can mark children for life, as they will have difficulties in learning in school and in managing their adult lives.

How do we recognize malnutrition?

According to UNICEF's statistics, half the children, who die under 5 years of age, do so due to malnutrition. This totals 3 million children less than 5 years old, dying every year, due to malnutrition.

All newborn children need to be observed closely:

Does the child grow?

Measure its height and the thickness of the upper arm every week, and note the results by making marks on a stick and knots on a string.

Does the child develop like other children of the same age?

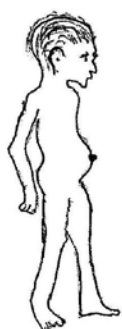
Note if the baby is lively and reacts when you play with her.

Does the child look sick? Does she cry a lot? Does she not feed well from the breast?

These can be signs of mild malnutrition.



Healthy baby



← *Mild malnutrition*
Serious malnutrition →



Reasons for malnutrition

Often, malnutrition in children is caused by the mother being malnourished while she is pregnant, and while she is breastfeeding.

Another reason can be that the child is not breastfed continuously, preferably until the age of 2 years. Malnutrition can also occur if the additional food a child is given from 6 months, and up to 2 years, is not enough and does

not supply the child with enough calories, vitamins and minerals for its body and brain to grow.

What to do about it

One way to prevent malnutrition is to ensure, that the mother eats enough nutritious food during pregnancy, and when she is breast-feeding.

There are many reasons for hunger and not eating well.

One reason is simply being Poor, so there is too little food, and too little of the nutritious foods the family needs to be healthy. Another reason is the lack of knowledge about nutrition and health, and how to get the best out of what you have. Always contact the local clinic if a child is not well.

For a child from 6 months to 2 years to be healthy we should:

- ✓ Keep feeding her breast milk as much as before.
- ✓ Feed her other nutritious foods as well, always starting with just a little.
- ✓ Feed her at least 5 times a day and give her snacks between meals.
- ✓ Make sure the food is clean, freshly prepared and well cooked.
- ✓ Filter, boil, or purify the water she drinks.
- ✓ Keep the child and her surroundings clean.
- ✓ When she gets sick, feed her very well and more often, and give her plenty of liquids to drink.

For a mother to stay healthy, she needs to eat from all the food groups every day: The staple food, food for growth, food for protection and food for energy. This includes eating many vegetables. See month 1, week 2.

To meet her energy needs a child would need to eat this much boiled rice.



But she needs only this much rice when some vegetable oil is mixed in.



If her belly fills up before her energy needs are met, she will become thin and weak.

Instruction

1. Read and understand what causes malnutrition, how to recognize it, and what to do about it.
2. Discuss if it would be a good idea to bring all your children to the clinic for a checkup. The clinic has the obligation to help children develop well.
3. Follow up on your progress with the plans for the orphan children, and make plans for this month.

Homework

Maintain the garden. Follow up on the orphaned children.

Month 6

Second round of planning and planting

Week 2 – We plan for the gardens to have vegetables throughout the year

Lesson: The 2 weeks cycle

To have fresh vegetables all the year, you need to have plants in the nursery and plants at different stages of development in the garden. You can plan this by planting in the garden every 2 weeks. In that way, you will have some plants just planted, some in the growth stages, and some ready for harvesting all the time.

Now you have had experience with sowing seeds in the nursery and transplanting the seedlings (tomatoes, rape, and onions), direct sowing in the garden (beans), and planting vines (sweet potatoes).



Intercrop different vegetables

In this second round of gardening, you have the chance to make good plans based on your own experiences.

You can use the same raised beds, and your first compost heap is ready for use. It is a good idea to use intercropping with vegetables from different groups between each other, and to use crop rotation.

This time, you could rotate by sowing beans, and planting sweet potatoes in the other half of the garden. This will improve the soil, because the beans will bind nitrogen in the soil and the sweet potatoes will provide cover that shelters the soil from direct sun, and hinders weed growth.

You have the seeds for the beans, and the vines for the sweet potatoes. You can plant new rape by moving the young shoots that have come up under the old plants. You have seeds for tomatoes.

*Vegetable
groups*

Legumes	Green beans, cow beans, soy beans
Root crops	Onion, sweet potatoes, cassava
Leaf crops	Rape, amaranth (bondwe), pumpkin, cabbage
Fruit crops	Tomato, impwa (egg plant)
Herbs	Lemon grass, Artemisa afra

Maybe you want to add new plants this time. Cow beans, garlic, Chinese cabbages, amaranth, spinach, pumpkins, cabbages, and brinjals (impwa) are all healthy vegetables to add.

Start by adding just one or two new plants. Choose local varieties, and ask people who grow them how to do it.

Before you start planting and sowing, you should harvest the sweet potatoes and the onions.

Sweet potatoes

Loosen the soil with a strong garden fork to avoid having to pull at the plant and damage it.

Be careful not to hurt the root, as you cannot store damaged sweet potatoes.

Sweet potatoes can last for several months when stored properly:

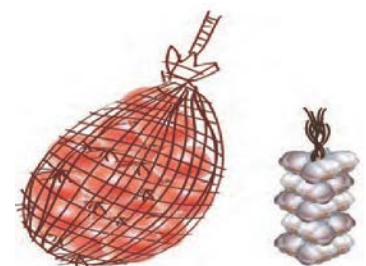
- ✓ Use fresh, fat sweet potatoes, newly harvested and with roots.
- ✓ Shake off the soil, but do not wash them.
- ✓ Cure the sweet potatoes for 1 to 2 weeks in a room of 24° and 27° Celsius with ventilation. The curing process creates a second skin that forms over scratches and bruises, allowing the sweet potatoes to last longer in storage.
- ✓ Keep the sweet potatoes from touching each other as they cure.
- ✓ After curing, throw away potatoes that appear bruised, rotten, or moldy.
- ✓ Wrap each sweet potato by itself in a sheet of newspaper, or an old brown paper bag.
- ✓ Pack the wrapped sweet potatoes in a box or basket. Place an apple in the box. The apple will help prevent the sweet potatoes from budding.
- ✓ Store in a cool dark room.



Take care when moving root crops

Onions

Harvest when tops have fallen over. Cure onions by placing in a single layer, or in a mesh bag in a dry, well-ventilated area out of direct sunlight for 3-4 weeks. Remove tops when fully dry. Save some onion plants to produce seeds.



Curing onions

Instruction

1. Read the text and discuss how to make your plans for the next round for the common garden, and for the backyard gardens and garden farms.
2. Harvest and store sweet potatoes and onions.
3. Give the food to the families who need it the most, or share it.

Homework

Harvest and store sweet potatoes and onions at home.

Prepare to use the compost next week and to make a new compost pile.

Month 6

Second round of planning and planting

Week 3 – What we take out of the soil, we replace with compost

Lesson: What happens in the soil?

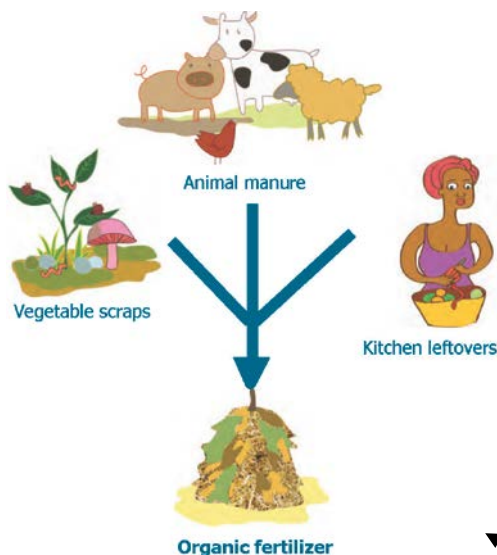
In most places where soil has not been cultivated, you will find an abundance of plants and soil that is soft and porous, e.g. in the woods or by the roadside. When soil is left to itself, it will be full of dead plants and dead animals, and the microorganisms are busy changing it all to soil. When soil is used for agriculture, the crop is taken away and thus all the nutrients that have been used to build up the plants, are taken away from the soil. To compensate for this, people have started to use fertilizer. This will return N (nitrogen), P (phosphorus) and K (potassium) to the soil. These are minerals and the plants will drink them with the water. But they do not provide any food for the microorganisms, so they do not produce soil. The soil becomes poor and dries out.



Soil rich in humus is porous

Humus is organic matter that is almost broken down. It is broken down by the microorganisms. Soil rich in humus has many more nutrients than NPK fertilizer has, and is very porous. It is very fertile, and it is easy for water to sink down and stay in the soil.

When we use the land for growing plants and take the crops away, we need to add as much organic material as we have taken away, to keep the soil fertile.



This is why we produce compost to mix into the soil.

Compost can be made from all types of organic material: Animal manure, vegetable scraps and kitchen leftovers. When we mix this to become humus in the compost heap, the process is faster than if we just dropped it on the land.

Ingredients of compost

Do not use cat or dog excrements, weeds with seeds, toxic plants like eucalyptus or walnut leaves, plants treated with poisons (herbicides), sick plants, glass, metal or plastic – this will not decompose; and leftover fats and meats will decompose slowly, stink and attract rats.

Before planting and sowing again, spread the old compost in the garden.

A 1-meter high compost heap gives 70-90 kg of compost.

You need 3 kg of compost for every square meter of bed. You do not have that much compost yet, so distribute it in the beds where you want to plant again.

Instruction

1. Read about how soil is made, and compare the soil in your garden with soil that has not been mulched. Form a ball of each type of soil and feel the difference.
2. Shape up the raised beds in the garden with a shovel.
3. Spread the compost evenly on the new beds.
4. Mix the compost with the top layer of the soil by turning it with a spade.
5. Level the soil with a rake.
6. If it is very rainy or very dry, cover the beds with mulch so that crusts do not form, or the compost is not dried out by the sun.
7. Make one or two new piles of compost. The more compost you can produce, the better for the soil.
8. Remember to water and air the compost.



Mix the compost with the top 30 cm of the soil.



Within a few days, there will be a great deal of activity in the heap. The microorganisms are transforming the scraps into organic fertilizer.

Homework

Apply compost in the backyard gardens and make a new compost heap.

Prepare for sowing and planting next week.

Repeat how to plant and sow by reading the text for next week.

Month 6

Second round of planning and planting

Week 4 – We plant and sow the second round of vegetables

Lesson: More about planting and sowing

You have prepared the soil well so that it is loose and spongy, and ready for the new plants to develop strong roots and grow. The raised beds are also ready.

Here is a reminder of what to do.

Transplanting plants from the nursery:

- ✓ Seedlings are ready for transplanting when they are 10-15 cm tall or have 4-5 leaves.
- ✓ Harden the plants:
 - Move the plants out of the nursery the last 4-5 days before transplanting.
 - Do not give water to the plants during the last 2 days before transplanting.
 - Give water the day you transplant.
- ✓ Transplant late in the afternoon.
- ✓ Be careful to get as much soil along with the plants as possible.
- ✓ Move the plants on a tray.
- ✓ Plant the plants as deep in the soil as they were growing in the nursery, tomatoes a little deeper.
- ✓ Plant onions with a distance of 5-10 cm with 50 cm between the rows.
- ✓ Plant tomatoes with a distance of 45 cm and 90 cm between the rows.
- ✓ Plant the new rape plants with 30 cm distance and 50 cm between the rows.
- ✓ Press the soil firmly around the plants.



Move the plants on a tray

Direct sowing of beans:

Mark the lines.

Make holes, 6 cm deep, with a distance of 30 cm.

Place 3 beans in each hole.

Keep 80 cm between the rows.



Place 3 beans in each hole

Planting of sweet potato vines:

Select healthy vines and cut in pieces, 30 cm long. Remove the leaves, except 4-5 on the top of the plant.

Plant the cuttings by covering the whole length with soil, so that only the leaves at the tip are sticking up.

Press the soil firmly around the plants.

The cuttings will grow roots at every leaf node.



Sweet potato vine

Cover the beds with mulch, compress the mulch gently, and give water.

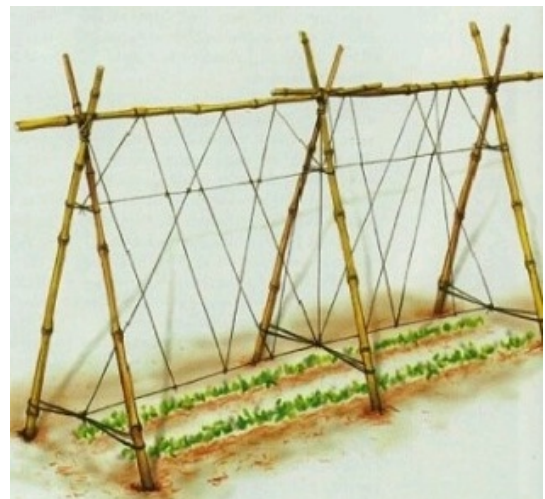
Take care of the plants:

After 5-6 days the first leaves will appear.

After a week, thin out plants that grow too close, and weed.

Both beans and tomatoes need something to climb on when they are growing. You can make tripods from tying bamboo sticks together at the top and place the legs around the plants. Tie string between the bamboo sticks. If needed, tie the plants to the tripods with pieces of string.

Tomatoes can also climb on dry bushy branches placed beside them; the branches should reach 30-40 cm above the ground.



Trellis for beans and tomatoes

Instruction

1. Repeat how to sow and plant.
2. Mark your plan out in the garden.
3. Transplant, plant and sow the second round of vegetables.
4. If you want to keep plants from the last round, leave them where they are and plant around them. Rape can continue to grow for 4-5 years and onions can only make seeds if you keep them for a second year.

Homework

Plant and sow in the backyard gardens, garden farms and nurseries. Water and weed.

Month 7

Taking care of the garden farms

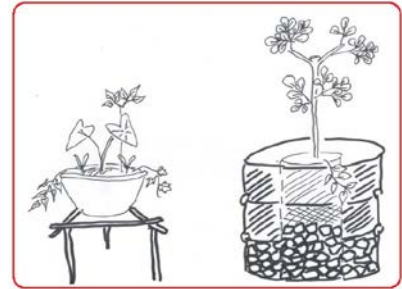
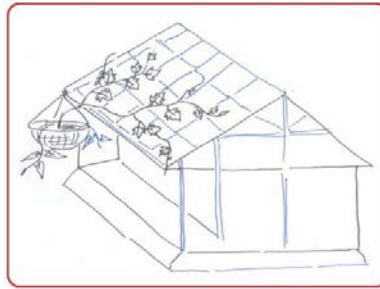
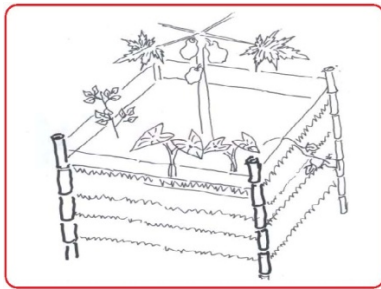
Week 1 – We learn about managing challenges

Lesson: How to be best prepared for things that can go wrong

We cannot prepare for any calamity, but we can use our experiences to prepare for things we know can go wrong.

Here is the beginning of a list of actions you can take:

- ✓ Always have seeds ready for a second planting or sowing, as there might be periods of draught or periods of flooding, that spoils the gardens.



Keep seedlings and plants out of reach of rising water

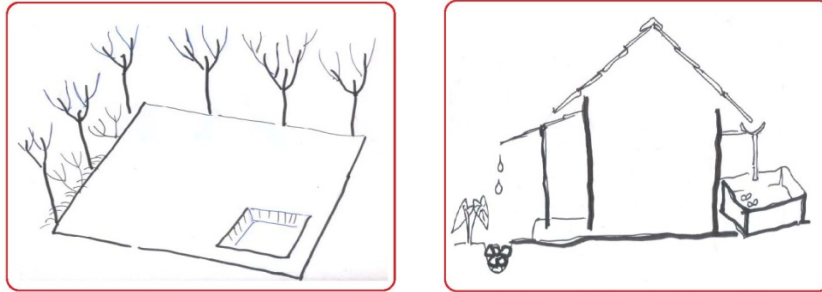
- ✓ If flooding is frequent, sow in a raised nursery, and maybe even in extra high beds or on a flat roof, and deepen the drainage channels.
- ✓ Keep the seeds in a place that will not be flooded, like a high shelf or hanging from the roof.
- ✓ If flooding is a constant problem, then maybe you need to move the common garden and the backyard gardens to higher lying area.



Collect wild plants and learn how to use them

- ✓ Collect wild plants to supplement the garden produce, and dry and store for bad times: African spinach, African nightshade, grain amaranth, baobab, marula, masau, stevia, wills melons, bambara nuts, moringa, resurrection bush, fever tea tree, devil's claw, sweet thorn, Bindura bamboo and wild or sour plums are just some of the common wild plants. Search and collect the local plants. Learn from the elderly women how to use them.

- ✓ Dry and store as many garden plants as possible.
- ✓ Store out of reach of rising water, maybe make a common storehouse higher grounds.
- ✓ Select the seeds from healthy plants and only seeds that are not damaged.



Saving water in ponds and harvesting water from the roof

- ✓ If draught is the problem, maybe you need to store water in tanks, harvest water from the roof, and use wastewater for watering.
- ✓ If you are lacking material for mulching, organic material such as wood chips from a sawmill, pine needles, coconut husk or water hyacinth can also be used.

Instruction

1. Discuss which calamities that occurs frequently in your area.
2. Discuss each scenario independently and what you could do to be better prepared.
3. Read the list of proposals above and discuss which could be useful.
4. End up by making your own long list of things that could be done, and discuss how you can work together on this.
5. It is a good idea to make detailed notes of what you have done in the garden so far, from starting the first nursery to the harvesting. Every region has its own conditions, and every garden farmer has to learn from his own successes and mistakes to become a skilled gardener.
6. Make a common list of successes and failures, and make use of them in the second round of growing vegetables.
7. Follow up on the orphan children and make plans for next month.

Homework

Share the discussion from today with your family, and decide which improvements you can make in your systems at home and how to do it. Take good care of the new plants in your backyard garden or garden farm.

Month 7

Taking care of the garden farm

Week 2 – We expand the nursery and use our own seeds

Lesson: More about raising nurseries

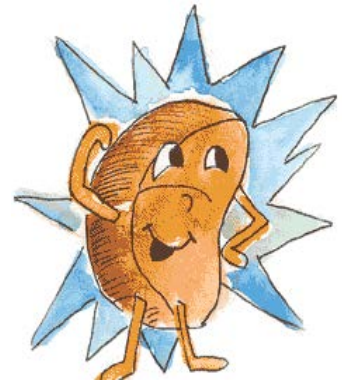
Now you have started to collect your own seeds.
There are different things to look for, to see if a seed is healthy:

All the seeds should look alike, meaning they will be of a pure quality, and not mixed with any other seeds.
They must be clean, without any foreign particles or weeds.

They must be free of diseases.

Most of the seeds should germinate when they have a suitable temperature and moisture.

The seeds should germinate quickly and the plants should be healthy.



You can test your seeds in this way:

Use 25 seeds, cotton and some newspaper



Place a tight layer of cotton on a plate, and cover it with a piece of newspaper. Add water to dampen it, remove excess water.

Place the seeds in an orderly fashion on the wet paper. Moisten it every day. Keep the plate inside the house in a warm place.

After 6 or 7 days count all the seeds that are germinating.

If 20 or more of the 25 seeds have germinated, it means that the seeds are healthy. If less than 13 of the seeds have germinated, and the plants look weak or are growing unevenly, the seeds are weak, and they should not be used.

In this case, try to get some good seeds from a neighbor or from the government extension service, and use them.

If you want to produce even better seeds, choose good seeds among your own, or new seeds, and choose a space in the garden a little away from other plants, to be used only for seed production. Again, you choose the healthiest plants and store the seeds from them.



Make separate beds for seed production



A seed should sprout and start to grow in 5-6 days

Instruction

1. Clean up the nursery and repair the shade, if needed.
2. Do not use the same trays as you used last time, as they can carry diseases.
3. Sow new plants in the nursery, using your experiences from the first time.
4. If you have chosen any new plants, make sure you have the right instructions on how to sow, or plant.

Homework

Test your seeds. Sow them or other seeds in the nurseries in the backyard gardens. Continue to water and weed the nursery and the beds.



Month 7

Taking care of the garden farm

Week 3 – We help the plants to grow

Lesson: Cultivation and pest management

What is cultivation?

It is bringing the soil close to the base of the plants.

What tool is used?

The hoe.

When do you do it?

On most plants it is done only once in the season, when the plants are fully-grown and strong.



Cultivating

What are the advantages of cultivating?

- It helps to control weeds
- It lets air into the soil
- It keeps moisture in the soil
- It helps to uphold the plants, making them more resistant to the wind and their own weight
- It minimizes the attacks of diseases



Correct use of hoe

What is pest management?

Pests are the small insects that reproduce fast and cause damage, because they eat the plants. There are many things that can be done to control pests. First of all, do not use chemical sprays as the first solution.

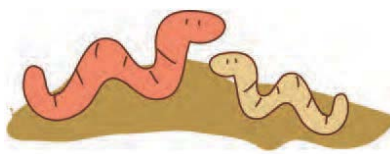
Prevent pests by using crop rotation and intercropping.

Remove all vegetable scraps from the field. Insects might hide in it. When used to make compost the insects will die.

Take good care of the vegetables with water, organic compost, weeding, cultivating and mulching.



Slugs



Worms and larvae



Aphids

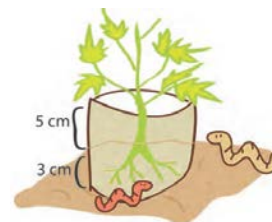
If there are more pests than the plants can fend off themselves, then you can:

Collect the insects: Cutworms, weevils, chinch bugs, beetles and other bigger insects are easy to collect. Collect in a bag and destroy them.



Use color traps: Blue, yellow or white plastic flags covered with used engine oil attracts the insects and trap them.

Grubs: Place a ring of cardboard around small plants; this will prevent grubs from eating the plants. When the plants has grown thicker, they can resist grubs.



Slugs: Place boards on the soil between the plants. During the day, the slugs will hide behind them where you can collect them easily.

White flies, aphids and thrips: Paint the inside of a shallow can bright yellow. Half fill the can with water and hang it on a pole among the plants. The insects will be attracted by the color, and will drown, when they fall into the water.



Spider mites, white flies and aphids: Spray with washing soap or liquid washing up soap. Mix 2 spoonfuls of soap with 4 liters of water. Spray the plants completely on the surface and the back of the leaves.

Aphids and small larvae: Spray with a concentrated soap solution.

Instruction

1. Read about cultivating and methods of pest control.
2. Cultivate the grown up plants in the common garden.
3. Look for insect pests and decide which methods to try.

Homework

Cultivate the plants in the backyard gardens. Scout for insects and try out some of the different methods for controlling them. You could engage your children in collecting insects and making traps.

Weed and water.

Carry out the planned actions for the orphan children.

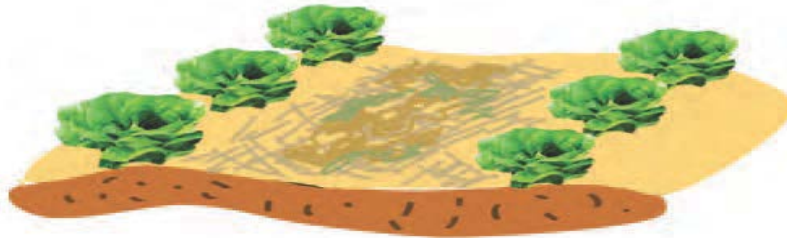
Month 7

Taking care of the garden farm

Week 4 – Our soil is covered all the time

Lesson: Why the soil should be covered and how to do it

When soil is left bare, it is dried out by the sun, washed away by rain and blown away by wind. Even the soil between the plants and the rows. When the soil is covered, called mulched, the mulch lying on top of the soil will keep the soil protected like a coat.



The advantages of mulching are:

- ✓ Weeds cannot grow because of the lack of light.
- ✓ The soil remains moist.
- ✓ The soil does not overheat during the day, or get too cool during the night.
- ✓ The plants' leaves and fruits stay cleaner, since mud does not splash during the heavy rains.
- ✓ Water from watering, rain, or morning mist, will stay among the plants and slowly seep into the soil, instead of running away or evaporating.
- ✓ No erosion from sun, wind and water.

What can be used for mulching?

You can cover the soil between the beds with any of these materials:

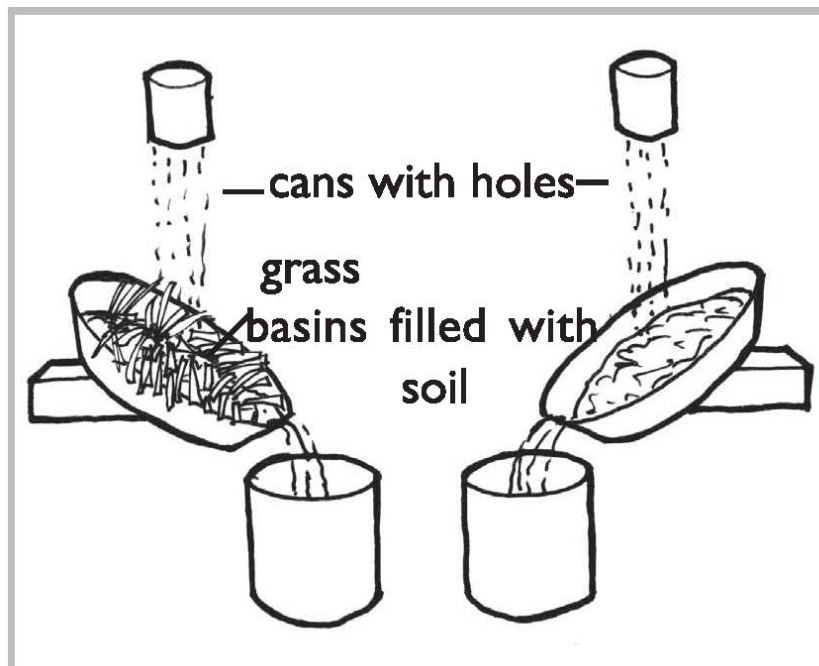
- ✓ Organic compost
- ✓ Black plastic
- ✓ Dried grass
- ✓ Newspaper
- ✓ Dry leaves

The best cover is organic compost. Place a layer of 5-10 cm between the rows and around the plants.



Mulch should not touch the stems of the plants.

Here is an experiment that shows how mulching works.



Fill two plates with soil.

Place two bricks or stones under the plates, as shown on the drawing.

Cover the soil in one plate with grass cut into small pieces.

Place 2 containers under the plates – use glasses or plastic bottles cut in half.

Water the soil in both the plates with water from a tin with holes in the bottom, like when it rains.

Compare the amount of water and soil that has run into the two glasses.

What can you see?

Instruction

1. Read about mulching.
2. Make the experiment.
3. Look at the common garden and discuss if it has enough mulch, or when to mulch again.
4. Decide which material to use for mulching. It can be grass cut from the roadside and dried, dry leaves or compost. (Do not use leaves from gum trees / eucalyptus, as they are poisonous).
5. Plan to always have material ready for mulch, and start collecting it.

Homework

Tell your families about the benefits of mulching. Show them the experiment. Look at the backyard gardens together with your families, and decide what to do to have the soil covered all the time.

Weed and water in the backyard gardens and the garden farms.

Month 8

Becoming wiser and using your experiences

Week 1 – We celebrate our garden farm results

Lesson: Listing all that we have learned and counting our produce

Here is a list of what you have learned so far, but it is probably much longer:

How to make a garden plan.

How to start up the garden by clearing the land and fencing it.

How to grow seedlings in a nursery.

How to sow, plant saplings, and plant vines.

The importance of keeping the soil healthy, and how to do it.

Why it is important to eat vegetables

- and much more



Hopefully, by now, all families in your group have a backyard garden, your whole family is engaged in taking care of it, and you have already experienced that eating from the garden keeps you and your family more healthy.

However, there is one health issue we have not yet discussed, which can also be addressed by growing plants.

That is malaria.

Malaria is spread by mosquitoes.

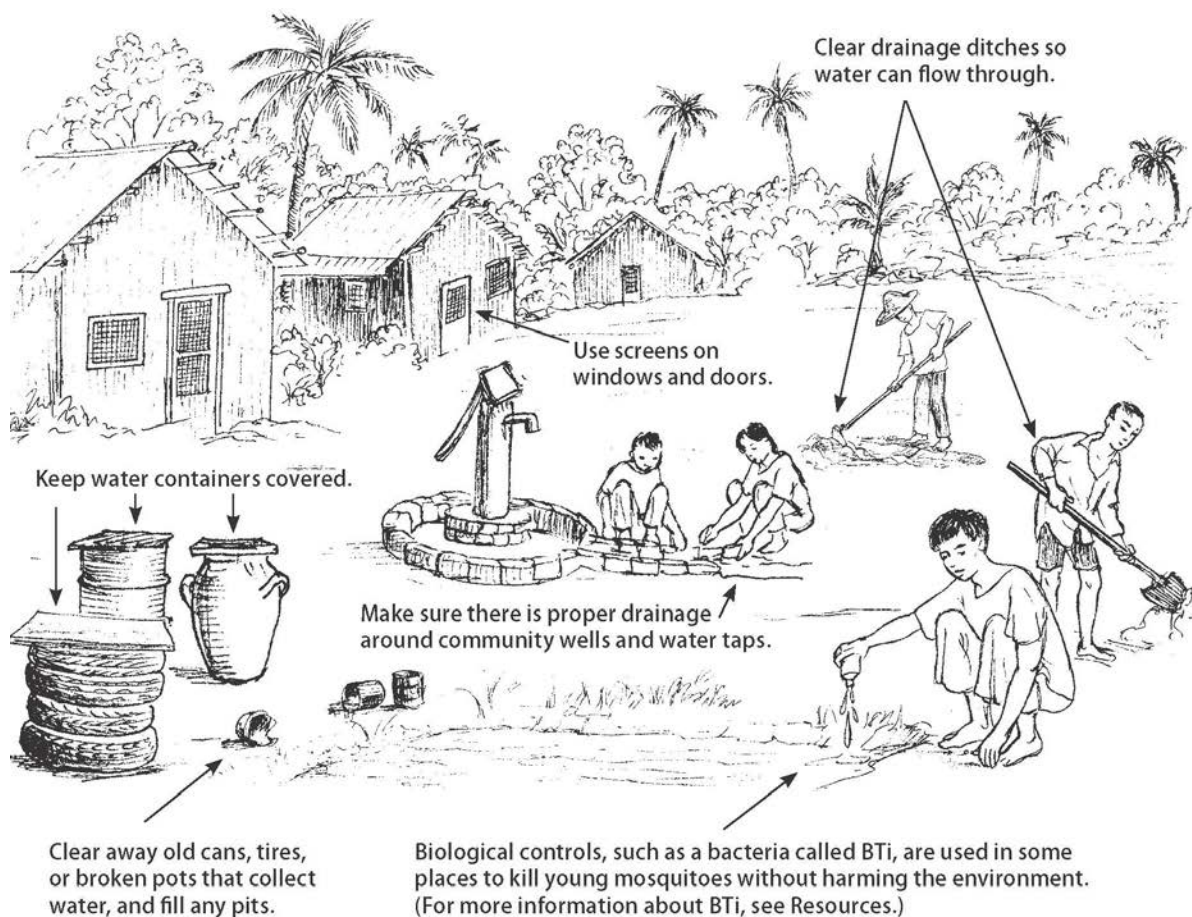
Therefore, it is important not to be bitten.

The most effective method is to sleep under mosquito nets at night, keep mosquitoes out of the house by using screens for the windows and doors, use repellants and wear long trousers and shirts with long sleeves in the evening.



Besides this, it is important to keep the mosquitoes as far away from your house as you can. Mosquitoes live in long grass and their larvae lives in stagnant

water. To get rid of mosquitoes you can cut long grass around the house, fill in water pits where mosquitoes can breed, and make sure that water is not collecting in empty cans or rubbish lying around. Mosquitoes do not travel far, so if you clean up regularly there is a chance of keeping them away.



Finally, you can plant lemon grass and Artemisia around your house. These plants have a scent that mosquitoes do not like.



Artemisia and lemon grass are common plants in Zambia.

← Artemisia
Lemon grass →



Instruction

1. Help each other to make a long list of all you have learned.
2. Celebrate your results with a cup of tea.
3. Follow up on your actions for the orphan children and make new plans.
4. Read about what you can do to get rid of mosquitoes.
5. Discuss the actions taken on the picture. Are they useful for you?

Homework

If you live in an area where malaria is a problem, discuss what you can do to get rid of mosquitoes, and take action at home. Send a delegation to the clinic to ask for mosquito nets.

Month 8

Becoming wiser and using your experiences

Week 2 – We make friends with good insects

Lesson: The work of bees, butterflies and other helper insects

Pollination is the process of pollen being transferred from the male part of a flower to the female part of a flower. Animals, birds, and insects that carry the pollen between flowers are called pollinators.

Flowers produce nectar, a sweet substance, to attract pollinators. These insects suck up the nectar, and while they do it, pollen from the flowers sticks to their legs and bodies. When the insects move on to the next flower, some of the pollen is left there, meaning the flower is fertilized and ready to set seeds.



Butterflies

Butterflies leave eggs and larvae on the type of plants they use for breeding new butterflies, and although the larvae feeds on the plants, it is only for a short time and will not cause much damage to the plant.

Butterfly friendly plants, usually produce clusters of brightly colored sweet smelling flowers and include asters, daisies, butterfly bush, butterfly weed, lantana and marigolds.

Honey Bees

Bees are called social creatures, because most bees live in colonies and rely on each other. Honeybees have a division of labor among the various “kinds” of bees in the colony. A colony can include one queen, many drones and many workers bees. Honeybees can also be cultivated in beehives, and bring in an income from the sale of honey.



Birds

Hummingbirds, honeyeaters and sunbirds have long beaks that can reach the nectar.



Other useful insects

Some insects like ladybirds and ladybird beetles eat aphids and in this way help to control pests.

They can be red, green and yellow with black spots.

Farmers are used to taking care of their soil, their crops, and their animals, but usually not of their pollinators. Bees and butterflies have just automatically done their job. Unfortunately, due to the use of chemicals on the farms and due to changing temperatures, the pollinators have problems in surviving, and in some areas, bees have totally disappeared.



Marigold, daisy and lantana

Instruction

1. Read about the pollinators, and why we need them.
2. Go out in the common garden together and count how many pollinators you can spot. Add them all together.
3. Discuss if it is a good idea to plant e.g. daisies, lantana, or marigolds along the fence of the garden to attract pollinators.
4. Collect the vegetables that are ripe for harvesting, and distribute them as you have agreed.

Homework

Tell your family about the pollinators and look for them in your garden. Weed, water and harvest your own produce.

Collect flowers and seeds of daisies, lantana, marigold or other local flowers to sow and plant in the common garden next week. Bring also lemon grass and Artemisia seeds and plants.

Month 8

Becoming wiser and using your experiences

Week 3 – We plant flowers to attract bees and butterflies

Lesson: Which vegetables need pollinators and which flowers do they like?

Not all crops need the help of pollinators. Most of the grain crops are wind-pollinated or self-pollinated. Bananas propagate from cuttings. Hybrids do not need help from pollinators, because hybrid seeds are always pollinated by the producers, and do not produce seeds. This is why farmers who use hybrid seeds need to buy seeds every year instead of using their own seeds.



Some plants, among them most grains, are pollinated by the help of the wind

Vegetables that need pollinators are: Watermelons, melons, cucumbers, squash, pumpkins, gourds, most fruit trees and berries.

Vegetables that can grow without pollinators, but will make better produce if pollinated, and might not produce good seeds without pollination, are: Beans, onions, eggplants, okra, potatoes, cauliflowers, pigeon peas, peppers, papayas, coconuts, sunflowers, flax and prickly pears.

Vegetables that are self-pollinating and do not need pollinators, are: Tomatoes, sweet potatoes, cobs, cabbages, leafy greens and carrots.



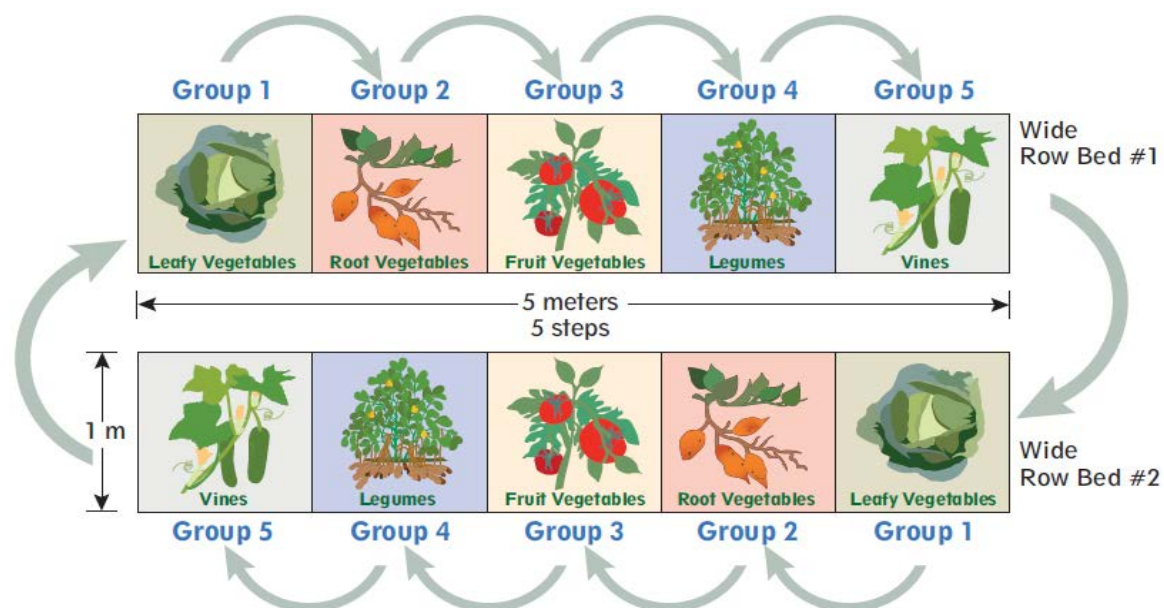
As a garden farmer, it is important to become good at growing your own seeds. It is a way of being in control of food security. With seeds in stock, you have a second chance if the vegetables are spoiled by the heat or floods. You do not need more money to start up the garden again.

Grow your own seeds

To plan for extended vegetable production, it is also good to plant flowers to attract pollinators. Besides, the scent of these plants keeps other insects away.

The common gardens and the backyard gardens are now at a stage where you have plants in the nursery all the time, and can add plants in the garden whenever the old plants are finished.

You have experience in planting and sowing, and taking care of the plants you started out with. It is a good time to add new vegetables in the garden. You should plan to have at least 8 different types of vegetable. Maybe you also want to extend the areas of the garden to be able to grow more, and maybe you can even sell some vegetables, and earn some money to pay for some of the cash expenses for the children.



You can use the picture above to plan on how to grow the different types of vegetables besides each other, and to make a system for changing what you grow in each single bed.

Instruction

1. Make your plan for how to develop the garden with more vegetables, choosing from all the groups.
2. Plant new vegetables where old plants are finished.
3. Plant flowers along the fence, and maybe between the beds.
4. Plant lemon grass and Artemisia to get seeds and plants for planting at your homestead.

Homework

Design your backyard garden or garden farm, as you want it to develop, expand, and replant where there is space for new plants.

Month 8

Becoming wiser and using your experiences

Week 4 – Nutrition and HIV/AIDS and TB

Lesson: The more fresh and colorful – the more nutritious

Mrs. Phiri's story:

“Vitamins and micronutrients helped me a lot.

I didn't know that I was lacking these things in my body. I had swollen feet and some rashes all over my body.

My friends told me to go to hospital, because they could see, that something was very wrong.

I went there, and the doctor just told me that I was lacking vitamins. I thought he was fooling around with me. He gave me some vitamins and mineral tablets, and it was a miracle to me, because they made wonders on me.

My feet became normal again within two weeks of taking the tablets. The rashes also disappeared. I realized that it was true that I was lacking vitamins and micronutrients.”



People suffering from HIV/AIDS and TB, often lose their appetites if they do not get enough healthy food. They also stop taking their medicines, because it is very hard for the body to absorb medicines, if these are not taken together with good food.

Then they lose weight.

All this leads to the body's defense against infections becoming weaker.

Then new infections occur, like TB, malaria, bacterial infections and worms.

This condition is very dangerous, especially for children.

When the body is weakened, HIV progresses faster and people with TB will die.

People living with HIV or TB, or both, need:

To be under treatment at a clinic, and take the prescribed medicines, and to take vitamin and mineral tablets. These are usually:

- Zinc 10 mg twice daily,
- A-vitamin 25.000 IU once daily,
- C-vitamin 500 mg twice daily,
- E-vitamin 100 mg twice daily and
- Selenium. 100 microgram twice daily



But on top of this, they need to eat fresh fruits and vegetables every day.

When a person lacks appetite, it is important to stimulate eating by adding many different nutritious foods.

Serving only nshima and vegetables without oil, or porridge made of mealie- meal, water and salt, will not do the trick.



This can be difficult if a family has little money.

This is another reason why the backyard gardens are very important.

Where to find the vitamins and minerals:



Zinc: Spinach, seeds from pumpkins, squash, sunflowers, flax, round nuts, beans, mushrooms.

A-vitamin: orange sweet potatoes, covo, spinach, carrots, squash, lettuce.

C-vitamin: lemons, red peppers, guavas, green peppers.

E-vitamin: Swiss card, spinach, kale, parsley, papayas, homemade oils made of sunflowers, coconuts.

Selenium: fish, wheat bread, sunflower seeds, mushrooms, brown rice, quinoa.

Eating these vegetables will not be enough; the vitamin pills are still needed. However, a diet with many different fruits and vegetables will help sick people to get their appetites back.

Instruction

1. Read about the importance of vitamins and minerals for people living with HIV/AIDS and TB.
2. Discuss your own experiences of providing food to people living with HIV/AIDS and TB.
3. Note the beneficial vegetables, and consider adding some of them to your garden, so you end up having plants from all the categories.
4. Continue to watch and develop the common garden together; fill up in the nursery, fill up in the garden, mulch, weed and give water.
5. When adding new types of plants, learn how to grow them from people who already use them.

Homework

Share your knowledge on the importance of vitamins and minerals that break the vicious cycle of malnutrition and HIV and TB.

Continue to take good care of your backyard gardens and garden farms.

Month 9

Harvesting, preserving and storing

Week 1 – We learn why some foods are good and some are bad

Lesson: Factory made foods and sugar

Warning! Most processed foods are a big threat to your health. Processed foods are premade foods you can buy from shops. It is all the soft drinks (Coca-cola, Fanta, Sprite etc...), chips, biscuits, bread, sweets, canned fish, canned beef and the like. Every food that comes in a jar, a box, a bag or a can is processed.



It is the way this food is processed, that makes it unhealthy. Chemicals are added to it, so that it can last longer without being spoiled. It is not fresh, and most of the vitamins and nutrients that were in the fresh foods have been lost in the process.

Factory made food is bad for your health



Fresh fruits and vegetables are good for your health

The sad truth is that most of the processed foods are bad for your health. The good part is that you do not need to eat it. Many of the processed foods are snacks, where you are much better off if you eat a banana or another piece of fruit, a carrot or a sweet potato instead.

To eat a balanced diet means to eat the right amount of food from the main food groups every day, so that you get the energy and the building blocks you need to build up a strong body.

One ingredient in your diet that you need to pay special attention to is sugar. The sugars you get from the different foods you eat are good for you, and they are part of a balanced diet.

But, it is not the same with white and brown sugar. The white and brown sugar is extracted from sugar cane, and refined by use of chemicals. When sugar is extracted and refined, it loses some of its natural elements, and becomes highly concentrated.

Natural sugar in the foods contains fibers that help your body to know when it has had enough food. Refined sugar has no fibers, and this makes it difficult for the body to feel when it has had enough. As a result, your body becomes over fed with sugar, but you are missing the healthy nutrients.

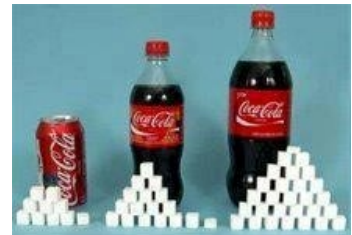
Excessive consumption of sugar can be harmful to your health. Children fed with too much sugar become hyperactive, and are very difficult to handle, as their bodies want more sugar all the time.

The contents of refined sugar is extremely high in processed foods, like soft drinks and sweets, and it can be dangerous to your health, if you consume it often and in big quantities. For example, one liter of Coca Cola has 40 cubes of sugar.

Eating too much sugar can cause many health problems, like obesity, diabetes, heart disease, and it can hinder your immune system from functioning well.

Eating a balanced diet and controlling your intake of refined sugar is two very important issues.

Instead of sugar, you can use Stevia. This is a natural sugar product.



Sugar in processed foods

Instruction

1. Read and understand why food processed in big factories is bad for your health.
2. Work in groups and try to remember what kind of processed foods you can buy in your local shop.
3. Discuss what type of homemade food you could use instead.

Homework

Tell your family why eating food processed by big factories is bad.

Prepare to bring pots and pans for next weeks' Lesson & Action.

Keep weeding, watering, mulching, making compost, filling up your nursery, transplanting and sowing.

Maybe you can also sell seedlings from your nursery to families who would like to make a backyard garden, or a garden farm.



Month 9

Harvesting, preserving and storing

Week 2 – We cook in a way that preserves vitamins and minerals

Lesson: Cooking lesson

A simple, cheap way of preparing vegetables is by cooking them. This will preserve their nutritional values. Hard frying spoils the nutrients.

There are different ways of doing it:

1. Boiling: Wash the vegetables, cut them into small pieces, put them in boiling water and cook until they are soft.
2. Sauté: Cook in a small amount of fat over a high heat making sure that the food does not stick to the pan, by making it “jump” in and out of the heat.
3. Grilling: The food is cooked over hot charcoal on an open fire. The food is placed on top of the burning charcoal by using a wire mesh. This method can be used to grill steak, chicken, fish, sweet potatoes or potatoes.
4. Stewing: Food is cooked on a low heat, using a lot of liquid. All the food is cooked together at the same time in the pot. Mixing garlic, ginger, salt and different vegetables together makes stewing a good method of cooking.
5. Simmering: This is a common term used in everyday cooking. It is a very important method. Simmering means preparation of food at a soft boil rather than a rolling, bubble-breaking boil. Many foods require a cooking process that includes simmering.



The trick is not to overcook vegetables, because this will destroy all the nutrients. It is a good idea to re-use the boiled water from vegetables in other foods such as soups or relish, instead of throwing it away.

All vegetables have to be washed just before cooking. Some can be eaten raw, that is also healthy if they are properly washed.



Cooking by using different methods also adds to making the food inviting.
Here are some recipes you can test:

Sweet potato porridge with peanuts – serves 4

Ingredients:

3 medium sweet potatoes
Water (or milk)
1 cup of peanuts roasted
and peeled

Method

Wash the potatoes and cook
in a little water for a short time.
When the potatoes are cooked, purée and add
powdered roasted peanuts, mixing well.



Blackjack with tomato and onion – serves 4

Ingredients

3 cups blackjack
1 onion
1 cup mushroom
1 tomato
1 cup moringa leaves
3 cloves garlic
2 tablespoon oil
Ginger plus ½ cup water

Method

Boil water with salt.
Add blackjack.
Boil blackjack until done.
Prepare sauce with oil, tomato, onion, garlic and
ginger.
Add blackjack, mushroom and moringa leaves to
the sauce.



Tomato and onion salad - serves 4

Ingredients

3 tomatoes
1 onion
1 cup moringa leaves
Salt

Method

Cut tomatoes and onion
in rings.
Place them in a bowl and add
moringa.
Mix well and add a pinch of salt.



Instruction

1. Read about how to cook without losing nutrients.
2. Divide into groups, and try out the 5 different ways to cook and the 3 recipes.
3. Share other good recipes with each other.

Homework

Tell your family how to cook without losing nutrients, and serve them many new dishes. Prepare to share your experiences with good storage systems at the next Lesson & Action.

Month 9

Harvesting, preserving and storing

Week 3 – We share systems for storing vegetables

Lesson: Good storing systems

The garden is a good place to keep vegetables fresh!

To always have fresh vegetables on the table, you can leave them in the garden and only harvest what you need.

When many different plants are grown, there is a greater chance that some of them will give yields and the food will be more nutritious because it is varied.

On the other hand, to have vegetables in store for periods with little food due to rain or heat, it is a good idea to make good storing systems and get experience in how the vegetables react to storing. You will always need to improve your methods, and find out what went wrong when something does not work. There will also be many traditions for storing food, some of which are still in use, and others, which can be brought back to use.

In month 5, week 3, we looked at some general principles for storing vegetables.

Here we will look at some methods that might be useful.

Fermentation

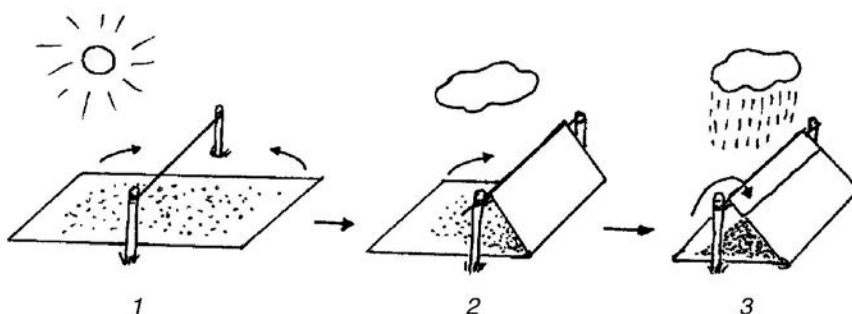
Fermentation makes food more nutritious and reduces diarrhea. Fermentation is done by introducing microorganisms, which cause chemical changes in food.

The acid produced during fermentation also helps to conserve foods.

Fermentation is used to make porridge, nshima (sadza) and mahewa.

Drying

Many vegetables are good for drying. They should be cleaned well and cut into small pieces.



Drying food on a plastic or canvas sheet that can be folded over a string in case of rain

To keep the vitamins and a fresher look, it is good to blanch the vegetables before drying.

Blanching

Boil water with salt. Put the vegetables in a clean cloth or basket.

Hard vegetables are dipped in boiling water for 3 minutes.

Softer vegetables, like spinach and moringa leaves, are dipped for 2 minutes.

Immediately after, dip in clean cold water.

Spread on trays, dry until they are crisp, and pack them.



Dip in boiling water, dip in cold water, shake and dry

Storing in earthenware pots and gourds

Earthenware pots or gourds are very useful for storing small quantities of beans or seeds. By treating the pot or gourd with paint or linseed oil, and sealing the lid with mud or cow dung, the pot can be made airtight.



Instruction

1. Read about drying and storing.
2. Share local methods of storing vegetables.
3. Blanch some sweet potatoes and covo, make a model of a dryer and dry the vegetables.

Homework

Decide how much produce to leave in the garden for daily consumption, and how much to store.

Engage your families in drying and storing vegetables. Bring tests of your preserved produce to the next meeting. Also, bring pickles.

You could invite some women with experience in making pickles to participate in the next Lesson & Action, and teach you how to do.

Month 9

Harvesting, preserving and storing

Week 4 – We share methods for preserving vegetables

Lesson: Preservation methods

Food preservation includes many different methods used to prevent food from spoiling. Some of them are canning, pickling, drying and smoking,

Here are some examples of preserves.

Whole tomatoes.

Tomato sauce.

Jam from tomato & strawberry.

Or strawberry & melon.

Pickling:

Cucumber, hot pepper,
cauliflower, eggplants, carrots,
cabbage, small onions, mangos.

Here is a recipe for fresh strawberry
jam:

4.5 kg fresh strawberries

3.5 kg of sugar

Put all the strawberries and the sugar in a large pot and leave it overnight.

Next morning, stir it with a wooden spoon; put to simmer on low heat while stirring constantly until it comes to the boil.

Cook until it thickens (1- 1 ½ hour)

When the jam is thick, pour it into clean glass jars. Seal and store until you want to use it.

Other fruits and local wild fruits can also be used, and you can make jam from mixed fruits.





Cooking demonstration - how to make pickles

Instruction

1. Make an exhibition of all the produce you have brought from home.
2. Those of you who made the preserves can explain how you made it.
3. Share some taste samples.
4. Let someone do a demonstration of how to make pickles in the local manner.
5. Discuss if preserves are something you could sell. In many countries, homemade jams and pickles are very popular.

Homework

Make a status of your backyard garden or garden farm production, and discuss in the family how to go ahead. Should you add more varieties? Should you make the garden bigger? Which produce could you sell if you produced more of them, and where could you sell it? If your backyard garden is very small and made in boxes, how could you expand it? Could you hang more pots on the wall, or along the roof?

Is there a space in the town you would be allowed to use for a bigger common garden?



Urban vegetable garden

Month 10

Selling vegetables

Week 1 – How to sell a produce

Lesson: What do you have for sale, and where to sell it?

When you plan to sell a produce, you have to consider these issues:

Do you have something to sell that other people want to buy?

Do you know how much you can charge for the produce?

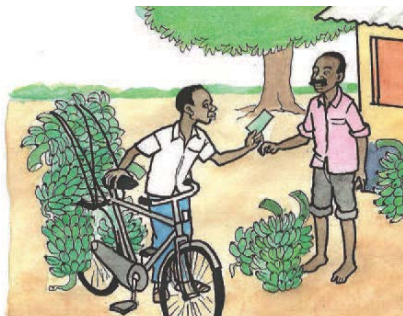
Where can you find the customers?

In today's lesson, you will discuss these points and do some work to find the answers.

The first point, what do you have to sell that other people want.

You know which vegetables you are growing, but how much do you actually have for sale?

Before the next lesson, you should agree with your family on how of the different vegetables you need at home, and how much you can sell, and bring a list along.



How much do you have for sale and what is the smartest way of selling?

Do you know how much you can charge for the produce?

Prices on vegetables can change a lot over the year, and according to how much there is for sale. In your case, any money you can get for your produce is a cash income, as you do not need to pay any laborers or use money for input in the garden. In this way, you are in a good situation.

It is a good idea to visit the closest places where vegetables are sold, and get to know what produce is for sale and the exact price of each vegetable. When you know that, it will be easier for you to plan what to sell and what to keep. Maybe you can also get some good ideas for new vegetables to add.



Should you sell directly from the garden, or is there a shop you can deliver to?

Finally, where can you sell your produce?

Will it be possible to deliver the vegetables to a local shop, or to a supermarket in town? Should you just put up a board and sell from the garden? Are there any families who would like to get a basket with mixed fresh vegetables delivered every 2 or 3 days? Is there a place where you can set up your own Garden Farming Action Group market, and how often should that market be open?

Instruction

1. Read the questions and discuss in smaller groups, to get an idea of what the best answers would be.
2. Visit the nearest shops or market together and find the prices.
3. Make a list of possible ways to sell the produce.
4. Follow up on your actions to improve the life of the orphan children, and make the detailed plans for this month.

Homework

Prepare well for next week's Lesson & Action, by discussing with your family what produce you can possibly sell and how much.

Get hold of as many prices as you can from vegetable outlets. Ask families you know if they would like to buy vegetables on a regular basis.

Continue to take good care of your common garden, backyard gardens, garden farms and your produce.

Month 10

Selling vegetables

Week 2 – We plan for selling vegetables

Lesson: What to eat and what to sell

You have been working to find the answers to the questions from last week, and you are bringing them for this lesson.

The first question was how much produce you actually have for sale. You have discussed this with your family. Now you need to get the kg on the table and discuss the best way to sell. Is it possible to make bigger deals if you clap your produce together, or is it better just to sell from the garden to people passing by, or organize home delivery of mixed vegetables to families who sign up for that. If you promise to deliver a certain amount of vegetables, you need to calculate that you will be able to do it.



What to use, and what to sell?

The next question was how much you can charge.

This needs to be worked out from the prices other producers sell for, and how the quality of your produce can compete with others' produce.

Based on your investigations, make a proposal for how much to charge per kg or bundle, or in whatever units the vegetables are sold.

The last question was where to sell the produce.

Discuss the options according to the amounts you have for sale. There are many possibilities and you will earn most from choosing the most suitable.



Selling from home

If you sell directly from your garden, you can sell fresh produce, and there is no issue of transport and causing damage to the goods. On the other hand, if your garden is not near a road, there might not be many people passing by.



Selling from the roadside

If you make a common sale from a boot on a main road, you could get more customers. On the other hand, there is

transport to get the vegetables there, and there is a risk that you will not sell it all, and the leftovers will be spoiled from being out all day.

If you sell to a local shop, you will get less for the produce than if you sell it yourself. But, by doing this, it is not your problem if all the vegetables are sold.

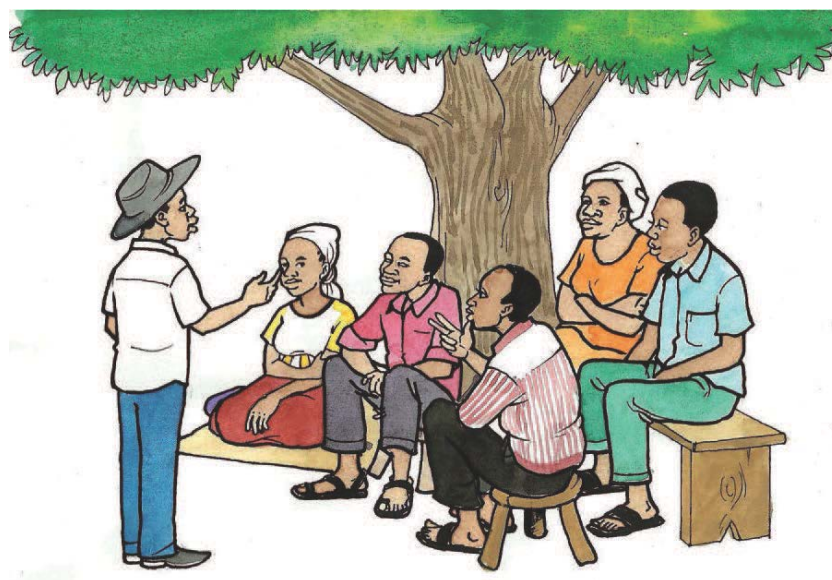
If you sell to a supermarket, it will possibly include longer transport and a bigger demand for delivering of certain quantities at agreed times.



Discuss all the possibilities. Maybe you need to try them all to find the best solution.

Selling to a shop

Agree to celebrate the end of the first year of the Garden Farming Action Group program, by making your own 'Farmers' Market' and inviting your friends and neighbors to participate. If this is a possible way of continuing to sell vegetables from the gardens, you could make it a tradition to have the Farmers' Market every month.



Instruction

1. Discuss your options for selling vegetables by following the points above.
2. Agree on what to try.
3. Agree to celebrate the first year with your very own Farmers' Market.

Homework

Invite your family to participate in selling produce, and preparing the Farmers' Market. Come with good ideas for where, and how, to make the market.

Month 10

Selling vegetables

Week 3 – We prepare our own Farmers' Market

Lesson: Ideas for the farmers market

You could look at the Farmers' Market as a way to promote your produce, and perhaps make agreements with people who would like to get fresh vegetables. To promote a produce means to make the produce visible, and tell people about its qualities.

You could use the opportunity to tell people about vitamins and minerals, why they are very necessary for all people, and especially for people living with HIV. You could also develop your own 'Trade Mark' by the way you pack and present the vegetables.

Here are some pictures for inspiration:



You can add value to your produce by presenting it in an inviting wrap



All the packing material above is made from natural waste products.

Wrapping can protect the produce and make it look interesting.
You could also sell healthy snacks. Here are two examples of recipes:

Healthy snacks

Moinmoin (steamed bean flour cakes)

Ingredients

Bean flour
Water
Cassava flour (if necessary)
Pepper, ground
Onion, ground
Salt (optional)
Banana leaves
Dried fish or boiled eggs (optional)

How to do:

1. Mix bean flour with water to form a paste. (A little cassava flour can be used for binding the mixture.)
2. Add pepper, onion and salt (and other ingredients, if desired) to paste.

Sweet potato pastry

Ingredients:

Sweet potato (preferably yellow-fleshed), grated
Sugar
Some wheat flour
Pineapple juice or coconut milk (optional)

How to do:

1. Mix ingredients together.
2. Bake as you would other biscuits.

Ask your children and some of the teachers in the school to help with making posters on nutrition.

Instruction

1. Make the final decisions and agreement on how to make the Farmers' Market:
 - Where can it be held?
Maybe at the school ground or outside the church.
 - What can be used as tables for presenting the produce?
Tables from the school, empty handcarts, or doors placed on tripods.
 - What time should it be open?
 - Who shall make the welcome speech?
 - Maybe there should be some songs for the opening?
 - What to sell? The vegetables, of course, and maybe seedlings and some healthy snacks.
 - How to invite people?
2. Make sure you have remembered all the tasks. There will probably be more than are listed here.
3. Agree on all the tasks, and who will do them.

Homework

All that you have agreed on. Get help from everyone in your family.

Month 10

Selling vegetables

Week 4 – We open our first monthly Farmers' Market

Lesson: Selling healthy food to our neighbors

This is the last day of our training program as the Garden Farming Action Group, and the day we are celebrating our first Farmers' Market.

Everything has been prepared and put in place. We have borrowed the school ground and the tables from the school, the children have made nice posters about the need of eating vitamins and a balanced diet. They have also made a drawing of a plan for a backyard garden. We have made exhibitions of all the vegetables we are growing, and booths for selling some of them. There are also seedlings and snacks for sale.

The whole thing looks pretty good. Now it is up to us to convince people to buy something.



Our first Farmers' Market

The market was open from 9.00 to 14.00, and many people came. Most of them also bought something. A few families agreed on the system of getting a basket full of fresh vegetables twice a week. This was a good beginning.

When the market closed, we cleaned up and went to Ms. Maria's place to have a meeting to conclude on the program and the event.

All our families have now had backyard gardens for some time, and all have managed to grow something. Most could also feel improvements in their health, and those of their family members. But when we discussed how to continue, some members felt that it was too difficult to maintain the gardens, and to manage the tasks in the common garden.

We discussed this issue backwards and forwards, as most of the members thought it would be a bad idea to stop growing vegetables. A neighbor of one of the families that wanted to stop suggested that the problem was that their children were not involved in the running of the garden. That particular family had three of their own children, and two orphans. These children were always roaming around on their own, not doing anything useful. It was proposed, that three of the neighboring families should meet, including all the children, and have a discussion on why it is important to stick together in the present situation, and agree with all the children on the work they should do.

Instruction

1. Meet in the Garden Farming Action Group to conclude on your experiences.
2. Discuss how to continue to stick together in the running of the common garden, and the backyard gardens.
 - How many want to continue?
 - Should you split into two groups and add new members to each of them?
 - Maybe you could start again on all the Lessons & Actions, to repeat what you have already learned, and give the new members a good start.
 - Should the backyard gardens be bigger this year?
 - Should the Farmers Market continue? How often?
 - Should you organize common sales or just sell your own produce?
 - Is it a good idea to grow many different vegetables, and exchange with each other?
3. Make your conclusions on each of the points and many other points you have put up.



When we go together to find solutions, we find good solutions

Homework

Whatever you have agreed on in the meeting.

The production of this Program Manual has been assisted by use of material from the following sources:

FAO

A vegetable garden for everyone
Improving nutrition through home gardening

The GAIA-Movement

40 Green World Actions

Hesperian Foundation:

A Community Guide to Environmental Health

Humana People to People:

Food For Knowledge Newspapers 1-4

Ministério da Saúde, Mozambique:

Manual de Implementação do Projecto Nutrição
Orientação para Introdução do Pacote Nutricional Básico para Acs –
Manual do Participante

Research Institute of Organic Agriculture FiBL

African Organic Agriculture Training Manual

UNDP

Manual on Home Garden for East & South Coastal Plains Agro-Climatic
Zone



CONTACT DETAILS

DAPP Headquarters,
11 Luneta Road, Northrise,
P.O. Box 70505, Ndola.
Tel +260 212 640057/59.

DAPP Partnership Office,
4 Katima Mulilo Road, Olympia,
P.O. Box 37661, Lusaka.
Tel. +260 211 293604.

Email: info@dappzambia.org
www.dappzambia.org



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