TRUTH CENTERED TRANSFORMATION

MODULE

AGRICULTURE TEACHER GUIDE

Truth Centered Transformation is a ministry of Reconciled World. Learn more at tctprogram.org.

Reconciled World

Agriculture:
Sample Schedule for a 3-day Training

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<tr><th>TIME</th><th>DAY 1</th><th>DAY 2</th><th>DAY 3</th></tr>
<tr><td>8:00-9:00</td><td>Welcome, worship, review previous training</td><td>Worship, prayer for TCT, review Day 1</td><td>Worship, prayer for transformation review Days 1&2</td></tr>
<tr><td>9:00-10:30</td><td>Lesson 1: The Earth Is The Lord’s</td><td>Lesson 5: Caring For Our Soil</td><td rowspan="2">Lesson 8: Pest Control (9:00-11:00)</td></tr>
<tr><td>10:30-11:00</td><td colspan="2">Break</td></tr>
<tr><td>11:00-12:30</td><td rowspan="2">Lesson 2: People’s Role In Creation</td><td rowspan="2">Lesson 6: Nutrients For Growing Plants</td><td>Break</td></tr>
<tr><td rowspan="2">Lesson 9: An Integrated Farm (11:30 -13:00)</td></tr>
<tr><td>12:30-13:00</td><td>Sharing, prayer, problem solving*</td><td>Sharing, prayer, problem solving*</td></tr>
<tr><td>13:00-14:00</td><td colspan="3">Lunch Break</td></tr>
<tr><td>14:00-15:30</td><td>Lesson 3: The First Farmer</td><td>Lesson 7: All-Year Food Gardens</td><td rowspan="3">Lesson 10: Working Together To Glorify God (14:00-16:00)</td></tr>
<tr><td>15:30-15:45</td><td colspan="2">Break</td></tr>
<tr><td>15:45-17:15</td><td>Lesson 4: God Heals The Land</td><td>Sharing, prayer, problem solving*</td></tr>
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*Let each participant share about their lives and how TCT is going. Then, let the group pray for them and spend time problem-solving with them as needed.

Special Facilitator Note

There are ten lessons in this module. The first four lessons provide a biblical foundation for farming. Because agriculture practices vary from one culture, climate, and location to another, the farming skills in this module only cover common topics such as soil, nutrients, gardens, pests, and livestock. These topics can be applied in many different environments, yet even these lessons may need to be adapted in your area.

We used principles from Farming God's Way, Natural Farming, and Creation Care, and we received input from others more qualified in Agriculture to develop this module. However, we are not agriculture experts. Please review lessons 5-9 and use a local expert to adapt the materials as needed for your context. The last lesson will provide time to make a plan to use some of the skills taught in this module or get more education from local experts, governments, or other organisations.

If your communities do not grow crops or raise animals, then you may want to replace this module with another module on economic development of small businesses.

Lesson 1: The Earth is the Lord's

Main Ideas

1. Our land and all that is in creation belong to God, and He enjoys all of His creation.
2. We are to take good care of our land because it belongs to God.

Materials

1. Blank cards/paper (10-20 per group)

Introduction - 10 min

This module is about Agriculture. During these lessons, we will learn what the Bible teaches about farming and agriculture and about God's role and our role in stewarding the land.

LARGE GROUP DISCUSSION

- How are you involved in farming? (have a farm, grow some crops, sell crops, etc.)
- Who owns the land you farm? How did they gain ownership of that land?
- Why is land valuable?
- What do people believe about the land in the community? Is it fertile? Is it considered to be cursed?

Land is valuable in almost every place in the world. It produces food, it is home for livestock, and we build our homes on it. Land is part of God's creation and the Bible has a lot of wisdom to teach us about the value and purpose of it.

To really understand the Biblical perspective of the earth and all that is in it, we need to understand the differences between what the Bible says and how our cultures look at and treat the land.

The Earth Is the Lord's - 55 min

SMALL GROUP ACTIVITY

***Facilitator**: Give each group 10-20 blank cards to write or draw on for this activity.*

In your groups, identify ALL the things that are needed in farming and agriculture like:

- Resources
- Tools and equipment for each season
- Things that are needed for crops to grow

1. Write or draw one idea on each card.
2. Then go through your cards and sort them into two piles: one pile of all the things that belong to God and the other pile of things that belong to humans.

REPORT BACK

- What is in your pile of things that belong to God?
- What is in your pile of things that belong to humans? Did you find anything that doesn't belong to God?

LARGE GROUP DISCUSSION

Read Deuteronomy 10:14 and Psalm 24:1.

- Who does the Bible say owns all things? What does this mean?
    - *God does. God created it and everything ultimately belongs to Him. He trusts us to take care of His creation, but it is His.*
- If this is true, then who really owns the land you farm? Who owns the tools?
    - *God does.*

Read Genesis 1:1-10, 31.

- How do you think God feels about His creation? About the land you farm?
    - *He called all of His creation good in Genesis 1.*
- How do you think God wants us to think about His creation?
    - *We should be thankful for it as a good gift.*
    - *We should think of it as good.*
- How do you think God wants us to treat His creation?
    - *He wants us to take care of it, steward, and nurture it.*
- Do we currently treat creation as if it is highly valued by God?

SMALL GROUP DISCUSSION

- What are some of the ways that you would treat your land, home, and everything you have differently if you believed it belonged to God and was highly valued by Him?

LARGE GROUP DISCUSSION

Facilitator: *Read the following story.*

Three Farming Families

In one community, the people were all farmers. Most of the families had small vegetable gardens to feed their families, but most of the land was used for growing two types of crops that were easy to sell. The land was in the mountains and was difficult to farm. At the end of each day it was common to hear people say, 'This land is worthless except to keep us poor people from dying.' Here is the story of three farming families in this community:

The first family worked harder than the rest. The father wanted to grow as many crops as possible every year, so he decided to cut down all the trees on his land to increase his farming area. He also found a way to get enough water for the new land by diverting some of the water from the irrigation of his neighbour. He heard stories from other communities about how to use chemicals to kill pests and increase crop production. He said he would try anything if it would mean more crops and less work.

The second family noticed the decrease in water in one area of his land (because his neighbour was diverting water to his own property) and decided to not plant in that area anyway. He reasoned that it had produced many crops for six years and it might be best to let it rest for the year. Although it made his farming area smaller, he trusted God would provide. He and his wife prayed for God's blessing on the crops each year, and they always gave some of their crops to those in the community that had a need. He and his children worked in the fields every day carefully planting and weeding. Together they prayed that God would give them wisdom to know what to do and not do. They consulted with experts in the area and learned that they needed to plant some crops to put nitrogen back into their soil. So, they mixed some beans in with their other crops to improve their soil. They thanked God for everything—the land, the crops, the ability to work, the rain, and the sun.

The third family in the community rarely spent time caring for their land. They told everyone that their soil is the worst in the community. Their animals were destroying the land and their water source was contaminated from human waste. They planted the one crop that took the least effort to harvest each year. Most years they

didn't get enough harvest for their family to live off for more than six months. Eventually they sold their land to one of their neighbours and moved to another place.

- Who acted as if God owned their land?
    - *The second family - farmer, wife, and children.*
- What did they do that demonstrated that they understood God ultimately owned their land?
    - *Prayed for wisdom.*
    - *Prayed for the crops.*
    - *Trusted God to provide for them.*
    - *Gave some of the crops for others in need.*
    - *Sought advice for how to use their land well.*
    - *Planted nitrogen rich plants to restore the land.*
    - *Thankful to God for everything.*
    - *Worked hard on their land.*
- How was that different from the way the others acted and what they believed?
    - *Believing the land was worthless.*
    - *Doing anything, including things that hurt the land, to increase the crop (cutting down all the trees, using chemicals, overworking the land).*
    - *Taking from others to get better personal benefit.*
    - *Not caring for the land.*
    - *Letting the land get polluted and be destroyed.*
    - *Doing things the easy way.*
- What are some other examples of how we would behave differently if we knew that God owned our land and everything we have?
    - *Give a portion of our harvest back to God.*
    - *Care for the land the way God cares for us.*
- How would this affect the way you farm knowing that God owns everything?

God is the Creator of all things and everything belongs to Him. Our land has value because it is part of God's creation. Therefore, God's land is worth investing in even if we don't know the outcome. When we care for God's land and all of creation, we are honouring God.

Conclusion and Application **- 5 min**

This week, take time to notice God's creation. Look for things that are beautiful and thank Him for these things. As you enjoy the beauty of the world God has made, ask Him to show you how you can look after it better as a way to show your appreciation for His beautiful creation that He has made for us to live in.

Lesson 2: People's Role in Creation

Main Ideas

1. God intends for people to rule over, care for (nurture), and steward all of creation.

Materials

1. Visual Aids
   a. Who Rules Over Creation? *(if using it as a role play)*
   b. Creation cards *(one set taken from Module 3)* - make one set for each group
2. One object of personal value (see Introduction)

Introduction - 5 min

Facilitator: *Bring something with you that has value to you—maybe something that has been passed on through your family or a cherished possession made by someone special to you. Show the valued object to the group and share the story of how you came to have it, why it is important to you, and what personal value it has to you. Then ask one person in the group to come up. Hand it to the person and ask them to take care of it. Thank them for being willing to take care of it. You will come back to this later in this lesson.*

We are Stewards of God's Creation - 25 min

LARGE GROUP DISCUSSION

Read Genesis 1:26-28.

- How is Adam's role different from all other parts of creation?
  - *God made Adam to rule over all of creation—animals, birds, fish, plants, etc.*

- How does God describe Adam's role to care for creation? Using your own words, describe what these words mean?
  - *To rule over it—to have authority over it.*
  - *To fill the earth—nurture, care for, protect and develop it.*
  - *To subdue it—to manage it and have dominion over it.*

In the Bible, we see that we have been given responsibility to look after, protect, and rule over creation.

LARGE GROUP ACTIVITY – STORY OR ROLE PLAY

Facilitator: *You can read the* ***VISUAL AIDS: Who Rules Over Creation*** *story or have volunteers do a role play. For the role play, earlier in the day, ask three to four people to play the role of the farmers (men, women, and children) and two to three people to play the role of the rats. Using the* ***VISUAL AID: Who Rules Over Creation****, read the story and ask the volunteers to act it out as you read.*

God gave humans authority and the ability to rule over creation with wisdom by nurturing it, protecting it, developing it, and enjoying it. Many people believe that, instead, humans are ruled by nature and that we are at the mercy of whatever happens in creation.

Who Rules Over Creation?

In a village in the mountains of South America there was a common problem that the people faced. For generations, the people planted and harvested corn. Every day the men, women, and children went out to work the fields.

("Farmers" should act out all the work that it takes to prepare, plant, and harvest the corn). They prepared the soil. They carefully planted the seeds. They made sure the seeds had enough water and nutrients so they would grow.

Farming was hard work *(The men sweating and wiping their brow, the women having sore backs, and the children complaining of being too tired)*. This took everyone's help, so often the children couldn't go to school. No matter how hard they worked, it always seemed like they didn't have enough to eat throughout the year.

Meanwhile, there was also a family of fat and happy rats that lived in the village. All day the rats sat in the cool house, the older rats taking naps and reading the newspaper, and the little rats running around playing. They enjoyed their easy life, especially during harvest season, because they could eat all the corn they wanted and take enough to store it for later where the humans wouldn't find it.

LARGE GROUP DISCUSSION

- Describe what happened in this role play/story.
- In this story, who is smarter, the humans or the rats?
- Who ruled in this community, the humans or the rats?
- What can we learn from this story?

The Bible says men and women are to rule over creation. God blessed them with creativity and the ability to think and reason because they were made in His image. God intends for humans to use the creativity He has given them to obey the principle of ruling over creation, not letting creation rule over them.

- How do the lessons in this story apply to our area?
- Give 1 or 2 examples of how your community has resolved a problem (like the rats) and come up with creative ways to 'rule over creation.'

SMALL GROUP DISCUSSION

- What are some other problems that you are facing in your community where it seems like creation is ruling over humans?
- What are some solutions to those problems? If you don't know of any solutions, then who could you ask for answers?

REPORT BACK

Caring for creation is not only using our physical strength; we also need to use our minds and creativity to work the garden, take care of it, and rule over it. When we rule (work and take care of creation) we are obeying God's commands to us and we are reflecting His image to others.

Application - 35 min

LARGE GROUP DISCUSSION

Facilitator: *Read the following story.*

In Uganda one pastor attended the TCT training. He was moved by the lesson in Module 3 about how we need to use wisely what God has given us. That evening he went home and prayed, "God is there anything that I have that I am not using wisely?" God reminded him that he had two acres of land that his father had left him that he had never planted. He wondered what to do.

One day he was at the market and saw lorries delivering papayas. God reminded him, "How many seeds are there in a papaya?" Many he thought. So, God prompted him to use the $1 that he had to buy two papayas. He took them home and planted the seeds in a nursery. When they were ready, he transferred the saplings to his fields. Within one year he had 300 papaya trees on his land, and the lorries that he saw at the market were now coming to his house! He became a wonderful role model to his community. He was able to pay his children's school fees and had helped others who were facing difficulties.

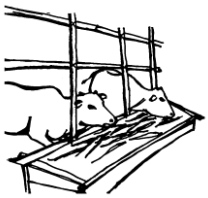
- What did the pastor do?
    - *Prayed.*
    - *Planted papayas in obedience to God's prompting.*
- How did the pastor become a better steward of what God had given him?
    - *He planted his land - he wanted to use the land God gave him wisely.*
- What was the result?
    - *He had enough not only for his own family but to help others as well.*

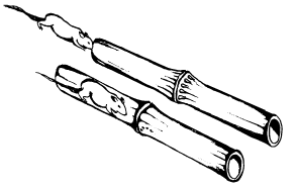
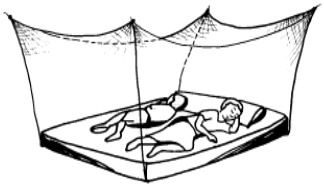
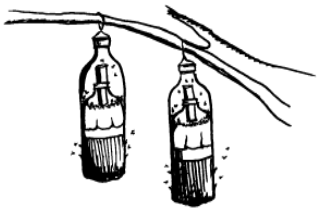
SMALL GROUP ACTIVITY (3-4 groups)
Facilitator: *Use* ***VISUAL AIDS: Creation Cards*** *(taken from Module 3).*

We did an activity in Module 3 that you may remember; we sorted cards into two piles depending on whether they show a right relationship with creation or not. In your groups, look at some of these cards again and do the following:

1. First make a pile of the things you currently do in your community. Then discuss what benefit you have seen because of doing these things.
2. Then, look at the rest of the cards of what you don't do. Why don't you do these things?
3. Discuss how each card could be a way to steward God's creation the way the Bible says to in Genesis.
4. Identify one or two other ways you can better steward God's creation.

Facilitator: *The italics in the chart below are just some ideas of how to be a good steward.*

Caring for Animals	**Clean Water**	**Farming**
		
We have been told to look after animals. We need to provide suitable pens for them, so they do not bring disease into our houses.	*Using filters, boiling water, or leaving it in the sun (SODIS) helps to make the water suitable for our bodies to drink so that it doesn't make us sick.*	*We need to farm the land God has given us. It should provide for our families, not control us. We need to set up irrigation methods and ways to make the soil more fertile so it will produce more.*

Picking Up Litter  	**Building A House** 	**Latrine** 
God asked us to care for our environment. This means we should keep it beautiful, so it honours God. We should not drop litter on the ground but put it in litter bins.	*We need shelter from the sun and rain. Ensuring that we have safe housing is part of ruling creation. We are no longer controlled by sun and rain.*	*Latrines reduce disease and keep our environment healthy. We need to take care of our environment and ensure that it doesn't cause us to get sick.*
Rat Traps 	**Digging a Well** 	**Sleeping Under a Mosquito Net** 
Rat traps can help us to reduce rats who eat our food. Rat traps do not need to be complicated. They can be made from bamboo like these. We need to rule creation and not let rats eat our food or make us sick.	*Wells are a way to access the water that God has provided under the ground. Well water helps us to stay clean and healthy.*	*Sleeping in a mosquito net is one way of ruling over mosquitos that carry diseases that can make us sick.*
Fly Trap 	**Growing Vegetables** 	**Not Cutting Down Too Many Trees** 
Fly traps are a way to reduce the number of flies. Flies can carry disease and contaminate our food. We are told to rule creation and reducing the number of flies is a way that we can do that.	*Growing nutritious vegetables is another way that we can develop creation and provide nutritious food for our family.*	*We need to be careful that, when we cut down trees, we always plant new ones. Trees are a gift from God that prevent landslides. If we cut down the trees and don't use the land it will quickly become wasteland. That is not taking care of creation.*

REPORT BACK

Facilitator: *Go over the questions above and help identify new ways of better stewarding God's creation.*

LARGE GROUP DISCUSSION
Everything belongs to the Lord. He owns it all. When He told Adam to work the garden and take care of it, He gave humans control over His creation.

Humans are not the owners, but we are the caretakers.

Stewardship in agriculture means transforming creation in such a way that it is being used as God intends and brings praise to the Creator. Instead of destroying the soil, a farmer should farm in a way that leaves it more fertile for future generations. Instead of using creation to satisfy human greed and desire for wealth, a farmer should protect and develop creation to be a blessing to others.

- Do you think people will take care of something that they own better than something that someone else owns or not?
- When I gave a person in our group a precious possession of mine, did you think the item was yours now? Did you look after it more carefully because it was mine? Why? Would you have looked after it with even greater care if it was the King/President's? Why?

Thank you for taking care of my personal treasure!

Being a caretaker of God's creation is a responsibility and a gift. What will you do with this gift?

Conclusion - 10 min

God has given humans the responsibility to rule over and steward creation.

- When we think of our community, what aspect of creation isn't being stewarded well?
- What could we do together to steward it better?

PARTNER DISCUSSION
With a partner, reflect on the areas of creation YOU have been given to steward (your land, house, well, animals, etc.). Choose one area that needs improvement and tell your partner what you will do to care for that area of creation this week. (Take turns sharing with each other one thing you will do better).

Pray quietly or together now, confessing any wrong ways or attitudes and asking God for wisdom to care for, develop, and rule over His creation.

Closing Prayer:

Thank you, Lord, that I don't have to be ruled by creation. I confess the times that I have allowed creation to rule me and my actions. I ask you for the wisdom to rule creation in the same way that You rule Your Kingdom. Father, help me to be a good steward of creation the way you have intended and to improve the land for my family and my community now and for future generations. I commit to steward Your creation, to honour You, and to use all that You gave me to develop it.

Lesson 3: The First Farmer

Main Ideas

1. Adam's first job was to be a farmer. Farming is a high calling from God.
2. Work is a part of God's original plan, and it gives us purpose and dignity.

Materials – none

The First Farmer - 15 min

In our first two lessons, we learned that God owns all of creation and He has called us to take care of ALL of His creation. In this lesson, we are going to focus on how God views farming and our work.

LARGE GROUP DISCUSSION

- How are farmers treated in your country?
- If people could pick what they want to do for work, would they pick being a farmer? Why or why not?

Read Genesis 2:8-9.

- What does this verse say God did?
    - *He planted a garden and made things grow out of the ground.*
- What do we call someone who plants a garden?
    - *A farmer.*
- If God was a farmer, what do you think this means about farmers?
    - *Farmers have value and purpose.*
- What did He plant in His garden?
    - *All kinds of trees.*
- What were the two purposes of the trees that He planted?
    - *To be beautiful (pleasing to the eye) and nutritious (good for food).*
- Is farming a valuable job? Why or why not?

From the verse in Genesis, we see that God was the first farmer! When God created the heavens and the earth, the sky and the sea and all the animals, He spoke, and they came into being. The Bible says that He 'planted' the garden and put Adam in it. He planted trees that were both pleasing to the eye (beautiful) and good for food (nutritious). Farming is an important part of the creation story - God was the first farmer!

PERSONAL REFLECTION

- How does this make you feel about being a farmer?
- How do you think God felt when He was farming?
- Do you feel the same way? Why or why not?

Adam's First Job - 10 min

LARGE GROUP DISCUSSION

Read Genesis 2:15.

After God finished creating everything, He gave Adam distinct roles and responsibilities. He gave him his first job.

- Why did God put Adam in the garden?
    - *To work it and take care of it.*
    - *To be the caretaker of the garden.*
- What does 'to take care of it' mean? What do we do when we take care of something?
    - *It means to protect it and nurture it so that it is healthy and productive.*
    - *It also means to value it and appreciate it.*
- What kind of daily activities would he do to work and take care of the garden?
- How did Adam know how to do these things?
    - *God must have given him the knowledge to do these things, or God must have taught him as he was going along.*
- What things can we do to take care of God's creation?
    - *Protect it from being damaged or destroyed – Keep it clean from litter or pollution by using toilets, not cutting down too many trees, dealing with pests, and not overworking the land.*
    - *Invest in it to make it better – Work the soil, provide irrigation, provide good nutrients for the soil.*

God planted the garden and then gave Adam the role to work the garden and take care of it. Adam's first job was being a farmer. This was an important job in God's creation. Notice that work was part of God's original plan for humans even before sin entered the world.

The Importance of Work - 35 min

LARGE GROUP DISCUSSION

- What is the common attitude about work in your community?
- Do people like to work? Why or why not?
- Who tends to do the most work?
- Why do people work?
- What would happen if Adam didn't take care of the garden and all the animals?
- What do you think would happen to your community if people stopped farming the land and taking care of the animals? What if there were no farmers?

SMALL GROUP DISCUSSION - **12 min**

Read the following verses and answer the questions:

Proverbs 14:23; Proverbs 12:11; 2 Thessalonians 3:10; 2 Timothy 2:6; Colossians 3:23-24

- What does the Bible say will happen if people don't work?
- What does the Bible say will happen if people do work?
- What else do we need to understand about work?
- How important do you think farming work is? Why is it important or not important?

REPORT BACK

Work was a part of God's original plan. In everything we do, we are called to do all our work with excellence to honour God. Our work has value, dignity, and purpose. The first responsibility God gave to Adam was to work and take care of God's creation—to be a farmer. So, farming work is a high calling from God. It fulfils God's command and therefore has dignity and purpose.

LARGE GROUP DISCUSSION

Facilitator: *Have the class respond to the two questions. Make this a fun activity to emphasise that this work is from God and brings us dignity. Work is for our own good.*

Make a list on the board of ALL of the things you LOVE about farming!
Make a list on the board of ALL of the things you LOVE about work!

Work was a part of God's original plan. In everything we do, we are called to do all our work with excellence to honour God. When we work the best we can, we feel good about ourselves. We feel productive and useful. If we do NOT work, or if we work poorly, we will feel worthless.

Conclusion **- 10 min**

We have discussed two very important topics today: farming and work! Let's review and reflect.

Farming: The first responsibility God gave to Adam was to work and take care of God's creation—to be a farmer like Him. So, farming work is a high calling from God. It fulfils God's command and therefore has dignity and purpose.
Work: Our work has value, dignity, and purpose. God, who made us, designed us to work because He knew it would give us value, dignity, and purpose!

1. Turn to your neighbour and tell them one thing you learned about farming and one thing you learned about work. *(Give them one or two minutes to share with their neighbour).*
2. As we close, take one more minute to share with your *neighbour* how you will now farm and how you will now work. *(give them one or two minutes to share with their neighbour).*

Closing Prayer: Heavenly Father, we know that You gave us this land to produce crops and fruit. We also know that You designed us to work. Thank You for these two wonderful blessings that give food to our bodies and value, dignity, and purpose to our souls. Lord, help us, as farmers, to do our best with the land and the work You have given us to honour you, so that we may also be a blessing to all others who are fed and nourished from the work we put into the land. Amen.

Lesson 4: God Heals the Land

Main Ideas

1. God will give us wisdom to farm our land when we ask, listen, and obey.
2. God's promise to heal our land means that there will be physical blessings as well as spiritual blessings when we obey Him.

Materials - none

Introduction - 8 min

In the previous lessons, we learned that God has made us the caretakers, or stewards, of creation. We also learned that God was the first farmer and God designed us to work. In this lesson, we will begin to focus on farming, and how we can do our best with our land.

LARGE GROUP DISCUSSION

- Have you ever prayed about your farm? For the land to produce or for wisdom to farm the land?
- Why or why not?
- What was the result?
- Do you think God cares about the way you farm?

God can provide wisdom about the way you farm. He gave the Israelites many specific instructions through Moses when He was preparing them to go to the promised land. In addition to the instructions, He also gave them promises if they obeyed Him.

God's Intervention - 12 min

LARGE GROUP DISCUSSION

Let's start by looking at two stories of how God has been involved in creation.

This is the story of George Washington Carver, who was a famous farmer, professor, and scientist.

George Washington Carver

George Washington Carver was born into slavery in 1864. He became an orphan when both of his parents died just a few years later. George loved to learn and rose to become a highly educated man and a professor at a university. At that time, in the area where Carver lived, everyone planted cotton on their farms. Carver taught the farmers to rotate their crops and occasionally plant peanuts instead. By doing this, the soil regained nutrients and the farmers reaped much greater cotton harvests. They were thrilled! But they didn't know what to do with the peanuts they were also harvesting. They could not sell them all and the peanuts were going to waste in their barns.

Carver set out to solve the problem. He took a handful of peanuts and prayed "Great Creator, why did you make the peanut? Why?" Carver loved God's creation and was fascinated by it. He began to examine every part of the peanut and experiment to see what could be done with it. Carver ended up inventing over 300 new products that could be made from peanuts! With so many possible products, the farmers were easily able to sell their peanuts. Carver's hard work, faith, and love of God's creation ended up saving the economy of the entire region.

- What did George Washington Carver do to help the farmers improve their cotton crops?

- What problem did the farmers have with the peanuts?
- What attitude did George Washington Carver have that helped the farmers solve this problem?
- Who gave George Washington Carver wisdom on how to address the peanut problem?

This is a true story that happened in one area that was in the TCT program around 2010.

The Miraculous Harvest

In one village in Asia, almost everyone was in debt. It was common practice to borrow money to survive during the dry season, and they often sold their crop even before harvesting in order to get money. The buyers paid less in advance than what the farmers would have received after harvest. This caused people to remain in debt year after year.

After receiving the TCT training on Biblical stewardship, several churches committed to do all they could to get out of debt. They made plans with the goal of being debt-free in five years.

That year, the country had a terrible drought. When the Christians went to their fields, they discovered that all of their tapioca (cassava) plants were withered and brown. They met together to discuss what to do. In the past, when the crops died, these farmers had taken huge loans to get them through the year. Yet, they had committed to the Lord to get out of debt. It seemed there was no hope of honouring that commitment now. At each of the churches, the farmers gathered to fast and pray, asking God what to do. They thought God told them to "wait", so they didn't take out any loans.

When it came time to harvest the crops, they decided to dig up the withered plants and see if anything had grown. As they dug up the plants, they were shocked to discover that each field had two or three times the normal amount of tapioca (cassava)!

Furthermore, because of the drought, the crops had all died in every area nearby, causing the price for tapioca (cassava) that year to more than double. With extra to sell and higher prices, the farmers in the areas where the churches had prayed earned four to six times their normal income. God had responded to their obedience with miraculous, abundant provision! As a result, they were all able to get out of debt in just one year instead of the five years that they had expected.

- How were the farmers being obedient to God?
- Did the farmers prepare the land differently or add special fertilisers?
- What did the farmers do differently this year to receive such a large harvest?
- Who made the crops grow?

God's Wisdom for Farming - 20 min

The Bible has guidelines for us as we farm.

SMALL GROUP DISCUSSION - **7 min**

Facilitator: *Assign each group one set of verses.*

Read the verses your group was assigned. List God's instructions in those verses, and the promises given to those who follow His instructions.

- Leviticus 26:1-6
- Deuteronomy 26:1-2; 10-11
- Deuteronomy 28:1-12
- Leviticus 25:1-7; 18-22

REPORT BACK

***Facilitator**: If you have a chalk board or large paper, draw this chart and fill it out as groups report back.*

VERSE	God's Instructions	Promises for Following God's Ways
Leviticus 26:1-6	*Do not make idols and place them in your land. Observe the Sabbath.*	*He will send rain; the ground will yield crops and trees, fruit. You will have enough to eat and have peace and safety.*
Deuteronomy 26:1-2,10-11, 18-19	*Give the first fruit of your crop to the Lord. Give thanks for all God has provided. Follow the commands of the Lord.*	*The Lord will bring honour, favour, and blessing to those who obey Him. They will be called a holy people, blessed above all the nations.*
Deuteronomy 28:1-12	*Obey the Lord your God.*	*Crops and livestock will be blessed; barns and work will be blessed; God will open the heavens, provide bounty, send rain, bless the work we do and honour us before nations.*
Leviticus 25:1-7; 18-22.	*Observe the Sabbath for the land—every seventh year, let it rest.*	*Live safely in the land and it will yield its fruit. There will be more than enough to eat. The sixth year will produce for three years.*

LARGE GROUP DISCUSSION

1. Are the blessings that God promises only for spiritual things or are they blessings for physical life as well? *Spiritual and physical.*
2. What is God's wisdom about farming that is in these passages?
    - *Rest for the land.*
    - *Tithe—giving back to God from the harvest.*
    - *Not worshipping idols.*
3. Why might rest be important for God's creation?
    - *It gives the land time to replenish and be renewed.*
4. What beliefs do people in your community have that recognize the power of other gods or ancestors over the land? *(Read Isaiah 8:19 if necessary).*
5. Which instructions would be the most difficult for you to follow and why?

God's wisdom about how to use our land is both specific and practical. Often, common farming practices have neglected some of God's wisdom. When we realise we have neglected His wisdom, we have the opportunity to change our ways. Even when people sin against God, He is loving and merciful when His people repent and call on His name.

Prayer for Help and Healing - 25 min

LARGE GROUP DISCUSSION

***Facilitator:** Ask each person to think about these questions. As a group, make a list of their problems and concerns so that they can see them to pray about them later.*

- What problems or challenges do you have with your land now?
- What concerns do you have about your crops or animals?

The Bible reminds us that God, who created all things and owns all things, is able to help us. When we seek Him and listen to Him, He will answer us.

We have talked about 2 Chronicles 7:14 in other modules. *(Reread 2 Chronicles 7:14).*

- Who does God call on to humble themselves and pray?

    - *Not all people, but all **His** people—which today are the Christians.*
- What did God say would happen if they were obedient?
    - *God will heal their land*.
- What would it look like if God healed your land? Do you have any examples of how He has done that already in your community?

James 1:5 tells us that "If any of you lacks wisdom, you should ask God, who gives generously to all without finding fault, and it will be given to you."

- What sort of wisdom do you need to be a good farmer?
    - *When to plant, types of crops, when to sell.*
- Do you think God can give wisdom for these types of issues?

Read Proverbs 2:1-6.
What three things does this passage teach us to do to receive wisdom from the Lord?

1. *Accept God's words and keep His commands.*
2. *Call out or cry out for understanding from God.*
3. *Look for and search for God's wisdom.*

This is still true today. God will provide wisdom if we ask Him. He will heal our land if we humble ourselves and turn from our evil ways. He will make His name known by His goodness to us.

SMALL GROUP ACTIVITY
Think back to the problems that you have been facing with your land, your crops, or your animals. Take time to specifically pray together about those problems and ask for wisdom.

REPORT BACK

Facilitator: *If the group has low literacy levels you will need to reread the list to the group. After groups have prayed, ask for them to share any new ideas that God has shown them through their time of prayer.*

Conclusion **- 10 min**

Facilitator: *Give time for many testimonies or even ask each person to share one area for change.*

In closing, we want to hear testimonies in which area you feel God is calling you to make a change. What change will you make on your farm/land this week?

Now, let's close with a corporate prayer of thanksgiving!

Lesson 5: Caring For Our Soil

Main Idea

1. We feed the soil so that micro-organisms feed the plants.
2. There are three ways to care for our soil: minimal soil tillage, keeping soil covered, and crop diversification.

Materials

1. Visual Aids:
    a. What is Soil?
    b. Dibble Sticks
    c. Narrow Slots or Strips using a Ripper
    d. Small Planting Holes or Pits
    e. Common Green Manure Cover Crops

Introduction - 5 min

LARGE GROUP DISCUSSION

Have you ever been to a forest? What is the soil like in a forest? It's nearly always very fertile. That's because the land in a forest follows God's system and not ours.

As we know well, God created the earth and everything in it. When we look closely at His creation, we see an amazing design—everything works together perfectly. In the forest, trees drop leaves, these leaves breakdown and feed the soil, the soil feeds the trees and helps them to be healthy. Or look at something as simple as breathing—we breathe in oxygen *(take a deep breath in)* and we exhale out carbon dioxide *(breathe out).* But plants do the opposite. They breathe in carbon dioxide and out oxygen. Plants make what we need, and we make what plants need. It's amazing. It's just one example of God's perfect design.

- Can you think of other examples of God's design in creation that work together like this?

We see many examples in farming. For example, trees drop **leaves**, these leaves breakdown and feed the soil, the soil feeds the tree and helps it to be healthy. This is also true with **animals**. The animals eat the plants and then produce manure or waste, the manure also feeds the soil that then helps the plants grow. Some of the animals that do this are so small you can't see them with your eyes. They are called **microorganisms**. They live off the decaying things in the soil and their waste provides nutrients that plants need. The **sun** even helps plants use the carbon dioxide and water to make food for the plants. Then as plants grow, they feed people and animals. God designed creation to help each other, to bring life to each other.

What makes good healthy soil? - 15 min

SMALL GROUP DISCUSSION

In this lesson we are going to learn more about soil and how to care for it. The health of our soil is essential to the health of our plants.

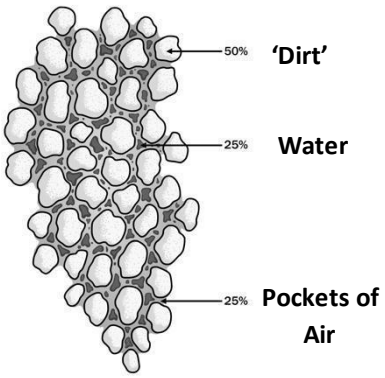
- What does healthy soil look like, smell like and feel like? How do you recognize good, healthy soil?
- What words would you use to describe bad soil?
- What techniques do you know of to make good, productive soil?
- Have you tried any of them? What was the result?

REPORT BACK

We have all seen both healthy soil and bad soil. It is hard to grow crops and produce a good harvest in bad soil, but healthy soil easily grows good crops.

Good Soil is made up of three things: *(Show **VISUAL AIDS: What is Soil?**)*

- 'Dirt' – which is a mixture of sand and decaying plants and animals (organic matter)
- Air – this allows for oxygen to be delivered to plant roots and to microorganisms in the soil
- Water with nutrients in it is essential for plant growth.



If we could look very closely at our soil, we would find that it is a mixture of some sand, some bits of decaying things, some water and some air.

Healthy soil is full of life. In God's system, there are three things that bring life to our soil:

1. Micro-organisms – are living things so small that they can only be seen with special equipment. Many microorganisms live in the soil.
2. Organic matter – is anything that was once alive—like leaves and insects—that breaks down and decays over time. Organic matter provides food and protection for the microorganisms and plants.
3. Minerals and Nutrients – are found in clean water and give life to the microorganisms and plants in the soil.

When microorganisms, decaying plants and minerals work together to add nutrients into the soil, we say the soil is rich and fertile.

Feeding the Soil - 5 min

LARGE GROUP DISCUSSION

Plants need good, healthy soil, just like we need healthy foods to feed our bodies.

- What nutrients do plants need that you already know about?
- What nutrients do you use to feed your plants? When do you use them?

  Most farmers know about three nutrients (nitrogen (N), phosphorus (P) and potassium (K)) that are good for plants, but plants actually need many different nutrients at different points of their growth and production.

- What would happen to our bodies if we only ate potatoes, rice, and cassava?
  - *Our bodies don't get enough nutrients and we become malnourished.*
- What do you think will happen if we only use three nutrients (NPK) to feed our plants?
  - *Just like our bodies, the plants will not get enough nutrients, so they won't produce as well as they could.*

Fortunately, we don't have to be experts to know how to feed our plants all of the nutrients that they need. God created a natural cycle between plants, animals, worms, micro-organisms, organic matter, air, and water that makes the soil healthy and give plants all the nutrients they need. The living organisms in the dirt work together to improve the health of our soil. In other words, God's plan cares for His creation. But we can help or harm His plan.

Later we will learn to make earthworm food baskets that will feed the soil. If we feed the soil good organic matter, then the soil will feed the plant.

Now we're going to look at one farming practice that harms God's good design for creation and three practices that help the natural cycle God put in place.

The Problem of Chemical Fertilisers - 5 min

A common way to feed soil can be chemical fertilisers.

- Has anyone used chemical fertilisers? If so, what have you used?
- What was the result? How about long term? Did you need to use more and more with each year?

The problem with chemical fertilisers is that they interrupt the design that God has put into place. Chemical fertilisers kill the healthy microorganisms that live in the soil. As a result, each year you need to use more and more chemicals to get the same result. The other problem with chemicals is that they are washed into rivers, streams, or the groundwater, where they contaminate drinking water and damage life in the streams. Using chemicals can be harmful for the farmer as it comes in contact with their bodies.

So, there are four reasons why chemical fertilisers are bad:

1. They destroy God's natural cycle in our soil.
2. We need to buy more and more each year.
3. They pollute our water, so that our drinking water is not safe and fish die off.
4. They are dangerous to our health if we touch chemicals.

There are ways to have healthy soil without using chemical fertilisers. Let's look at three key methods.

Minimal Soil Disturbance - 25 min

SMALL GROUP ACTIVITY

The first technique that we are going to look at is called 'minimal soil disturbance.' Soil disturbance is when a person, animal, or machine is used to dig into the soil, turning it over and exposing the underneath soil to the sun. This is called ploughing or tilling the soil.

Listen to this story and then in your groups, identify the four negative effects of excessive soil ploughing.

> James's family had been farming their land for three generations before him. His great grandfather had cleared the land and taught his grandfather and father to plough and plant the land. But even though they used those same methods, the crops seemed to be less and less each year.
>
> James heard that there was going to be a training next Saturday for improving their soil and getting so many more crops each year. James told his father about the training, and they decided to go together.
>
> At the training, the teacher held up a poster that showed a plough with a big X over it. He explained that when we dig into the soil, turning it over every year, we are actually harming the organic matter in the soil and we are disturbing God's natural blanket to protect and build good soil. James had never heard that—he and his father had ploughed their land every year and sometimes more than once a year. He was interested in this new idea.
>
> But his father was not! He crossed his arms and argued with the teacher, "On our land, we *must* plough. Otherwise the ground is too hard and tough to grow anything good."
>
> The teacher said he understood that many farmers felt this way. Then he explained, "We do not want our soil to be tough and hard. To grow good crops, we need organic matter, air, and water mixed with the soil. But the best way to get those things into the soil—the way God designed—is for worms and insects to live in the soil. When we plough the land, we expose the beneficial worms and insects to the sun and

they die. There's something else living in the soil and nourishing it," He said, "something too small to see—microorganisms. These also die when they are exposed to air and sunlight."

The teacher also shared that ploughing leads to erosion—where the top layer of soil is lost—which makes land that used to be fertile become unproductive. He said, "And one more thing. Organic matter is like food for the soil. When we plough and expose organic matter to the sun, it gets burned. The soil doesn't like burned food any better than you and I do!" Everyone laughed at that…everyone except James' father.

When they went home for supper that evening, James's mother asked how the training had gone. "Terrible!" James's father exclaimed. "The teacher doesn't understand how we live here or what our soil is like. He says ploughing is bad for the soil. But my grandfather always ploughed, and he had the richest harvests!"

"But father," James argued, "Maybe all these years of ploughing have caused erosion on our land, just as the teacher said. Maybe that's why our harvest seems to shrink each year no matter what we do." James's father didn't respond, and they finished their meal in silence.

James barely managed to convince his father to go back for the second day of training. But after reminding him of how their crops had been so poor the last few seasons, he said, "Maybe the teacher will give us some good ideas to improve our harvests." Reluctantly, his father agreed to return.

The teacher spent the morning teaching many techniques for planting crops and nourishing them without ploughing or disturbing the soil. By the end of the day, James was excited to put into practice what they had learnt—to stop ploughing and instead use new methods to plant, restore, and protect the soil. But he was worried that his father still wouldn't agree to it. As they walked home together, he prayed for the right words to convince his father. But before he could even speak, his father said, "Son, after thinking it over, I've decided we should try the methods this man taught us. My grandfather was himself trying something new when he came to this land and planted it for the first time. I think he would advise us to try something new to help our land grow well."

James only said, 'Yes father, I agree.' But in his heart, he sang praises the rest of the way home—for these new ideas and for his father's change of heart.

In your groups, discuss:

- What are the negative effects of excessive soil ploughing that James learnt?

REPORT BACK

Let's find out what you learnt! What are some negative effects of excessive soil disturbance?

Facilitator: *Reinforce each of these points below and make sure they are clear before going on.*

1. *Worms, insects, and microorganisms are destroyed. As they are turned up and exposed, the sunlight kills them.*
2. *Organic matter is harmed. The sun burns off nutrients in any organic matter that is brought up to the surface during ploughing.*
3. *Erosion makes land less productive. Ploughing causes soil to break down and becomes smaller, resulting in loss of topsoil and erosion from rain and wind.*
4. *Nutrients are depleted and the soil is not healthy.*

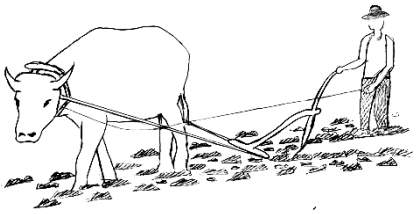
LARGE GROUP DISCUSSION

So what should we do? We want to move the soil as little as possible. Think about the forest, does God ever plough the land? No. But even though God doesn't plough the land it still grows well.

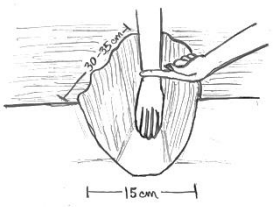
When we are planting crops the first time a plot of ground is prepared, some form of ploughing and clearing of weeds may be needed to prepare the land. After that, it is best not to use any kind of machine or ox to plough a whole plot of land. The following techniques can be used to avoid further disturbance of the soil during seeding.

- Use a Dibble Stick or Direct Planting Machine to make small holes in the ground so that seeds, seedlings, or small bulbs can be planted. *(Show **VISUAL AIDS: Dibble Sticks**).* A Dibble Stick is simply any stick (or even a machete) strong enough to create holes in an un-ploughed field with stubble/crop residue. One common method is to cut a hardwood stick from the bush and sharpen one end. Lines can be carved into the stick to show different depths need for planting different seeds. Then use the Dibble Stick to make holes in straight lines at evenly spaced intervals (this will make it easier to weed and apply fertiliser or manure later on).

- Create Narrow Slots or Strips using a Ripper. A ripper is a chisel-shaped tool pulled by smaller animals or a tractor. It opens a narrow slot in the soil, about 5–10 cm deep where seeds are placed without disturbing all of the soil around it. The ripper is smaller and lighter than a plough. It is also easier to operate and cheaper to buy and maintain. *(Show **VISUAL AIDS: Narrow Slots**)*



- Create small planting holes or pits using a handheld hoe. The pits are between 15-25 cm deep and 30 cm across with about one metre between the rows (this will depend on the ease of digging and the depth of the soil). After planting the seed, bulb, or seedling, the topsoil is returned, together with manure, mounding it up around the hole to catch rainfall and keep it where the plants are growing. *(Show **VISUAL AIDS: Planting Holes or Pits**)*



Discuss:

- Has anyone here used any of these three methods? How did you plant seeds?
  - What have been the benefits?
  - What are the challenges?
  - Would you recommend it? Would you be willing to teach others?

Keeping Soil Covered - 5 min

If you have been to the forest, you have seen that the forest floor is covered in old leaves and branches. That is God's natural blanket over the soil. Keeping soil covered is another way to help improve your soil.

There are three reasons why keeping soil covered is important. Listen and see if you can remember them.

> Covering your soil with organic matter helps **maintain temperatures** (so it doesn't get too hot), helps **maintain soil moisture** (so it doesn't dry out and die), and the organic matter feeds the insects and living organisms which **increases the soils nutrients**.

SMALL GROUP ACTIVITY (3-5 people)

In your groups, see if you can create hand motions, a song, a rhyme, or a roleplay to help the rest of the group remember the three benefits of keeping the soil covered.

1. *maintains proper temperature*
2. *maintains soil moisture*
3. *increases the soils nutrients*

REPORT BACK

Facilitator: *Ask each group to demonstrate what they created to remember the three reasons. Then reinforce <u>why</u> each of these points are important to having healthy soil.*

- **Maintains proper temperature** – this allows microorganisms and nutrients to thrive and not die from heat.
- **Maintains soil moisture** – soil exposed to the sun dries out VERY fast. Soil that has a cover will stay moist a long time, which allows microorganisms to grow and nutrients to flourish.
- **Increases soil nutrients** – When micro-organisms stay alive and the ground cover decays, more nutrients are in the soil to feed the plants.

LARGE GROUP DISCUSSION

There are two easy ways we can cover soil:

1. **MULCH:** Mulch is a layer of material, like leaves, stalks, bark, wood chips, or grass, used to cover the soil. When we harvest our crops, we can leave every part of the plant we don't eat as a protective covering for the soil.
2. **COVER CROPS:** Cover crops (or Green Manure Cover Crops) are usually legumes that are planted in between the main crop or alternate cropping seasons. Well-known legumes include alfalfa, clover, beans, peas, chickpeas, lentils, lupins, mesquite, carob, soybeans, peanuts, and tamarind. While they are growing, legumes give nitrogen to the soil, cover the soil, and keep weeds from taking over. When the plants are slashed or die, they can be left on the ground as mulch.

- Has anyone here used mulch or Green Manure Cover Crops GMCCs? What did you use and how?
    - What have been the benefits?
    - What are the challenges?
    - Would you recommend it? Would you be willing to teach others?

Facilitator: *Show **VISUAL AID: Green Manure Cover Crops (GMCCs) with Planting Instructions**. Read the list of common GMCCs. Ask the questions below. If anyone would like to try to plant a GMCC, give them the planting information from the chart (or invite them to come up after the class to write it down)*

- Which are common in your area?
- Are there any which you would like to try?

Crop Diversification - 5 min

This is the last method of soil care. Again, think about a forest. Have you noticed there are lots of different plants growing together, not just one plant? Each plant uses up different nutrients and puts different nutrients into the soil. God created a variety of plants and trees to keep this wonderful balance.

Remember the story of George Washington Carver? He was concerned because everyone was growing cotton, which took all the nitrogen out of the soil. He wanted them to plant peanuts because they add nitrogen to the soil.

Farming only one crop year after year is bad for the soil because it destroys the natural balance that God intended.

Crop diversification (farming two to four different crops) follows God's good design by putting different nutrients in the soil. Crop Diversification can be done by either intercropping or crop rotation.

1. **Intercropping** is planting two or more types of crops side-by-side or in-between rows. Maize and legumes are good for intercropping, because maize takes nitrogen from the soil and legumes give nitrogen to the soil.
2. **Crop rotation** means changing the crops you grow in the same area. For instance, you might grow maize one planting season and corn the next. Because crop rotation helps restore God's natural balance to the soil, it also reduces erosion, makes the soil more fertile and increases crop yield.

LARGE GROUP DISCUSSION

- Has anyone here used Crop Diversification? What did you use and how?
  - What have been the benefits?
  - What are the challenges?
  - Would you recommend it, and would you be willing to teach others?

Conclusion **- 5 min**

God created a natural cycle in the soil that makes the soil healthy so it can give plants all they need. We can participate in God's good design for our land! We can cover the soil with mulch, practice minimal soil disturbance and crop diversification, and use homemade fertiliser that is better for the soil than chemicals.

Take time now to think about how God cares for the land and how well forests grow in His soil. What could you do to steward His land better? What new methods will you try?

Lesson 6: Nutrients for Growing Plants

Main Ideas

1. Nutrients are passed from the soil to plants to animals and humans and back to the soil again.
2. Like humans, plants need the right kinds of food (nutrients) at the right time (stage) of their growth and development.

Materials

1. Visual Aids:
    a. Nutrient Cycle
    b. Nutrients by Stage Chart (one for each small group)
    c. Nutrients & Stages Cards (one set for each group, cut into cards)
    d. Adding Nutrients Cards (one set per group, cut into cards)
    e. Organic Materials for Each Stage of Growth - Print one copy
    f. Making Your Own Fertilizer

Introduction - 2 min

LARGE GROUP DISCUSSION

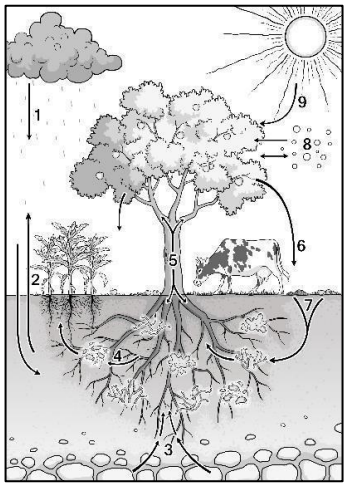
In the last lesson we said that just like it is important for our bodies to get enough nutrients to be healthy, it is also important for plants to get the right nutrients to be healthy.

To take good care of the land God has given to use, we need to learn more about God's wonderful system. Then we can help our crops get enough of the right nutrition at the right time.

The Nutrient Cycle - 5 min

LARGE GROUP DISCUSSION

Facilitator: *Show the* ***VISUAL AIDS*** ***poster: Nutrient Cycle****.*



We have already talked a little bit about how nutrients are added to the soil. Now we will look closer at the full nutrient cycle.

The nutrient cycle is the way nutrients are created and passed to give life to all of creation. Nutrients are essential for life.

Nutrients in the soil are used by plants, which are eaten by humans or animals, and then returned to the environment when they die or when they eliminate their waste (e.g. plants lose their leaves, animals' manure).

Worms, insects, and micro-organisms in the soil break the organic matter down, and again make nutrients available in a mineral form, which makes it possible for plants to use them again. This is the nutrient cycle.

Another aspect of this cycle is that organic matter not only contributes to soil health, but healthy soils contribute to the production of better organic matter.

One of the best ways to add organic matter to the soil is to maintain healthy soil and grow healthy crops that add large amounts of plant decay. Healthy soil produces healthy plants that make livestock healthy, which eliminates waste that produces many good nutrients making the rich, fertile soil.

Discuss:

- Name the different things in this picture that will contribute to making healthy soil.
    - *Water (rain)*
    - *Manure*
    - *Leaves and decaying harvest crop*
    - *Sun*
    - *Micro-organisms*
- What do you think the arrows show us?
    - *There are different ways for nutrients to go into the soil and then to come back into the plants and trees.*

Let's quickly review the 9 different parts of this cycle.

1. **Rain** – delivers nutrients that were absorbed into the atmosphere to the plants and soil.
2. **Soil** – water, air, and nutrients are stored here until they are needed by the micro-organisms or plants. Some nutrients are returned to the air through evaporation.
3. **Rocks, stones, and pebbles** – strong plant roots will also help break up the minerals in rocks into smaller pieces for other organisms to use in the soil.
4. **Micro-organisms** – eat organic matter and deposit nutrients in the soil in their waste.
5. **Trees and plants** – absorb nutrients in the soil through their roots and deliver them to other parts of the plants. The roots help create tunnels in the soil where oxygen and water can be delivered to micro-organisms. They also use energy from the sun to convert other nutrients into their food.
6. **Dead leaves and old crops from plants and trees** – they've lived their cycle and now they are recycled into the soil to be used as 'food for the soil' as they break down.
7. **Animals** (above ground and below ground) – have many functions. Worms dig in the soil making tunnels for air and oxygen. Microorganisms help dead plants to decompose. Cows and Oxen eat grass and weeds. Chickens and other birds eat harmful bugs. All animals' waste is also 'food for the soil'. Along with decaying plant material, animal waste feeds the soil as it breaks down.
8. **Air** – holds the floating nutrients that plants and animals need such as hydrogen, carbon, and oxygen. Fresh leaves on plants receive nutrients from rain and air, absorb those nutrients into food to deliver to other parts of the plant.
9. **Sun** – the sun radiates energy to plant leaves so they can absorb their food.

Growth Stages **- 45 min**

LARGE GROUP DISCUSSION

- What do you feed your baby when he/she is 3 days old? 6 months?
- What changes do you make in feeding your child at 2 years? 10 years?
- Why do you feed your baby differently as the baby gets older?

Feeding plants requires a similar approach of using the right amount of the right material at the right stage. This will allow the crops and/or livestock to reach their optimum growth in a healthy, natural way.

Many people think that the more nutrients in the soil, the better the crops grow. But this isn't true. If you could eat twice as much, would you grow much taller? No? What do you think would happen?" Over-fertilizing, like overeating, is not good.

Like humans, plants and animals need different kinds of food (nutrients) at different stages of their development. Just as a new-born baby needs breast milk, young plants or animals can only be fed with nutrients and quantities that are appropriate for their age.

All crops go through the stages of growth and development according to the changes that occur with flowering and fruiting. They grow best when we give the soil the right amount of the correct nutrients at the correct time.

Facilitator: *Show* ***VISUAL AID****:* ***Nutrients by Stage Chart****. Explain each column (growth stage) as written below. Then go through each row starting with Nitrogen. (e.g., In the Growing stage "High" amounts of Nitrogen are important in this stage. In both the Change Over and Ripening Stages low amounts of Nitrogen are needed for plant.) Go through each row, showing how much the nutrient is used at each stage.*

Three Growth Stages of a plant nutritional need

1. **Growing Stage** (infant) – This is the stage when plants develop their roots, shoots, and leaves. This is when plants grow the most and need high amounts of Nitrogen.
2. **Change Over Stage** (adolescent) – This is the stage in which the plants begin flowering in preparation for reproduction. This stage is similar to the adolescent stage for youth. During this time, boys and girls need more food to help their bodies make the changes to adult bodies. Plants also have a similar phase in which they need different nutrients than before. Plants need high amounts of Calcium (Ca) and Phosphorus at this time.
3. **Ripening Stage** (adult) – This is the stage from flowering to ripening of the fruits. For proper colour development of fruits, Potassium (K) is needed.

NUTRIENTS	**GROWING**	**CHANGE OVER**	**RIPENING**
Nitrogen (N)	**High**	Low	Low
Potassium (K)	Low	Medium	**Medium-High**
Phosphorous (P)	Low	**High**	Medium
Calcium (Ca)	Low	**High**	Medium

SMALL GROUP ACTIVITY

Facilitator: *Give each group an envelope with a full set of* ***VISUAL AIDS****:* ***Nutrient & Stages cards****, and the* ***VISUAL AID****:* ***Nutrients by Stage Chart****. Each group should sort the cards into three piles representing each of the three stages. If you do not have copies of the cards available, you can play a game by dividing into small groups and reading a card aloud and see which group identifies the stage that the card fits into.*

Visual Aid: Nutrient & Stages cards

When plants develop their roots and shoots	Plants begin flowering at this point.	The fruit begins to ripen on the plants
Infant plants	Adolescent plants	Adult plants
Requires a high amount of Nitrogen to stimulate growth	Plants need Phosphorus and Calcium	Plants need a high amount of Potassium for colour development and some Phosphorus and Calcium.
Requires a low amount of Potassium, Phosphorus and Calcium	Plants need some Potassium and very little Nitrogen	A very low amount of Nitrogen is needed

Growing Stage	Cross-Over Stage	Ripening Stage

LARGE GROUP DISCUSSION

- Which nutrient is most needed for the growing stage of plants? *nitrogen*
- How can you tell a plant is in the growing and developing stage? *Small plant but growing roots and leaves.*
- Which nutrient is most needed for the flowering and ripening of fruit? *Potassium*
- How can you tell a plant is in this ripening stage? *The fruit begins to ripen*
- Which nutrients are most needed during the transition (change over) to flowering? *phosphorus and calcium*
- How can you tell a plant is in the change-over stage? *The plant begins to flower.*
- What crops are growing in your fields right now?
- Which growth stage are they in? How can you tell?
- What nutrients would be helpful for them now?

REPORT BACK

Reinforce:

- Nitrogen is needed especially in the Growing Stage
- Potassium is needed especially in the Ripening Stages
- Phosphorus is needed especially in the Change-Over Stage and some in the Ripening Stage
- Calcium is needed especially in the Change-Over Stage and some in the Ripening Stage

We have talked about **when** to add these four important nutrients, but now we need to know **where to get these nutrients** and **how to add them**.

In the last lesson, we talked about why chemical fertilizers are bad. In this lesson we will talk about how to create our own organic fertiliser and some other ways to add nutrients through organic materials like banana peels, eggshells, coffee grounds, and seaweed.

Now, let's see if we can figure out what we can put in our soil to add these important nutrients at the right time.

SMALL GROUP ACTIVITY (3 groups) - 5 min

Facilitator: *Give each group one envelope set of* ***VISUAL AID: Adding Nutrients cards****. Assign each group one stage to focus on for this activity. They will look at each card, discuss, and sort the cards into two piles – one of the nutrients that are needed for that stage (medium and high) and one of the nutrients that aren't needed in that stage (low) You may need to demonstrate using one or two cards to get the groups started. Use the Growth Stages & Nutrients Chart to help them remember each stage.*

In your groups:

1. Look at each card to see what it is and what nutrients it provides.
2. Decide if you would want to add it to your organic fertiliser? (medium and high)
3. Then make a pile of all the things that could be used in that stage to give the right nutrients to the soil and plant.

REPORT BACK

Facilitator: *After each group has made their piles, ask one group at a time to share what organic materials they would add to their fertiliser for that stage of growth. Ask the large group, if they agree or make changes as needed. Finally, show the* ***VISUAL AID: Organic Materials for Each Stage of Growth****)*

- **Growing Stage** – Nitrogen (peas, beans, composted cow & chicken manure, coffee grounds and other GMCCs)
- **Change-Over Stage** – Phosphorus (banana peels, crab shells, shrimp peelings, grains and nuts) and Calcium (eggshells, fireplace wood ash) and some Potassium (banana peels, fireplace wood ash, kelp and seaweed)
- **Ripening Stage** – Potassium (banana peels, fireplace wood ash, kelp, and seaweed) and some Phosphorus (banana peels, crab shells, shrimp peelings, grains and nuts) and some Calcium (eggshells, fireplace wood ash) Change-Over Stage and some in the Ripening Stage

Create Your Own Fertiliser - 5 min

Now that we have learned what plants need in the different stages of growth, we can learn how to make our own organic fertiliser that is good for the soil and helps provide the nutrients that are needed. *(Give handout **VISUAL AID: Making Your Own Fertiliser**)*

To make your own natural fertiliser, you can use organic matter like maize husks, dead leaves, manure from small animals, wood ash, water, and urine.

You will need the following:

- 20 kg of maize husks.
- 20 kg of manure from small animals like goats, pigs, chickens, or rabbits. Do not use cow or horse manure (poultry manure has higher nitrogen and lower potassium than other manure).
- 10 kg of wood ash.
- 5 l of water or urine. The urine can be human or animal urine.
- You also need a large plastic bag, a sack to store the fertiliser, and a clean floor.

Procedure: Pour the 20 kg animal manure on the floor. Add the 20 kg maize husks or dead leaves. Mix them well. Then add 10 kg wood ash and mix again. Make sure all components are well mixed.** Next, add 5 litres of urine or water. Mix them well and put the mixture in your plastic bag; put the bag inside the sack and tie it tightly so that no air can get in or out. Keep it in a covered area for 21 days. After 21 days, open the sack. **Caution**: When opening, don't look into the sack. The smell and the air that comes out is very strong. Dry the fertiliser in the shade for 2 hours and then put it back into the sack for storage or use it right away.

** If you do not use chemical fertiliser now, we do not recommend starting. But some people already have a lot of chemical fertiliser. If you have been using chemical fertilisers, you can add a small amount to your organic fertiliser after mixing in the wood ash. Make sure you understand how to use it wisely. You can add 5 kg of CAN fertiliser or add 5 kg of Urea Chemical Fertiliser. Mix in the fertiliser very well. Then add the urine and proceed as indicated above.

When you first use your organic fertiliser, test it on a small section of your crop before using it on all your crops. A small amount of fertiliser and organic matter can make a big difference. Remember, we are feeding the soil so that the micro-organisms can provide the nutrients that plants need.

Organic Materials to Add to Your Fertilizer: Now we can also apply what we just learned about organic materials that are needed in each stage of plant growth. You can add them to your organic fertilisers or put them in your Earthworm Food Baskets during each stage to keep feeding your soil and the micro-organisms in it. These organic materials break down slowly so they will not harm your soil.

- Banana peels – The best way to use them is to cut them into small pieces. Cut up one or two peels to add to the mix. This will give your vegetables a good source of potassium.

- Coffee grounds – Acid-loving plants such as tomatoes and flowers need extra amounts of nitrogen to help them grow. Coffee grounds are a good source of nitrogen. Instead of adding the grounds to the fertiliser, you can sprinkle coffee grounds on top of the soil before watering. Another option is to make a liquid mixture: soak 6 cups of coffee grounds in a 5-gallon bucket of water. Let it sit for 2-3 days and then saturate the soil around your plants.
- Eggshells – Wash them first, then crush. Work the shell pieces into the soil near tomatoes and peppers. Eggshells have calcium, which helps fend off blossom end rot.
- Peas and beans and other GMCCs – it is best to mash them up and add them to the soil.
- Seaweed – Both fresh and dried seaweed are very good for soil. You do not need to remove the salt on it. Chop up a small bucket of seaweed and add it to 5 gallons of water. Let it sit for 2-3 weeks loosely covered. Use it to drench the soil and foliage. 2 cups work well for a small plant, 4 cups for a medium plant and 6 cups for a large plant.

Understanding Fertilisers - 5 min

If you have ever used chemical fertilisers, you may know that they include some mix of Nitrogen, Phosphorus and Potassium (but not Calcium). Before you use any kind of fertiliser, you should make sure you ask how to use it. Fertilisers are NOT all the same.

- All-purpose chemical fertilisers will often have equal parts of Nitrogen (N), Phosphorus (P) and Potassium (K) and may be labelled 10-10-10. This represents the amount of N, P, K. and they are always listed in that order.
- A good mix for the growth stage would be 10-5-5 – high Nitrogen and low Phosphorus and Potassium.
- A good mix for the change-over stage would be 5-10-8 – with low Nitrogen, high Phosphorus and medium Potassium.
- A good mix for fruiting would be 5-7-9 – with low Nitrogen, medium Phosphorus and medium-high Potassium.

We already talked about the harm caused by chemical fertiliser. Now we can see two other dangers of chemical fertilisers:

1) If you use a mix of chemical fertiliser at the wrong time, it could harm the growth of your crops.
2) Chemical fertilisers are concentrated and too much can kill your plants and destroy your soil.

It is best to use God's methods to feed your soil and plant with natural organic materials and organic fertilizer. And it is important to understand the nutrients that are needed in each stage of growth so you can care for your land like God commanded.

Conclusion - 10 min

SMALL GROUP DISCUSSION

Think about your crops this past season:

- Did you fertilise your crops? When did you fertilise them? How did they respond?
- How would knowing about these three stages benefit your farming?
- What is one thing that you learnt that you want to use in your farming practices?

REPORT BACK

Lesson 7: All-Year Food Gardens

Main Ideas

1. A well-planned garden will provide more than enough healthy food for your family all year long, so you can make extra income and also share with neighbours and those in need.

Materials

1. Visual Aids:
    a. All-Year Food Garden (one copy)
    b. Ten Steps to Make an All-Year Food Garden (1 copy or make a poster)
    c. Steps for Making All-Year Food Gardens Picture posters (1 set of eight pictures)
2. Materials to make Earthworm Food baskets – plot of land, shovel, sticks, and natural materials for a garden bed frame (coconut branches or bamboo, for example), sticks about 30 cm long, weaving material for the basket (like bamboo or local soft material that is natural but not easily degradable).

Introduction – 5 - 8 min

LARGE GROUP DISCUSSION

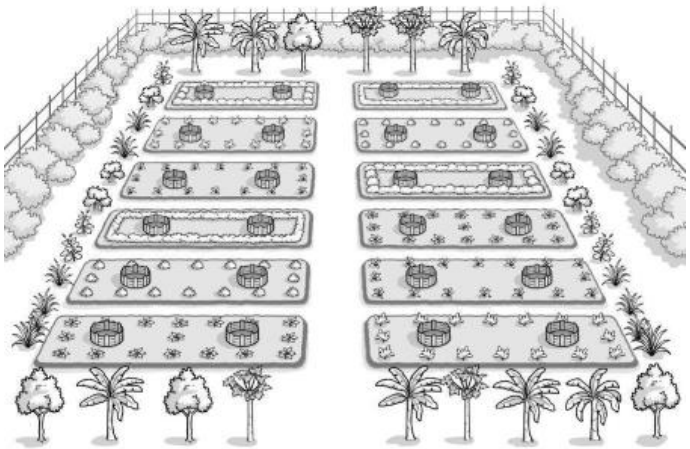
We have learnt a lot about cooperating with God's natural design in our farming. In this lesson we will apply some of the same ideas to our gardens.

- What kinds of vegetables do you eat in your home regularly?
- Why do you think it's important to eat fruit and vegetables?
- Do you grow fruits and vegetables for your family to eat on your land now? If so, what kinds?
- What do you do when the weather is too hot or too cold to grow food in a garden outside?

Making an All-Year Garden - 40 min

While farms typically have only one, two, or three crops, which may be harvested just once or twice a year, an All-Year Food Garden is designed to provide lots of different vegetables and fruits all year long. In very hot or very cold weather hoop houses or shades can be used to keep your garden growing food all year long. We will see how to make a Hoop House in a later lesson. The garden design we're going to learn about uses only 100 square metres of land. This is what this type of garden could look like:

Facilitator: *Show the* ***VISUAL AIDS*** *picture of the full* ***All-Year Food Garden****.*



This kind of garden uses early maturing, semi-annual and annual vegetables, so that vegetables are available all year. Other permanent fruit plants and trees are planted around the garden to protect the garden and provide varieties of fruit. Earthworm food baskets are placed in the garden and filled with kitchen scraps and manure to attract earthworms that make good soil. There is enough space to practice crop rotation and continuous planting throughout the year.

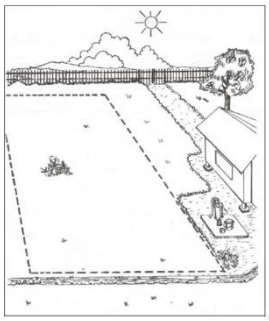
There are ten (10) steps in making an All-Year Food Garden. If you already have a garden, these steps can help you have a more bountiful yield.

Facilitator Instructions: *Put the* ***VISUAL AID*** ***poster: Ten Steps to Make an All-Year Food Garden*** *up on a wall so everyone can see it. Then lay the eight* ***VISUAL AIDS*** *pictures down on the ground randomly and ask the group to stand in a circle around the pictures. As you talk about each step, ask the group to decide which picture illustrates the step.*

Step 1 – Locate the best area for the garden

The first step is to find a good place for your garden. What do you need to consider when picking the place to put your garden?

- A GOOD WATER SUPPLY – Water is important for plant growth. In the dry season, it is a vital requirement for vegetable growth. Think of a place where you can easily obtain water for the plants.
- GOOD SOIL DRAINAGE – Ideally, plant your garden on a light slope to provide drainage, especially during rainy season. If your land is flat, dig drainage channels or ditches around the area.
- GOOD SOIL – The soil in your garden should be cleared of large rocks, trash, and other debris.
- SUNLIGHT – Your garden site should receive sunshine throughout the day. Make sure the length of the garden bed is in the east west direction, so that the plants will get sun all day long. Growing plants need sunshine to flower and ripen fruit.
- GOOD AIR CIRCULATION – Good air circulation refers to the amount of air flow in your garden area. Strong winds are not good for young plants. It is good to have natural windbreaks around, including hills, trees, and houses.



➢ Which **VISUAL AIDS** picture illustrates Step #1?

Step 2 – Provide enough space for your garden

The ideal garden size is one hundred (100) square metres. That is big enough to supply the fresh vegetables needed for a family of six every day, with some left over to give to others or take to the market for extra income.

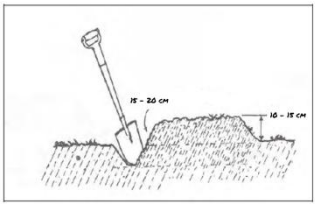
➢ Where are some places in your community that there is enough space and a good location for a garden?

There is no picture for this step.

Step 3 – Thoroughly prepare the soil and area.

What things do you do to prepare the soil and the area in your gardens? Successful vegetable gardens depend largely on how well you prepare the soil before planting. Vegetables grow and yield better in well-prepared soil.

- CLEAR THE AREA – Remove all rocks, trash, and debris from your garden area.
- CREATE RAISED GARDEN BEDS – Rather than one large planting area, make two rows of 4-6 small garden beds. Make each garden bed 1 metre by 8 metres, raised about 10-15 cm from the ground. Raising beds this way eases your work; it also helps provide paths through the garden.
- MAKE A TRENCH AROUND EACH GARDEN BED – Dig a trench on all sides to provide good drainage. The depth of the bed with the trench should be about 5 cm. Add the soil from the trench to the raised bed so the total depth of the bed from the trench is 15-20 cm high.
- ADD BORDERS TO EACH BED – If possible, grow nitrogen producing plants (GMCCs) around the edge of each garden bed to protect the bed from erosion. These plants will nourish the soil, help reduce weeds and provide added diversity in your garden. They will require consistent pruning. Another way to prevent erosion is to put sticks and rocks around the edge of the garden beds. Cover the pathways about 40 cm wide and cover them with dried twigs or straw.

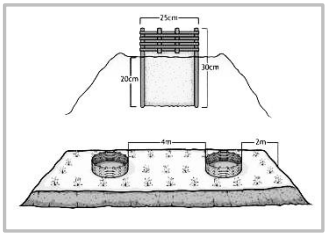


➢ Which **VISUAL AIDS** picture illustrates Step #3?

Step 4 – Attract Earthworms

- CREATE AN EARTHWORM FOOD BASKET – Two metres from the long edge of the bed, dig a hole 20 cm deep and about 25 cm wide. Make a basket of wire, or shape flexible bamboo strips around stakes, to make a round form that is about 30 centimetres high with an open bottom. Then place the basket in the hole. These baskets should be 4 metres apart.
- HOW TO ATTRACT EARTHWORMS - Put your kitchen scraps (like peelings, eggshells, and coffee grounds) and your natural fertiliser mix or some goat manure or chicken dung in the baskets first, then add grasses, weeds, and leaves. There is no need to turn the composting materials. Just keep on adding new materials. After the harvest, remove the baskets and leave the compost in the soil. The earthworms will be attracted to the "food" and they will till your soil for you as you feed them. They will make the soil more fertile.

You can add to the basket some of the organic materials we listed in the last two lessons to increase the nutrients needed in each stage of growth (for example, add 1-2 cut up banana peels to add more potassium or 1-2 dried eggshells to add calcium).

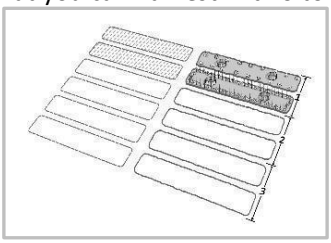


➢ Which **VISUAL AIDS** picture illustrates Step #4?

Step 5 – Plant 1/3 of the garden with early maturing vegetables

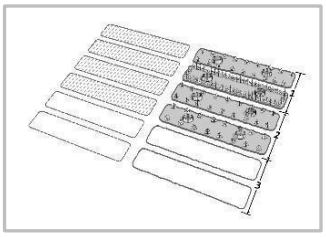
Divide your garden into three sections. Set aside the first section for vegetables that you can harvest in two to four months, such as soybeans, tomatoes, radish, mustard, cowpeas, sweet corn, sweet pepper, mung beans, and carrots. <u>Do not plant the whole section; reserve one-half of the section for relay planting</u>.

- What are some examples of early maturing vegetables in this area?



➢ Which **VISUAL AIDS** picture illustrates Step #5?

Step 6 – Plant next 1/3 with semi-annual vegetables

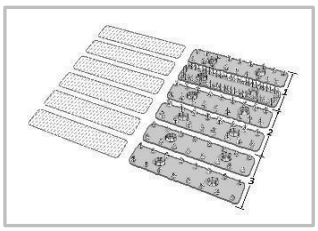


Set aside the second section for vegetables that are harvestable in six to nine months (use hoop houses when needed). These include winged bean, bitter gourd, eggplant, okra, squash, garlic, onion, cucumber, and ginger. As in the first section, plant one-half of this section and reserve the remaining half-portion for relay planting.

- What are some examples of semi-annual vegetables in this area?

➢ Which **VISUAL AIDS** picture illustrates Step #6?

Step 7 – Plant last 1/3 with annual vegetables

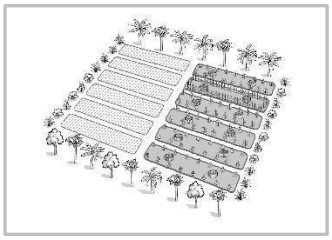


Set aside the last section for planting year-round vegetables like lima beans, sweet potato, cassava, and pigeon pea. As in the first and second sections, plant only one-half of this section and reserve the remaining one-half for relay planting.

- What are some examples of year-round or annual vegetables in this area?

➢ Which **VISUAL AIDS** picture illustrates Step #7?

Step 8 – Plant the surrounding area of the garden with permanent crops

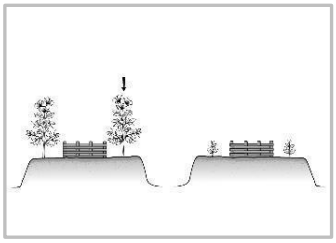


Plant the surrounding area of your garden with permanent or semi-permanent plants like papaya, pineapple, sugarcane, yam beans, banana, citrus, and short fruit trees. Put taller plants like citrus and banana trees on the north and south sides and shorter plants like pineapple and lemongrass on the east and west sides of the garden.

➢ Which **VISUAL AIDS** picture illustrates Step #8?

Step 9 – Plant reserved portion on time

Replant promptly the reserved portions of your All-Year Food Garden. This will further help ensure a continuous and adequate supply of fresh vegetables in your home. In the year-round (annual) vegetables section of your garden, plant the reserved half-portion when the first crops in the other half are about five months old. In the semi-annual vegetables section, plant the reserved portion when the first crops are about four months old. In the early-maturing vegetables section, plant the reserved portion when the first crops start to flower.



➢ Which **VISUAL AIDS** picture illustrates Step #9?

Step 10 – Practice crop rotation

When replanting, practice crop rotation. This means that you plant legumes in garden plots where other vegetables (such as tomatoes, eggplants, and okra) were previously planted and vice versa. Crop rotation helps prevent the spread of pests and diseases and also improves the fertility of the soil in your garden.

➢ There is no picture for this step.

Facilitator: *Review the 10 steps as a group.*

Benefits of All-Year Food Gardens - 17 min

Many farmers use all of their land to plant crops to sell to make a living. This leaves farmers with limited nutrition options for their own families.

This true story in one community shows what can happen when a farmer uses these methods.

The Sugarcane Community Garden

In Asia, there was a village of sugarcane farmers. They grew this one crop each year. After the harvest was over, their families would have money for a few months. At planting season, they would plant new sugarcane and then leave it to grow. The community called this the 'dead season', because during this time, work in the farms was very minimal and only required some weeding and caring for the soil. They also called it 'hunger season'; because the money from harvest ran out at this time, leaving people without money for food. Families often took out loans to ensure that there was food on the table at least once a day.

Mira and Joseph feared the dead season. Their income was almost always insufficient for the basic needs of their family with six children and paying their school fees was a frequent problem. The children almost always got sick during the dead season, and they complained constantly of being hungry.

One year, Mira and Joseph joined a farming group that taught them about All-Year Food Gardens. The farming group identified some land in the community where a shared integrated garden could be developed. Families—including men, women, and children—all worked together to prepare the land, make earthworm food baskets, plant seeds, and use organic fertiliser. Instead of dreading the children's complaining, Mira and Joseph found they looked forward to spending this time together as a family. The children enjoyed learning and even the youngest loved to help dig in the dirt and add scraps to the earthworm food basket.

Soon their harvest of vegetables was bountiful. Mira and Joseph, along with the other families who participated, had enough nutritious food for their whole family during the dead season. They couldn't eat it all, so Mira joined some others in setting up a stall in front of the garden to sell the extra produce. Many people in the village came to buy their vegetables. So, the garden not only provided healthy meals for their families but also gave them additional income for school fees and other necessities.

Mira and Joseph were hopeful for a brighter future because they learnt new ways of providing for their family. Their children were growing well and didn't get sick as often, and they were even able to help needy people in their community by sharing with them.

SMALL GROUP ACTIVITY - 7 min

- What were some of the benefits you heard in the story of having a garden that provides food all year long?
- Can you think of any other benefits?

REPORT BACK

Facilitator: *Ask the groups to share their responses. Then use the following list to share any benefits that the groups did not cover.*

There are many benefits to having home and community gardens that produce food all year long:

1. **EATING FRUIT AND VEGETABLES EVERY DAY**

Fruits and vegetables are essential to our daily diet. Rich in vitamins and minerals, they can provide many of the nutrients required for our bodies.

2. **SIMPLE AND INEXPENSIVE WAY OF PROVIDING FRESH FOOD FOR YOUR FAMILY**
   These gardens can reduce a family's daily food expenses while providing healthy food for families.

3. **VEGETABLES FROM HOME AND COMMUNITY GARDENS ARE BETTER AND SAFER**
   Fresh vegetables from your own gardens are better than those sold in the markets, which are polluted by dust, insects, and human handling. If you grow your own vegetables, you also know exactly what chemicals have or have not been used to grow them.

4. **BUILDING GOOD RELATIONSHIPS**
   Everyone can help manage an All-Year Food Garden. Even small children can contribute. They can help with daily chores, which will help them to learn responsibility and ways to take care of themselves. Home gardening can bring a family and a community closer together. Working together helps strengthen relationships.

5. **OTHER BENEFITS FROM ALL-YEAR FOOD GARDENS**
   Having many different types of plants around the house or community will help control pests and diseases. These gardens can also improve the appearance of your land. Land with lush-growing vegetables is very pleasant to look at.

The All-Year Food Garden will produce a continuous and sufficient supply of fresh fruits and vegetables for your family every day. This is not the only way to do a family or community garden. It is one way to develop a home garden that can provide adequate food with minimum cost, labour, and land utilisation. It is meant to be used as a guide, and you may find other ways to improve your garden that you can share with others.

Application **- 10 min (45 min with activity)**

LARGE GROUP DISCUSSION - 10 min

- Had any of you heard of an All-Year Food Garden before today? Do you use a garden like this at home?
- Which ideas from the All-Year Food Garden do you want to try at home?
- Does your church have a garden? Do you think an All-Year Food Garden would be a good project for a church to do?
- What land could be used for a church garden?
- How could this kind of garden help to show God's love to those in our community?
- What way could the church use extra income from selling produce to glorify God?
- Do you want to make a plan to create an All-Year Food Garden on your land or in your community?

LARGE GROUP ACTIVITY - 30-35 min

Facilitator: *Depending on time and location, you can work together to make earthworm food baskets using the instructions below.* Gather these materials ahead:

- *7-8 sticks about 30 cm long*
- *Weaving material like bamboo or local soft material that is natural but not easily degradable.*

Take the students outside and dig a hole 20 cm deep and about 25 cm wide (or a smaller hole with similar proportions). Plant sticks around the perimeter of the hole—around 8 sticks. Weave the bamboo material or leaves within the sticks to make a basket. Let students participate and, after lunch or dinner, put all the food scraps in the basket.

Lesson 8: Pest Control

Main Ideas

1. There are natural ways to get rid of pests and diseases that threaten the health of your crops.
2. God has already provided many plants and animals in your community that can get rid of unwanted pests.

Materials

1. Visual Aids:
    a. Plants That Naturally Repel Insects cards (one set per group, cut as 11 strips)
    b. Bat House (one copy)
    c. Insect Hotel (one copy)
    d. Beneficials and Pests cards (one set per group, cut into 24 cards)
    e. Leaf Damage cards (one set per group)
    f. Hoop House (one copy)
    g. Paper Barrier (one copy)
    h. Non-toxic, Homemade Remedies cards (one set per group, cut into 9 strips, plus one uncut copy to leave with church)

Defending Against Pests and Diseases - 25 min

SMALL GROUP DISCUSSION - 5 min

- Make a list of all the insects and bugs that you have on your land.
- Decide which of them are harmful and which are helpful.
- Are there any that are sometimes harmful and sometimes helpful?

REPORT BACK – *Ask groups to share their lists of helpful and harmful animals and bugs. Write them on the board.*

There are two kinds of insects in our gardens:

a. Insects that eat insects are called 'Beneficials'. They are helpful. They help protect our plants.
b. Insects that eat plants are called 'Pests'. They are not helpful and can damage our crops.

God created all things for a purpose. Even the animals and insects on our "harmful" lists exist for a good purpose. But even good plants, animals, and insects God created can be pests in our farms and gardens if they damage our plants and crops. Remember, God gives us the job of stewarding and ruling over His creation. To steward creation well, we need to recognize pests and learn to defend against them.

LARGE GROUP DISCUSSION

Insects and bugs are not the only thing that can harm your crops.

- What else can you think of that can cause problems for your crops?
    - *Students may mention cows, rabbits, birds, rats, mice (any animal that will eat plants can damage crops)*
    - *They also mention things like mould or mildew.*

We can categorise most things that threaten the health of our crops into—pests and diseases.

1. A pest is any living creature that causes damage to our plants, including some birds, animals, and insects.
2. Diseases are caused by fungi, bacteria, and viruses.

Discuss:

- How do people control pests and diseases in plants in your community?
- Do the methods work well?
- Do you spray chemicals? Why or why not?
- What do you think happens to the helpful insects and microorganisms when we spray chemicals on our plants?

Pests can destroy our crops. They are a serious problem, but when we use chemicals to kill the pests, we also kill beneficial insects and microorganisms.

Chemical sprays are not the only or the best way to deal with pests. In the rest of this lesson, we will look at three ways to defend our crops against pests and diseases:

1. Prevention – keep them from coming to your farm
2. Attracting more Beneficials – helpful insects, animals, and micro-organisms
3. Manage or control them

Prevention - 20 min

LARGE GROUP DISCUSSION - 8 min

The easiest way to stop insect damage and diseases in your garden is to discourage them from coming in the first place. This is called prevention. A healthy garden is the best defence.

Cleaning our teeth is a similar example.

- Why is it important to clean our teeth? *Prevents harm to our teeth*
- What would happen if you don't clean your teeth? *Teeth get damaged, rotten, can die or fall out.*
- Do you see the harm that is done by not cleaning your teeth after one day? One week? One month? One year? *Not in the short-term, but over time you do see the harm that is done.*

This is similar in farming. If we keep our farm clean and healthy, it prevents pests from destroying our crops.

We've already learnt lots of things we can do to have a clean, healthy garden. Can you remember any of them?

- What can we do to build a healthy farm and garden?

Facilitator: *If any of these answers don't get mentioned, remind the students of them. Then explain how these methods for building healthy soil also help to prevent pests and diseases.*

- **Build healthy, organic soil**. Natural composting methods like earthworm food baskets, mulching, and covering your soil with compost or natural fertiliser is the best way to develop strong, healthy plants that resist diseases.
- **Plant a variety of crops.** Insect pests are often plant specific. When plantings are mixed, pests are less likely to spread throughout a crop. When the same area of land has many kinds of plants and organisms, it will attract different kinds of insects. The good insects will control the bad insects.
- **Rotate crops each year** to avoid re-infestation of pests. By rotating crops, you will:
    - Interrupt pests' life cycle
    - Remove their food sources
    - Confuse them because their habitat is affected

There are a few other things we can do to keep our gardens clean and healthy:

- **Use seaweed mulch or spray** (if you have access to it). Along with the benefits we discussed in lesson 5, seaweed also repels slugs.

- **Pull out any weak plants.** They may already be infected. If left in the ground, they will attract pests. Pull the plant and dispose of it away from the garden area.
- **Minimise uncontrolled debris around the garden**. Clear garden area of debris and weeds, which are breeding places for insects. Use clean mulch.
- **Keep foliage dry**. Water early in the morning so foliage will be dry for most of the day. Wet foliage encourages insect and fungal damage to your plants. Consider simple drip-irrigation for delivering water to the root systems without wetting the foliage (for example, gravity buckets or water tanks attached to hoses with holes poked in them).
- **Disinfect**. If you've been working with infested plants, clean your tools before moving on to other garden areas. This will keep from spreading diseases to other plants and from carrying pests to your healthy crops.

SMALL GROUP DISCUSSION - 5 min

- Which of these activities do you already do?
- Which of these ideas are new to you?
- What is one idea that you want to try on your plants?

REPORT BACK

Plants that Repel Insects - 15 min

SMALL GROUP ACTIVITY – Groups of 4-5

God has already given us some natural ways to keep harmful insects away. These are often freely available in our community, or we can grow them and share them with others.

- What are some plants you already use to repel insects in your community?

Use one set of ***VISUAL AIDS: Plants that Naturally Repel Insects cards*** in each group.

Each person in the group picks at least one card. Look at the plant and think if you have this plant on your land or somewhere in your community. Look at the pests that the plant naturally repels. Decide if you have seen this pest on your land. Think about planting some of the plants that repel pests that you have seen on your land. See if anyone in the group has some of these plants to share with others.

For example:

- Based on the picture on this card, do you have marigolds in your community or on your land?
- Do you have mosquitos and aphids?
- Does anyone in your group have marigold plants they can share with others?

Plant	To Repel
Marigolds 	Mosquitoes, aphids 

REPORT BACK – *Ask each group to share the plants they recognise in their community that repel pests.*

Attract Beneficial Animals and Insects - 15 min (45 min if you build an insect hotel)

LARGE GROUP DISCUSSION

At the beginning of this lesson we asked, 'What animals or insects on your farm are helpful or beneficial?' These Beneficials help us by getting rid of pests and their larvae (babies). Now we're going to look at how to attract two specific Beneficials: bats and insects that eat other insects. We can intentionally attract them to our farms so they can thrive and do the work of preying on harmful pests. Beneficials are free labourers on your farm that work for you.

To attract them you need to provide three things:

1. Food
2. Shelter
3. Water

Attracting Bats:

- Bats are great hunters of mosquitoes and many other harmful insects. Each bat usually eats thousands of insects each night.
- Bats need shelter that is near a water source and food source (night-blooming flowers such datura, moonflower, four-o'clock, yucca, evening primrose, night-blooming water lily, night-blooming jessamine, cleome, and nicotiana.)

We have a design that can help you to build a basic bat house. *Show **VISUAL AID: Bat House Design***

Attracting Good Insects:

- As we have said before, there are beneficial insects and pests. The Beneficials will eat the pests that eat your plants. So, you want to attract Beneficials by providing them food, shelter and water.
- Plant a wide variety of flowers. Beneficials need food to survive and reproduce. Having certain flowering plants in or near your garden supplies that food in the form of nectar and pollen. The following flowers attract Beneficials:

  1) Plants in the daisy family, such as aster, cosmos, and yarrow

  2) Plants in the carrot family, such as cilantro, dill, fennel, parsley, and wild carrot

  3) Alyssum and other members of the mustard family

  4) Mint

  5) Buckwheat

- Build insect hotels. *Show **VISUAL AID: Insect Hotel.*** You can use materials that you already have, such as boards, pallets, newspaper, straw, plastic bottles, bamboo, pipes, tin (or other roofing materials) and even rotting logs to provide an attractive place to live. It is important to provide a roof and walls so that after rain, water will not get into the insect hotel and make it soggy. Most insects like slightly damp conditions, but not soggy. One end of the structure should be open and the inside should be stuffed with a variety of materials explained in the handout. Insect hotels do best in a protected area away from a lot of wind. Try building one together using the handout.

***Facilitator:** If there is time, have the students work together to build an insect hotel using materials you find around the property and following the instructions on the handout.*

SMALL GROUP ACTIVITY - 5 min

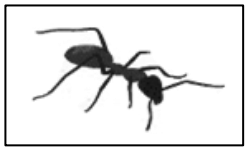
Use the **VISUAL AIDS: Beneficials and Pests cards**. Go through the cards and decide if you think the insect is beneficial (helpful) to a garden or a pest (harmful). Make two piles—one pile of helpful Beneficials and one pile of harmful Pests.

For example:

- Is the Cabbage Moth a helpful or harmful insect?
- Is the Ant a helpful or harmful insect?

Cabbage Moth

Ant



Facilitator: *Once all the groups have made two piles, ask them to count how many are in their Beneficials pile. There should be 12 Beneficials and 12 Pests. The way to tell between the two is the shape around the insect. The Beneficials are inside a rectangle and the pests are inside a circle. Then ask the groups to look at both piles and identify Beneficials they have in their area and the pests they have in their area.*

Pests (Harmful) Insects		*Beneficials (helpful) Insects*	
Cabbage Moth	*Cabbage Worm*	*Ant*	*Bee*
Cut Worm	*Flea Beetle*	*Earwig*	*Green Lacewing*
Mite	*Parsley Worm*	*Lady Bug*	*Parasitic Wasp*
Squash Vine Borer	*Tomato Horn Worm*	*Centipede*	*Ground beetle*
Carrot Rust Fly	*Mexican Bean Beetle*	*Praying Mantis*	*Spider*
Slugs & Snails	*White Flies & Aphids*	*Predator Fly*	*Small Pirate Bug*

Manage & Control Pests - 20 min

SMALL GROUP ACTIVITY - 5 min

Use the **VISUAL AIDS cards: Leaf Damage**. Put all the cards on the ground and look at the pictures of the leaf damage on each card. One at a time, point to a card if they have seen that kind of leaf damage. Then look at the pests that commonly cause that damage. Keep the cards that people in the group pointed at for the last activity.

Facilitator: *If there is time, you can do this activity as a game by folding each card in half and placing them so that only the leaf damage is visible. Have students guess what kind of insect causes that damage before revealing the answer.*

Let's do an example:

- Have you seen this kind of damage on some of the leaves of your plants?
- What pest do you think caused this damage?

Damage	Pest
Chewed or skeletonized leaves 	Beetles, caterpillars, and sawflies 

LARGE GROUP DISCUSSION

If you keep a healthy garden, you will have fewer pests and diseases. But there will always be some pests that you will need to manage and control. Here are three ways to do that:

Traps:

- Did you know that bugs are colour sensitive? Certain bugs are attracted to certain colours.

To make a trap, paint any surface one of the colours below, then brush on something sticky like used car oil or used cooking oil to trap the bugs that fly into it.

These colours attract certain bugs that we don't want:

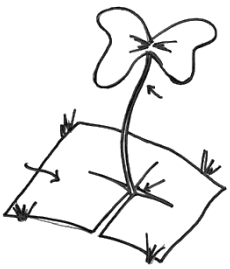
- **Yellow** attracts whiteflies, fruit flies, male winged scales, leafhoppers, fungus gnats, midges, male winged mealybugs, leaf miners, thrips, psyllids, and winged aphids.
- **White** lures whiteflies, plant bugs, cucumber beetles, and flea beetles.
- **Light blue** attracts flower thrips.
- **Red spheres** attract the flies whose eggs hatch into apple maggots.

Barriers:

- Cover your garden area with mosquito net or garden material netting if available in your area. This will protect against birds and larger pests.

- *Show **VISUAL AID: Hoop House***. A Hoop House is like a miniature greenhouse for your seedbeds and young plants. Most often it is used to protect your plants against cold weather or wind. It also acts as a barrier against pests. After you build a simple frame, cover it with clear plastic.

- *Show **VISUAL AID: Paper Barrier**.* Cabbage moth larvae kill young sprouts of broccoli, cabbage, Brussels sprouts, kale, and cauliflower. To control them, use scraps of waxed cardboard from milk cartons. Cut the waxed cardboard into 5 cm squares and slit one side into the centre; make another small slit crossway. Open the longer slit and slide the square so the seedling stem is in the centre. This prevents the cabbage moth from laying eggs at the base of the sprouts. Leave in place—as the plant grows it will simply push the slit open wider. Be sure to apply as soon as the sprout appears, or the moth will beat you to it!



Sprays:

- Sprays are a last resort.
- Instead of spraying the whole garden, try to spray the pests that you see attacking your plants.
- There are some natural sprays that you can make yourself. We will look at these next.

SMALL GROUP ACTIVITY - 10 min

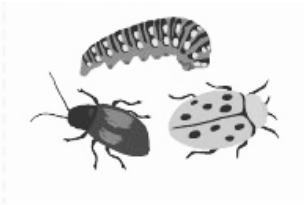
Use **VISUAL AIDS cards: Non-Toxic and Homemade Remedies** for this sorting activity.

1. Put all the new cards on the floor or table.
2. Take out the Leaf Damage cards from the last activity and see if you can find the same pests on the new set of cards.
3. When you find the same pest, read the mixture on the handout that is used to kill the pest.
4. Discuss if you think the mixture is easy to make and use. If so, put it in a pile. If the mixture is too hard or you don't have what you need, put it in a different pile.

For example:

- For the card that had this leaf damage from the beetle, caterpillar and sawflies, it looks like a mixture of hot pepper sauce could help get rid of the pests.

Damage	Pest
Chewed or skeletonized leaves 	Beetles, caterpillars, and sawflies 

Mites and other insects 	Mix two tablespoons of hot pepper sauce, cayenne pepper or ginger with a squirt of soap into a litre of water. Let stand overnight, then stir and pour into a spray bottle and apply. Shake container frequently during application. Test on a portion of the plant and add more water if it damages the leaves.

REPORT BACK – *Ask the groups to share the mixes that were in their pile that are easy to make and would kill the pests they have seen in their area. Give a copy of the* ***VISUAL AID: Non-Toxic Homemade Sprays*** *to the church after the activity.*

Conclusion - 5 min

- What are some natural ways you are already controlling insects and diseases in your community?
- What are some new ideas you have learnt today?

Lesson 9: An Integrated Farm

Main Idea

- God has provided many ways that we can strengthen our farms by using the resources we already have on the farm. As we implement these methods it causes the farm to produce more.

Materials

- Visual Aid: Gift or Trash posters (one copy of the 7 pictures, cut into cards)
- Flip Chart paper / Notebooks

Introduction – Resources Activity - 10 min

LARGE GROUP ACTIVITY

We're going to start this lesson with an activity. Each of these posters is something from around our farms. Together we are going to separate these items into two groups: Trash (rubbish that must be discarded) on the left side of the room and Gifts (something God has given us that is useful) on the right side of the room.

Facilitator: *Handout the* ***VISUAL AIDS: Gift or Trash*** *seven posters to people in the group. Ask one person at a time to stand and show the group the poster. Ask the group which group it should go in – Gift or trash. Then have the person stand in the area representing 'gifts' or 'trash'. End the activity by saying:*

Actually, ALL of these things should have gone in the "Gifts" group. Each one of these things can be used to strengthen our farms and improve our crop production!

God has created everything. When we believe everything we have are gifts from God, we will discover ways we can wisely use them as resources to help our farms. Sometimes we just don't see all the resources He has given us. As we look around our farms, there may be things we have overlooked that are gifts from God.

In this lesson, we're going to look again at what God has given us and how we could use it to improve the production on our farm.

The Integrated Farm - 20 min

LARGE GROUP DISCUSSION

Let's start with a story to see how James and his family are getting along after the training he attended…

James and his father had worked so hard this year—learning new techniques for planting without ploughing, making dibble sticks, making their own fertiliser, and trying to control pests without chemicals. Some nights, after working so hard, James barely had the energy to eat dinner before he fell into bed and slept like a dead man. Meanwhile, his mother and sister worked hard in the kitchen, in their new vegetable garden, and tending to the family's cow, chickens, and two goats.

One of James' biggest worries now was keeping everything on the farm carefully separated. He often scolded his sister to be careful where she threw the fire pit ashes and to keep the animals well-pinned on the other side of the property. How many times had his father told him the story of the time when he was a boy and the cow had gotten into the cassava field and eaten itself sick?! And, of course, they kept the stinky latrine as far from everything as possible!

One day the agriculture trainer came by to ask how everything was going since they had come to his last training. James showed him around proudly, pointing out everything they had accomplished. He was embarrassed only when they stumbled upon his sister coming out of the latrine behind the house.

Afterward, James, his father, and the trainer sat together for a cup of tea. The trainer said, 'You have done so well here. I can see that God is blessing your hard work. But I'd like to give you one more idea.'

'What is it?' James sat forward, eagerly. Even his father looked interested.

'Integrate. Don't segregate,' said the trainer. James and his father looked at each other, confused. The trainer took a sip of tea before explaining, 'Segregate means to keep everything separate, the way you're doing now. The animals over there. The crops over here. The household latrine over there. But when we integrate, we find ways to use all that we have on the farm to benefit the other parts of the farm.'

James shook his head. He'd heard the story about the cow in the crops one too many times to get excited about this idea. But his father said, 'What do you mean? What could we do differently?'

'Well,' said the trainer, 'For example, do you know where fruit trees most love to grow—where they grow quickly and produce the very best fruit?' He waited for a moment and then said, 'In old latrine pits!' James' father burst out laughing. The trainer continued, 'And those the dried corn husks in your field can be used as bedding for your animals. Then after a few weeks, the old bedding (that has animal manure in it) can even be used as compost to nourish the soil!'

The trainer told them several more surprising ways to 'integrate, not segregate.' Soon, James was laughing and smiling, too, and thinking how good and wise God is to have created a purpose even for latrine pits and their dried crop residue. He chuckled, 'God really did think of everything.'

- In what ways did James and his father learn to integrate their farm?
    - *Holes from latrine deep pits used later to plant trees after one year.*
    - *Use crop residue as animal bedding and then use as compost.*
- What other ideas could you share with James? What are some ways you integrate different aspects of your farm? *(give time for sharing)*

Facilitator Instructions: *Only share the ideas that were not mentioned and are relevant to the group.*

- *Cow and goat manure can be composted and used in organic fertiliser.*
- *Use wood ashes (potash) as fertiliser and in soap making.*
- *Control weeds with mulch that is later added into the soil as compost.*
- *Use moveable cages / pens where animals might feed on and destroy weeds, scratch the soil, and deposit manure in garden areas.*
- *Allow chickens to roam in gardens and crop areas. They are great at eating a lot of bugs and caterpillars.*
- *Use crop residues as mulch, compost, kindling, building material (roofing or mixed with clay for bricks.), and as animal feed.*
- *Put small animal (chickens, guinea pigs, rabbits) pens and outbuildings under fruit trees or over fishponds. Their waste makes great food for fish and trees!*
- *Use fruit and nut trees as fence posts, wind breaks, and to prevent erosion.*

We've listed so many good ideas to integrate everything on our farm and use all that God has given us. Many of these ideas do not cost anything but only take a little time and planning. **When we integrate on our farms,**

we can use all of our resources wisely. Integrating helps us be good stewards of the resources that we have. This is a way of maximising production (food for the family, products for sale) and minimising costs (purchasing fertiliser and feed for animals) which means having a profitable and successful farm.

- How can having a profitable and successful farm honour and glorify God?
- What can we do with the abundance that we will have?

Typically, an integrated farm increases income. With more income we are better able to meet our family's needs, send our children to school and be generous with the poor. Being good stewards also honours God and demonstrates His goodness to our neighbours.

Now let's take a closer look at some ways to integrate animals on our farms and see what we can learn from each other.

Integration of Livestock - 25 min

Most farmers already integrate animals into their farms and are well informed about the benefits of doing so.

- How many of you already have animals on your farms? Which ones do you have?
- From your experience, what are some of the benefits of having these animals?
- What are some of the challenges of having these animals?
- Which animals would you like to add to your farm? What keeps you from adding these animals?

Farmers know that animals are useful for their farms. But often the costs of buying and maintaining livestock can seem too high. With so much information and expertise already available, let's use your experience to find ways we can reduce costs and increase farm production so purchasing and caring for livestock is possible.

LARGE GROUP ACTIVITY

Facilitator: *Make the list on the board.*

Let's make a list of the many different types of livestock people would like to have on their land.

SMALL GROUP ACTIVITY - 7 min

Facilitator: *From the list of animals, assign different animals to each group and ask them to answer the following questions:*

- What does this animal have, do or produce that can be useful in other parts of the farm or for the family?
- What does this animal need, and where on the farm can those things be found?
- What are some resources that you already have on your farm that you can use to reduce costs of having this animal on your farm? For example, what could you use to feed your animal or build a pen?

REPORT BACK

Have groups share what they came up with. Below are some ways to utilise livestock on the farm to enhance production and increase income. Highlight these points as needed:

- *Fertiliser – Livestock's waste can increase crop yields because almost every kind of manure makes great fertiliser. Manure from penned animals is easy to collect.*
- *Income – Sale of eggs, milk, or the livestock themselves. Having different sources of income is helpful because if one fails, you aren't left with nothing.*
- *Eating livestock products – Livestock creates a variety of foods that provide nutrition for the family.*
- *Labour strength and power – For fetching water, transporting people, pulling carts with supplies and farm equipment.*

There are so many benefits to integrating livestock on our farms, but often the barriers and challenges keep us from adding them. When we see the ways to reduce the costs and increase our production using the resources God has already placed on our farms, we can find ways to overcome the challenges.

WITH A PARTNER
Take a few minutes to share with the person next to you what animal(s) you would add to your farm if you could and the challenges you will need to overcome. Pray for each other that God would guide your steps, give you wisdom to solve the challenges and provide what you need in His way and time.

Facilitator: *After giving a few minutes for sharing and prayer, ask the group which animals they would like to learn to raise and make note if there is a common interest in a specific animal so you can suggest starting a related farming group in the next lesson.*

- What animals do you want to add to your farm?

Integration for Weed Control - 13 min

Now let's move from animals to weeds! Weeds seem to cause everyone problems, and we are always looking for a solution to weeds in our gardens and farms. However, just as God made every insect and animal for a purpose, He also made every plant for a purpose.

- Why do you think God made weeds?

Facilitator: *After giving some time for this discussion (and probably some laughter!), explain:*

Weeds have strong roots and are very hardy. The thing that makes them so troublesome in our fields and gardens also makes them very good at preventing erosion! Many weeds give back to the soil the same way GMCCs do. They also make good food for animals.

Yes, God even made weeds for a good purpose. Instead of grumbling about weeds, we can thank Him for His good design. And, as stewards of creation, it is our job to keep them from getting out of control in our crop areas and gardens so that our plants can thrive. Unfortunately, there is no easy way to remove weeds. However, there are some things we can do with resources on our farm to keep them under control.

LARGE GROUP DISCUSSION

- What are some of the ways farmers in your area control weeds?
- What are the benefits and challenges of each method?
- Can you think of some other ways to use resources already on our farm to control weeds (Integration)?

Facilitator: *Make a list on the board, add anything from the list below that students don't mention.*

Ways to control weeds:

- **Cutting back weeds:** Cutting the weeds can slow their growth and many times the weeds can be used as feed for other animals (rabbits or goats).
- **Physical removal of weeds:** This is the old effective way of removing weeds and their roots. Often this is done with a hand hoe, or some other mechanical method. This is effective but can often lead to stimulating growth of other weeds, is labour intensive, but does not cost much.

- **Mulching (ground cover):** Mulching can greatly reduce weed growth by making it difficult for them to grow. Without sun, many weeds will struggle. Mulch should be applied after the crop is already established and weeds are still small. Be careful of not making mulch too deep or get too wet that it smells bad and looks soggy.
- **Shading of weeds (Green Manure Cover Crops GMCCs):** This works best with taller crops, like maize. Planting leafy legumes in between the crop rows, can greatly reduce the sunlight that weeds need to grow. These legumes can grow thick, which can reduce weeds. Some also provide additional crops. Some legumes do climb and can begin to pull down the crop if not managed.
- **Use of animals to eat weeds:** Animals can effectively help control weeds by grazing. Cattle, goats, sheep and pigs will eat a variety of weeds. It works best after harvest and before replanting, and /or by confining animals to one area of a field. Chickens, ducks, rabbits, and guinea pigs should be kept in movable cages. This does take effort and may require the construction of movable pens or fences.
- **Maintain crop fields:** After harvest, weed seeds start to increase. Interrupt the natural cycle of weeds by clearing the fields along with the methods above.
- **Flooding:** *(mention this one only if the students bring it up)* We don't recommend this method because it uses a lot of water, doesn't work with all crops, and can wash the nutrients out of the soil.
- **Chemical control of weeds:** This is another one we do not recommend. Chemicals may be the quickest way to kill weeds, and often are the least expensive method. However, they have many drawbacks. Many chemicals are toxic! They leave residues on the plants that are poisonous to people and animals and many are poisonous if they are even touched by humans. They can also kill other healthy plants, insects we need for pollination, as well as contaminate water sources. They also require careful storage. God gave us many better ways to control weeds than chemicals!

- From the list we've made together, are there any new ideas you would like to try in the future?

Facilitator: *Allow for several people to give their examples and opinions on what they feel would work well in their fields.*

Controlling weeds is a difficult task. There is no one solution that we can recommend. The best way is to test different methods and find out what works best on your farm. Learn from others who farm in the same area as you. They will have similar conditions and are some of the best people to learn from.

Conclusion - 7 min

We have discussed ways to integrate (not segregate) our farms so that every part of our farm can benefit the other parts of the farm. We have learnt many ways to be good stewards of all the resources on our farm.

- What have you learnt from this lesson about using all the resources on the farm?
- Is there anything on the farm that you see differently now, as something to steward well or care for?
- Is there anything you learnt a new purpose or use for?

Let's have a few people share their ideas.

In our next lesson, we will start to look at what we can do together as farmers to help each other find solutions to challenges we face. We'll also talk more about how our prosperous farms can glorify God and bless our community.

Lesson 10: Working Together to Glorify God

Main Ideas

- Work together to identify problems and use what we have available to solve them.
- Share with others and give God the glory.

Materials

- Visual Aid: Learning More cards (print and cut apart the 10 cards)
- Flip Chart paper / Notebooks

Introduction - 10 min

Throughout this module we have focused primarily on God's call for us to steward all that He has made. This includes all of creation around our houses, our towns, and also our land. We have also talked about healthy soil, nutrients, controlling pests and creating well-planned gardens. We do understand that farming is actually very complicated work! In fact, to be a good farmer you need to be knowledgeable in many other areas including seed reproduction and storage, livestock care, weed suppression and farm management. Farmers use many skills every day to be successful. We know that this is just an introduction and there is much more that we can learn about farming and agriculture. There are many good organizations that are experts in agriculture, and we encourage you to contact them to learn more. In this lesson, we talk about how to continue your learning! But before we do that, let's consider the positive effects that productive farming could have on a whole community.

SMALL GROUP DISCUSSION

- How can a farmer have a positive impact on the community? Try to think of at least 10 ideas.

REPORT BACK

Facilitator: *Ask each group to share 2-3 ideas. Each group add new ideas and not to repeat any.*

The Ripple Effect - 15 min

LARGE GROUP DISCUSSION

Have you ever considered that the result of a farmer's work is needed by everyone every day? How many professions do you know that are needed every day? Not even doctors are needed every day. We all need food to survive – everyday! Farming that produces healthy, fresh food benefits our whole community.

LARGE GROUP ACTIVITY

Facilitator: *Find a large bowl or platter and pour water into the bowl. Put the bowl on the ground. After explaining the activity, ask a volunteer to come up and carefully drop two or three small rocks into the bowl one at a time.*

Notice that the water is still and flat in the bowl.

- What happens to the water when the rock is dropped into the water?
    - *There are many ripples that go out from the point the rock hits the water.*

This is what people call the 'ripple effect'. This refers to the way one action can make an impact that spreads to affect many other things—either positive or negative.

LARGE GROUP DISCUSSION

- Describe what happens when you have a good harvest and plenty of healthy food – How does it benefit your family, your children, your health, your finances, your community? What is the positive 'ripple effect' of having plenty of healthy food?
    - *Family is healthy and strong and able to work and go to school*
    - *Enough money for family, food, education and to share with the poor and people in need*
    - *People are happy and enjoying life*
    - *Community is happy and able to solve problems*
    - *Our lives are a testimony of God's goodness*
- Describe what happens when you have a poor harvest. What is different? How does it affect your family? your health? your finances, your community? What is the negative 'ripple effect' of not having enough healthy food?
    - *Sicknesses and poor health*
    - *Lack of money for family, food, education*
    - *More expenses for sickness*
    - *Kids miss school and adults miss work*
    - *Life is hard and people struggle just to survive*

Wise farming can produce an abundant harvest of safe and nutritious food that benefits a community in many ways. So, how can we improve our farming skills so that our families and community will experience the positive ripple effect in every area of our lives?

For the rest of this last lesson, we will think about what farming needs we have and work together to make a plan. What we will do together in class today will help you prepare to implement your plan after the training!

Read Ecclesiastes 4:9-12.

- What does this verse teach us that we can relate to farming?
    - *We are stronger when we work with others.*
    - *We can get a better return for our work.*
    - *We can help each other when we have problems.*

We know that when we work alone, we are more likely to fail, especially when we face hardships. We also know that when we work together, we can accomplish so much more. Some communities have already started gathering farmers together to learn more about new farming techniques or to solve common problems on their farms. You may have some farming groups in your community that you can join, or you may want to start a new farming group. The next five steps will help you start a new farming group.

Step 1: Identifying the farming priorities - 25 min

LARGE GROUP ACTIVITY

Now it is time to think about the farms, crops, and animals in your community so we can take action. We are going to identify the highest priorities so we can work together on them.

First, as we said before, there are many valuable topics in farming. We only covered a few of them in this module and some we just mentioned. Let's review some of the farming topics that were briefly discussed but not taught.

- Which topics would you like to learn more about in the next year?

Facilitator: *Review the* ***VISUAL AIDS: Learning More cards*** *one at a time as a group to identify which ones they want to learn more about. Ask the local leader to make two piles as you read each card – one for topics to learn more about and the other for the rest.*

Next, we will identify what are the current farming needs or problems you are facing as a community. Is it pests, poor soil, lack of manure, or lack of water or something else? Next, we will think of people and organisations that can help us with these topics, and we will take time to pray.

Take 15 minutes to do this now:

1. Reread only the cards of the topics you want to learn more about in the next year.
2. Make a list of issues or problems that need to be addressed in your community about farming.
3. What experts are in your area that may be able to help with these topics?
4. As a group pray for God's wisdom and direction.

Once you have a list of issues, you need to decide which are the most important ones to work on first.

- Which of the issues you discussed are the most important? Go through the cards you want to learn about this year and make a new card for any additional issue to program. Reread the cards and pick the top three most important cards. Then stack them in order of importance with the most important on the top.

Facilitator: *The group can use a seed voting method or any other way to pick the top three priorities.*

Step 2: Create Farming Groups - 5 min

Now that you know what is important you can join a farming group in your area or if there isn't one in your area, those that are interested can work together to start one. A farming group allows people with a common interest or challenge to learn from each other and find helpful resources to solve problems. Starting a new group is actually very easy. You may even decide to have a few different farming groups to focus on different issues.

- How many of you are already involved in a farming group?
- What are the benefits that you have experienced?

To start a farming group, you will need to answer the following questions. For our lesson today, focus on the issue you decided was most important and discuss these questions to learn how to start a farming group. Every time a farming group is started it is wise to talk about these questions.

1. **What is the reason for the group?** For example: To learn a specific new farming skill, to solve a common pest or disease problem, to work together on a specific farming project, or to research which variety of vegetable seeds to use.
2. **Who is the Leadership Team?** This group of 3-4 people will be responsible for organising meeting times and leading the meetings. This group could come from within the church or include community leaders. You could agree to rotate responsibilities.
3. **Who will participate in the group?** Will they only be people from your own community or 2-3 communities? Will it include women, men, youth?
4. **How often will you meet?** When? Where?

Step 3: Put together an Action Plan - 45 min

Next, you will need to plan as a group, to decide HOW you wish to address this problem and/or take action.

SMALL GROUP ACTIVITY

***Facilitator**: Remind the group that we are forming just one farming group and making a plan. If the group is large, divide into groups of 8-10 but have both groups focus on the same farming topic. Write the steps below on the board or explain each step and allow time for the groups to complete each step before explaining the next step.*

Take 30 minutes to go through the steps below:

1. Pray about the issue you decided was most important and ask God for guidance and wisdom
2. Identify potential solutions and resources
    a. Spiritual Solutions – Pray and seek God's guidance and determine to pray for your farm.
    b. Local expertise solutions – Who is available locally to help?
        i. Local farmer who is very knowledgeable
        ii. Government Agriculture Extension Officers
    c. Other solutions – What outside solutions might be available?
        i. NGOs, Christian agriculture trainers, natural and organic solutions
        ii. Trainings available like Farming God's Way, Conservation Agriculture, Natural Farming
3. Decide what to do and who will take action
    a. Discuss WHAT is needed to be done
    b. Agree WHO will do it
    c. Discuss HOW they might be able to do it
    d. Discuss WHEN it needs to be done
4. Consider potential resistance from community, neighbours, family, and others
    a. What problems might arise from doing these things?
    b. How might your neighbours react to you farming a different way? *(Are there cultural issues that may arise?)*
    c. What can you do to avoid problems and be prepared to face them when they arise?

REPORT BACK – *If there is more than one group, have each group share their plans. Ask the rest of the group if they have any more suggestions that can be added to their plan.*

Step 4: Act – Follow through on the Plan - 2 min

Once you have your Plan in place, you will need to do it. We will not have time to do this today, but let's read through the steps you will need to take to start your farming group.

1. Receive the necessary training OR implement a demo plot OR do whatever you have decided to do.
2. Put it into practice. You need to then try the proposed solution on your farm. Others can then learn through our example.
3. Support one another – Trying new things can be difficult. You will most likely have challenges. Don't give up! Encourage and support one another.

Step 5: Give God the Glory - 3 min

Remember, God created the heavens and the earth. He then planted a garden and gave it to us to take care of. As we now do our best to take care of the land, let us not forget to pray as we work and learn and then thank

God for what happens. Grateful hearts bring life to everyone. And remember to share this knowledge with others. To Him be all the glory!

Let's take time to thank God for His wonderful creation and how He has helped us learn to take care of it.

Facilitator: *Lead the group in a time of prayer of thanks or singing a song of praise for all of His creation and all the gifts of God in the community.*

Conclusion - 5 min

From the beginning of this module, we have been learning about God's creation and our role as caretakers of it. Let's review all of the main ideas as we close this time together.

Who can remember what each lesson focused on?

Lesson 1: All creation belongs to God. God has given it to us to take care of.
Lesson 2: People's role is to 'rule over' creation—to take care of it and use it for good, not to destroy it.
Lesson 3: God was the first farmer. Adam's first job was to be a farmer. Farming is a high calling from God. Work is a part of God's original plan and it gives us purpose and dignity.
Lesson 4: God can heal our land as we walk in obedience to Him.
Lesson 5: We feed the soil so that micro-organisms feed the plants.
Lesson 6: Plants need the right food (nutrients) at the right time or stage of their growth.
Lesson 7: A well-planned garden will provide healthy food for your family. to share with those in need and provide additional income.
Lesson 8: There are many natural ways to control pests and diseases. Don't give up, continue to try new things and share and encourage each other.
Lesson 9: God has provided many ways that we can strengthen our farms by using the resources we already have on the farm. As we implement these methods it causes the farm to produce more..
Lesson 10: Work together to identify problems and use what we have available to solve them. Give God the glory and share our success with others!

As we leave this training, our hope is that this church will:

Work with each other and the community to:

- Take care of the creation God has given to us,
- Share the knowledge and blessings from our farms with others, and
- Bring glory to God in our farming.