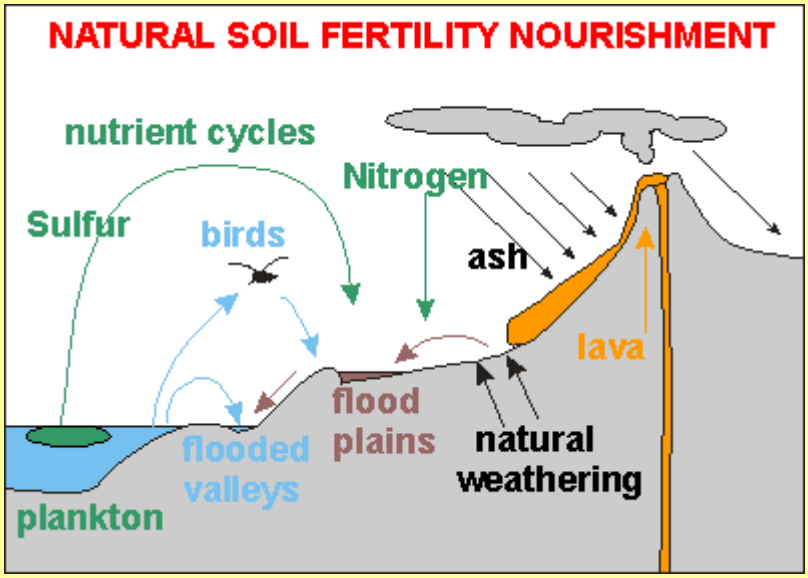
NQF Level: 1 **US No: 13355**

Facilitator Guide

Primary Agriculture

The environment and its relationship to sustainable crop production



My name: . . . . . .

Company: . . . . . .

Commodity: . . . . . Date: . . . . . .

The availability of this product is due to the financial support of the National Department of Agriculture and the AgriSETA.

agriculture
Department:
Agriculture
REPUBLIC OF SOUTH AFRICA

AgriSETA

Before you get started...

Dear Facilitator,

This Facilitator Guide (together with the relevant Learner Guide) is aimed at facilitators who will be assisting learners wishing to complete the following unit standard:

Title:	**Demonstrate an understanding of the physical and biological environment and its relationship to sustainable crop**				
US No:	**13355**	**NQF Level:**	1	**Credits:**	4

This guide contains all necessary facilitation instructions to ensure that learners will attain the expected competencies required by the above-mentioned unit standard. This guide is designed to be used during the presentation of a learning session based on this unit standard. The full unit standard is attached at the end of this guide as well as at the end of the relevant Learner Guide. Learners are advised to read the unit standard at their time. Please discuss the unit standard with the learners to ensure that they understand what is expected from them to achieve the outcomes of the unit standard.

This unit standard is one of the building blocks in the qualifications listed below. Please mark the qualification you are currently facilitating, because that will be determined by the context of application:

Title	ID Number	NQF Level	Credits	Mark
National Certificate in Animal Production	48970	1	120	❑
National Certificate in Mixed Farming Systems	48971	1	120	❑
National Certificate in Plant Production	48972	1	120	❑

Please mark the learning program the learners are enrolled in:

Are you facilitating a:	Y	N
Learnership?	❑	❑
Skills Program?	❑	❑
Short Course?	❑	❑

Please explain the above concepts to the learner.

Note to Facilitator:
If you are presenting this module as part of a full qualification or learnership, please ensure that you have familiarised yourself with the content of the qualification.

There are four guides, namely the Learner Guide, the Learner Workbook, the Assessor Guide and the Facilitator Guide. These guides have been developed to address specific aspects of the learning experience. You therefore need to use these guides additional each other.

Make this an enjoyable learning experience!

Context of Application ...

Primary Agriculture is a diverse sector and a wide range of commodities is being produced for both national and international market. Each commodity has its own production requirements and practices. You will be facilitating the learning process within a specific context where a specific agricultural commodity is being produced. The learning material has been written in a **generic** manner, as it is aimed to be available on national level and should be suitable to be applied within a variety of commodities. It is therefore inclusive of all agricultural commodities and crop in this field. Therefore, the examples that are being used in the materials may not always be applicable to your specific community, commodity, environment or region.

This presents you, the facilitator, with the challenge to **contextualise** the learning material. It is imperative that you, the Facilitator and Assessor interpret and present activities, case studies and projects related to the material in such a way that learners can easily identify and apply their knowledge within their own context. This will require from you to add examples of crop, which are applicable to the community or farm. Learners must be guided with examples from their own communities, commodities, environment or regions. This should be done supplementary to the learning material:

- Examples relevant to the commodity,
- Including commodity specific requirements,
- Including operating procedures of the farm,
- Including agricultural practice specific requirements,
- Agricultural markets,
- Guiding learners to write these specifities down in the learning guide, etc.

The contextualisation of the learning material is a very important step in preparing for and facilitating the learning experience and enough time and effort should be put into this exercise.

According to the qualifications mentioned on page 2, this module could be contextualised to fit the following groups of commodities:

Plant Production	Animal Production	
• Organic production, • Hydroponic production, • Perma-culture production, • Agronomy, • Horticulture, Natural resources harvesting.	• Small stock production, • Large stock production, • Dairy production, • Pig production, • Poultry production, • Game, • Aqua / mari culture, • Commercial insects • Animal fibres harvesting, • Bee keeping.	• Natural resources harvesting • Organic production, • Perma-culture production, • Eco/Agri Tourism, • Agro Chemicals, • Horse Breeding, etc.

How to use this guide …

Throughout the guide information is given specifically aimed at you, the facilitator, to **assist** in the actual presentation of the learning material and/or facilitation of the learning process. Although this guide contains all the information required for attaining competency in this unit standard, references to additional resources, both printed and electronic, are provided for additional reference by the facilitator and further study by the learner.

Please note that the purpose of this information is merely to **guide** you, the facilitator, and is provided as a suggestion of possibilities. It remains the responsibility of every facilitator to re-assess the learner/s in each learning situation throughout the learning process in order to stay in touch with their specific learning needs. This should be the determining factor in the choice of the learning approach to follow.

Use the different boxes listed below for identification purposes:

Instructions regarding **activities**, whether group or individual activities will be described in this box.

Facilitators' Tip …

My Notes …

You can use this box for your own notes/comments.

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

What & How will you be Facilitating?

My Notes ...

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

The Learning Experience...

When learners have achieved this unit standard, they will be able to:

- Identify and describe the nature of soil.
- Analyse soil as a factor in crop production.
- Identify and describe climatic factors influencing crop production and their practical implications
- Identify and describe the importance of water as a factor in crop production.
- Identify and describe the influence of topography on crop production.
- Identify, describe and explain the biological organisms as a factor influencing crop production.

Tips for level of learning

Remember the following before you get started:
This unit standard is aimed at level 1 learners.

- A typical level 1 learner might be exposed to the world of work through this learning program for the first time.
- Explain concepts and define words in a simple, clear and concise method throughout the learning program.
- Take special care to facilitate for ALL learners. Allow them opportunities to share experiences, prior knowledge, translate into their mother tongue for each other and enjoy the learning process.
- The examples given in this resource guide might be for a different geographical area or commodity to what the learner is exposed to – please adapt your examples accordingly.
- There should always be good communication between facilitators and mentors to ensure effective learning experience.
- During practical activities facilitators should be present at all times. Should that not be possible, the mentor should be available for attendance.

Learning Program Time Frames

	Total time allocated (hours)	Theoretical learning time allocated (hours)	Practical learning time allocated (hours)	Activities to be completed
Complete Program (including summative assessment)	40	12.17 hours	17.83 hours	15
Learner Orientation and "Ice Breaker"	0.66 (40 minutes)	0.33 (20 minutes)	0.33 (20 minutes)	N/a
Purpose, Introduction and Learner Directions	(minutes)	0.25 (15 minutes)	0.25 (30 minutes) 1: 30 minutes	1
Session 1	8 hours	2.5 hours	2: 30 minutes 3: 90 minutes 4: 120 minutes 5: 30 minutes 6: 60 minutes (5.5 hours)	2-6
Session 2	3.75 hours	2 hours	7: 60 minutes 8: 45 minutes (1.75 hours)	7-8
Session 3	3.5 hours	2 hours	9: 45 minutes 10: 45 minutes (1.5 hours)	9-10
Session 4	3.67 hours	1.67 hours	11: 60 minutes 12: 60 minutes (2 hours)	11-12
Session 5	5.67 hours	1.67 hours	13: 120 minutes 14: 120 minutes (4 hours)	13-14
Session 6	3.67 hours	1.67 hours	15: 120 minutes (2 hours)	15
Preparation for Assessment & revision	10 hours	N/a	N/a	N/a

Facilitator's Checklist & Training Aids

Learner support strategies
Learners are supplied with all resources and aids as required by the programme – including: • Objects & devices such as equipment, protective clothing, safety gear, etc. • Learner Guides and Learner Workbook • Visual aids, etc.

Use this checklist below during your preparation to ensure that you have all the equipment, documents and training aids for a successful session.

Preparation	Yes	No
Qualification Knowledge – I have familiarised myself with the content of the applicable qualification		
Unit Standard Knowledge – I have familiarised myself with the content of all aspects of the applicable unit standard		
Content Knowledge – I have sufficient knowledge of the content to enable me to facilitate with ease		
Application knowledge – I understand the programme matrix & have prepared for programme delivery accordingly		
Contextualisation – I have included information which is specific to the commodity and practices related to the commodity		
Ability to respond to learners background & experience – I have studied the learner demographics, age group, experience & circumstances & prepared for programme delivery accordingly		
Enthusiasm & Commitment – I am passionate about my subject & have prepared my programme delivery to create a motivating environment with real commitment to success		
Enterprise knowledge – I know & understand the values, ethics, vision & mission of the workplace & have prepared my programme delivery, reporting & administrative tasks accordingly.		
Documentation checklist:		
Attendance Register		
Course Evaluation		
Learner Course Evaluation		
Portfolios of evidence		

Equipment check:		
Learner guides x 1 per learner		
Assessment guides x 1 per learner		
Writing materials & stationary (facilitator & learner)		
White board & pens		
Flip chart paper		
Proxima projector & screen		
Laptop & programme disk		
Sample Hand-outs and examples of laws and other relevant documents		
Safety gear as prescribed by unit standard and applicable legislation		

Contextualisation of Content!

Go through this module and indicate what specific **information / activities / examples** should be included in this module.

Contextualisation	
What specific **information** / **activities** / **examples** should I include in this module?	
• Commodity specific?	
• Operating procedures of the farm?	
• Agricultural practices?	
• Agricultural markets?	

Session 1 Identify and describe the nature of soil

Learner Guide: Page 6

After completing this session, you should be able to:

SO 1: Identify and describe the nature of soil.

SO 2: Analyze soil as a factor in crop production.

Concept (SO 1)	Time frame	Activities related to the concept
The nature of soil.	30 minutes 2:30 minutes 120 minutes 30 minutes 60 minutes	1 – 6
Physical properties of soil		
The principle that soil is a product of its environment is described.		
Identify soil components are.		
Identify soil texture.		
Identify soil texture.		
Identify soil structure.		
Analyse soil as a factor in crop production.		
Factors affecting the role of soil in crop production.		
Explain soil productivity is.		
Factors that improve soil productivity and crop production.		
Identify soil limitations in crop production.		
Ways to overcome soil limitations in crop production.		
Analyse soil as a factor in crop production.		

Please allow learners to complete Activity 1-6 in their workbooks

Type of activity	Resources	Instructions to give to the learners	Conclusions
1. Brainstorm as a group	Learner Workbook, Learner Guide, Oral instruction.	This is group exercise. Read the activity instructions from the learner workbook out loud and allow learners an opportunity to make notes after each section.	Discuss why soil is important for our crop
2. Group activity: Write down key-ideas	Learner Workbook, Learner Guide, Oral instruction.	This is a group exercise. Read and discuss the activity and make notes about what you know about soil	Make notes about what you might already know about soil.
3. Collect samples and write down your observations	Learner Workbook, Learner Guide, Oral instruction.	This is group exercise. Use three different pieces of sticky tape and stick your sample in your workbook.	Describe next to each sample how they "feel".
4. As a group – Observe and apply	Learner Workbook, Learner Guide, Oral instruction and planting area.	This is group exercise. Use three different pieces of sticky tape and stick the samples in your workbook. Record the findings.	Discuss what you have observed and how you went about the procedures.
5. As a group – look at the picture provided with this activity.	Learner Workbook, Learner Guide, Oral instruction.	This is group exercise. Prepare a 2 minute group presentation on how you think the soil cycle works.	Record key-concepts on soil cycle.
6. As a group – observe and apply	Learner Workbook, Learner Guide, Oral instruction and planting area.	Decide what consistency your soil has, and make observations as to whether there are roots and rocks present.	Write down your observations what needs to be done to prepare soil.

Facilitators' Tip ...

- Allow time for learners to find out what they already know about soil & its importance. This will help you understand possible problems or difficulties that the learners might have at a later stage.
- Allow learners to "feel" and "smell" different soil samples and say how they differ.
- Allow time for learners to take their own samples & arrange for a venue to this.
- Emphasize that learners must concentrate on the variations between each other's samples and between their own samples at different depths.
- This is a much more "accurate" soil sampling exercise. It is strongly recommended that as facilitator you get "down and dirty" with the learners while doing this activity. Dig as many profile holes as possible and alert learners to the differences in appearance of the different soils.
- Before allowing learners to break away to complete the activity, pose the phrase: "ashes to ashes, dust to dust" to trigger some thoughts in the learners' minds.
- Explore different soil consistencies with the learners ask how they think they'd like to grow in such soil if they were a specific plant. Then explore soil preparation techniques with the learners and remember to also include the hand preparation methods.

My Notes ...

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

Session 2 Climatic factors that influence crop production

Learner Guide: Page 23

After completing this session, you should be able to:
SO 3: Identify and describe climatic factors that influence crop production and explore their practical implications.

Concept (SO 3)	Time frame	Activities related to the concept
Identify and describe climatic factors influencing crop production and their practical implications	60 minutes 45 minutes	7 – 8
Climatic factors influencing crop production are identified.		
Climatic factors influencing crop production are described.		
The influence of climatic factors on crop production is explained.		
Crop production practices that can be adapted to climatic factors are investigated and reported.		

Please allow learners to complete Activity 7 in their workbooks

Type of activity	Resources	Instructions to give to the learners	Conclusions
7. Think about "the climate" in your area.	Record your answers in your learner workbook	Describe it to the rest of the class.	Make key notes as a reminder to yourself.

Please allow learners to complete Activity 8 in their workbooks

Type of activity	Resources	Instructions to give to the learners	Conclusions
8. Research and discover What kinds of crops are grown as animal feed.	Record your answers in your learner workbook	Now go and read about a crop like "apples" or "grapes" – Does this kind of crop need a "specific" kind of climate to grow?	Explain what kinds of climatic conditions are needed by the different kinds of crops.

Facilitators' Tip ...

- It is important to differentiate between weather & climate & have learners give ideas of their area's weather vs. climate.
- Learners should be familiar with crops eaten by domestic animals. Also suggest some alternatives to those found in their area. Use examples of animals the learners are familiar with and also some they are not familiar with.

My Notes ...

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

Session 3 Importance of water in crop production

Learner Guide:
Page 28

After completing this session, you should be able to:
SO 4: Identify and describe the importance of water as a factor in crop production.

Concept (SO 4)	Time frame	Activities related to the concept
Identify and describe the importance of water as a factor in crop production. Sources of water are identified. The role of water in crop production is explained. The principle of water as a finite resource in crop production is explained. The optimal use of water resources in crop production is explained. Conclusions regarding the significance of water in crop production are drawn.	45 minutes	9 & 10

Please allow learners to complete Activity 9 and 10 in their workbooks

Type of activity	Resources	Instructions to give to the learners	Conclusions
9. Research and discover	Record your answers in your learner workbook	In your group - Make a list water sources and say whether each one would be sufficient to grow crops for commercial farming purposes.	Identify types of water sources
10. Observe and discover	Record your answers in your learner workbook	In your group – walk around and make a list of all the possible irrigation methods in which you see people applying water to their crops for irrigation purposes.	Identify irrigation methods used in your area

Facilitators' Tip ...

- Water sources include source water, boreholes, dams, lakes, rivers, canals, fountains & springs.
- Sufficiency of source depends on crop requirement and volumes of water available; water sources could also be subject to environmental legislation in terms of volume available and suitability for crop production.
- Most learners would be familiar to plants being watered. Ensure that as many examples are given as possible.

My Notes ...

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

Session 4 The influence of topography on crop production.

Learner Guide: Page 33

After completing this session, you should be able to:
SO 5: Identify and describe the influence of topography on crop production.

Concept (SO 5)	Time frame	Activities related to the concept
Land use & suitability for crop production Topography is defined and explained Topography as a factor influencing crop production is explained Topography as a factor influencing crop production practices is evaluated Practices for overcoming topographical limitations to crop production are investigated and reported	60 minutes	11
Overcoming topographical problems	60 minutes	12

Please allow learners to complete Activity 11 and 12 in their workbooks

Type of activity	Resources	Instructions to give to the learners	Conclusions
11. Observe and discover	**Record your answers in your learner workbook**	Walk around along a flat piece of land and rate it out of a scale of 1 – 10 Walk up a steep hill and rate the area in the same way out of 10.	Find possible problems that you might find in trying to cultivate a land with a steep slope

Please allow learners to complete Activity 11 and 12 in their workbooks

Type of activity	Resources	Instructions to give to the learners	Conclusions
12. Observe and discover	**Record your answers in your learner workbook**	Brain storm possible ideas and solutions for overcoming unfavourable topographical conditions to plant grazing.	Find possible ideas and solutions for overcoming unfavourable topographical conditions to plant grazing.

Facilitators' Tip ...

- Spend extra time on suitability of land for crop production and the consequences of not planting accordingly.
- This activity follows directly after Activity 11 and can be answered while exploring different sites.
- At the end of the session, allow time for learners to share personal experience
- Encourage learners to ask question regarding concepts that they need clarity on
- Allow time for revision and summarising of concepts covered in this session

My Notes ...

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

Session 5 Biological organisms which influence crop production.

Learner Guide: Page 38

After completing this session, you should be able to:
SO 6: Identify, describe and explain the biological organisms as a factor influencing crop production.

Concept (SO 6)	Time frame	Activities related to the concept
Harmful organisms for crops The harmful effects of micro-organisms in crop production are identified and described. Control options of harmful micro-organisms in crop production are identified and described. The harmful effects of invertebrates on crop production are identified and described	120 minutes	13
Beneficial Insects for crops The beneficial effects of micro-organisms on crop production are identified and described. The beneficial effects of invertebrates in crop production are identified and described Control options for invertebrates in crop production are identified and described. Weeds as a limiting factor in crop production is explained. Control options for weeds in crop production are discussed.	120 minutes	14

Please allow learners to complete Activity 13 and 14 in their workbooks

Type of activity	Resources	Instructions to give to the learners	Conclusions
Activity 13. In groups observe and discover	Record your answers in your learner workbook	Draw a poster of the possible micro-organisms and insects that might harm your crop.	The impact of poor management.
Activity 14. In groups observe and discover	Record your answers in your learner workbook	Go to a library and find out about "beneficial" insects in farming.	The benefits "beneficial" insects has to farming.

Facilitators' Tip ...

- Allow learners time to research literature for this activity.
- Learners have often not thought of insects as beneficial.
- Use the example of the bee as pollinator to explain how insects can be beneficial.
- Give learners time to break away in groups & encourage creative posters that are not copies of each other's answers.
- Learners might struggle with distinguishing between "micro-organisms" and 'insects"-explain the difference before they start doing their research and poster.
- If possible, supply some literature and examples.

My Notes ...

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

Session 6 Assess the effects of crop production

Learner Guide:
Page 48

After completing this session, you should be able to:
SO 7: Assess the effects of crop production practices on the sustainability of the environment.

Concept (SO 7)	Time frame	Activities related to the concept
Assess the effects of crop production practices on the sustainability of the environment.	120 minutes	15
The concept of sustainability is explained and defined.		
Existing crop production practices are identified.		
Crop production practices that enhance agricultural sustainability are identified and explained.		
Crop production practices that have a negative impact on the sustainability of the environment are identified and explained.		

Please allow learners to complete Activity 15 in their workbooks

Type of activity	Resources	Instructions to give to the learners	Conclusions
15. In groups observe and discover	Record your answers in your learner workbook	Draw a mind map – What would happen if we did not care for the environment and we did not farm sustainably?	The impact of poor farm management

Facilitators' Tip ...

- Sustainability is a very important concept to level one learners!
- Spend extra time explaining what it means and how to accomplish it.
- Encourage learner participation to solve sustainability issues and come up with their own reasons for the importance of sustainability in their communities and the farms where they work.

What will I do differently next time?

Take some time to **reflect** on your own activities as facilitator of this Unit Standard. Then write down five of the most important lessons you have learnt and include a motivation:

What will I do differently next time?	Motivate how or why (Give examples, reasons, etc.)
1.	
2.	
3.	
4.	
5.	

As facilitator, you have hands on experience in the application of the unit standard. And you might experience difficulties with the unit standard that the developers did not anticipate. Also, the unit standard will be revised at the end of the registration period. Your comments below can be an important contribution in the revision process and should be brought to the attention of either the AgriSETA ETQA manager or the SGB chairperson.

Please take some time to reflect on your experience and list a few of the difficulties you had to address.

Difficulties I had with the Unit Standard	Recommended Changes to Address the Difficulty
6.	
7.	
8.	
9.	
10.	