



NQF Level: 4

US No: 116317

Facilitator Guide

Primary Agriculture

Installation and Management of an Irrigation System



Facilitator:

Company:

Commodity: Date:

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agriculture

Department:
Agriculture
REPUBLIC OF SOUTH AFRICA



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: Installation and Management of Irrigation Systems
US No: 116317 NQF Level: 4 Credits: 3

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 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	48979	4	120	<input type="checkbox"/>
National Certificate in Plant Production	49009	4	120	<input type="checkbox"/>

Please mark the learning program the learners are enrolled in:

Are you enrolled in a:	Y	N
Learnership?	<input type="checkbox"/>	<input type="checkbox"/>
Skills Program?	<input type="checkbox"/>	<input type="checkbox"/>
Short Course?	<input type="checkbox"/>	<input type="checkbox"/>

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.

Please explain the above concepts to the learner.

There are three guides, namely the Learner Guide (with activities), 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 complementally to one another.

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 relevant 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 by complementing the learning material with:

- 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 specifics 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	
<ul style="list-style-type: none"> • Organic production, • Hydroponic production, • Perma-culture production, • Agronomy, • Horticulture, • Natural resources harvesting. 	<ul style="list-style-type: none"> • Small stock production, • Large stock production, • Dairy production, • Pig production, • Poultry production, • Game, • Aqua / mari culture, • Commercial insects • Animal fibres harvesting, • Bee keeping, 	<ul style="list-style-type: none"> • 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.

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What & How will you be Facilitating?

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The Learning Experience...

On completion of this module, the learners will be able to:

- ◆ Effectively supervise the installation, operation and maintenance of irrigation systems of agricultural crops.
- ◆ Learners will gain specific knowledge and skills in irrigation and will be able to operate in a plant production environment implementing sustainable and economically viable production principles.
- ◆ They will be capacitated to gain access to the mainstream agricultural sector in plant production, impacting directly on the sustainability of the sub-sector. The improvement in production technology will also have a direct impact on the improvement of agricultural productivity of the sector.

Learning Assumed to be in Place:

- ◆ NQF 3: Literacy and Numeracy
- ◆ NQF 3: 116266, Monitor the operation and maintenance of irrigation systems
- ◆ NQF 4: 116290, Establish a plan for the monitoring, safe use and maintenance of equipment, implements, technology and infrastructure



Remember to do a diagnostic assessment of the learner's prior learning and ensure that they are starting at the correct level.

My Notes ...

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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)	30 hours	8 hours 30 minutes	22 hours 30 minutes	10
Learner Orientation and "Ice Breaker"	30 minutes	15 minutes	15 minutes	n/a
Purpose, Introduction and Learner Directions	30 minutes	15 minutes	15 minutes	n/a
Session 1	1 hour	30 minutes	30 minutes	1-3
Session 2	15 hours	2 hours	3 hours activities 10 hours work in the irrigation section of a farm	4-5
Session 3	3 hours	1 hour	2 hours	6-8
Session 4	6 hours	2 hours	4 hours	9-10
Preparation for Assessment and revision	4 hours	1 hour 30 minutes	2 hours 30 minutes	n/a

My Notes ...

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Tips for level of learning



Remember the following before you get started:

Typically, a learning programme leading to the award of a qualification or unit standards at level 4 should develop learners who demonstrate an ability to:-

- Take responsibility for their own learning within a supervised environment.
- Take decisions about and responsibility for actions.
- Evaluate their own performance against given criteria.
- Take the initiative to address any shortcomings they find.
- Communicate and present information reliably and accurately in writing and verbally.
- Gather relevant information, analysis and evaluation skills.
- Use their knowledge to solve common problems within a familiar context; adjust an application of a common solution within relevant parameters to meet the needs of small changes in the problem or operating context; motivate the change using relevant evidence.
- Apply essential methods, procedures and techniques of the field or discipline; apply and carry out actions by interpreting information from text and operational symbols or representations.
- Understand the organisation or operating environment as a system within a wider context.
- Demonstrate a fundamental knowledge base of the most important areas of one or more fields or disciplines, in addition to the fundamental areas of study an informed understanding of the key terms, rules, concepts, established principles and theories in one or more fields or disciplines.

Tips for the Facilitator



- This checklist has been designed to assist you in delivering the best possible facilitation to the learners.
- Please use it and supply whatever resources you might have in short supply at your venue of learning.

My Notes ...

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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.		
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		
Documentation checklist:		
Attendance Register		
Course Evaluation		
Learner Course Evaluation		
Portfolios of evidence		

Contextualisation of Content!

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

Contextualisation	
<ul style="list-style-type: none"> ▪ Commodity specific? 	
<ul style="list-style-type: none"> ▪ Operating procedures of the farm? 	
<ul style="list-style-type: none"> ▪ Agricultural practices? 	
<ul style="list-style-type: none"> ▪ Agricultural markets? 	

Session

1

Install an Irrigation System

**Learner
Guide:
Page 12**

After completing this session, the learner should be able to:
SO 1: Install an Irrigation System.

Concept (SO 1)	Time frame	Activities related to the concept
Irrigation design plan is interpreted.	1 hour	Activity 1 - 3
Irrigation system is pegged out according to specification.		
Conveyance system trenches are dug according to specifications.		
Irrigation pipes, valves, filters, etc. are installed according to specifications.		
Irrigation system is tested and evaluated according to standard procedures.		
Trenches are back-filled according to specification.		



Please allow learners to complete Activity 1 - 3 in their Learner Guides

Type of activity	Resources
1. Group Activity	Learner Guide, stationary.
Instructions to give to the learners	
As per instructions in Learner Guide.	
Type of activity	Resources
2. Group Activity	Learner Guide, stationary.
Instructions to give to the learners	
As per instructions in Learner Guide.	
Type of activity	Resources
3. Group Activity	Learner Guide, stationary.
Instructions to give to the learners	
As per instructions in Learner Guide.	

Tips for the Facilitator



- **Activity 1**
- Allow time for learners to work through this irrigation design plan as groups and discuss the plan together. Each learner must then complete the worksheet individually.
- Where possible, learners should simulate laying out an irrigation system. It can be done by marking out an area on the floor and marking the floor with e.g. chalk and describing how and where to dig trenches, lay pies, etc. This can also be simulated or demonstrated in the orchard if time allows.
- Where possible, pay a site visit where trenches are being dug or where they have been dug to show the dimensions and depth, as well as the methodology that is used.
- Where possible, pay a site visit or show video footage of the different equipment being installed. Pay special attention to specifications, diameters, and depths of installation.
- Pose the following question to different groups: "How will you test a newly installed irrigation system?" Allow feedback from the different groups before facilitating this section.
- Allow time for the learners to read through the summary and to gauge their own progress. Make sure that each and every learner gets an opportunity to ask questions.
- **Activity 2**
- Remind learners that they have to spend at least 10 practical hours completing the listed tasks and to request signatures from their SME's to be completed to confirm completion of these duties. Time has been allowed for learners to gather signatures and dates.
- **Activity 3**
- Allow time for learners to complete the worksheet. Remind learners to base their answers on their practical experience where possible.

My Notes ...

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Session

2 Maintenance and evaluation of an irrigation system

**Learner Guide:
Page 30**

After completing this session, the learner should be able to:
SO 2 : Maintain and evaluate an irrigation system

Concept (SO 2)	Time frame	Activities related to the concept
Pre-season maintenance is carried out.	15 hours	Activity 4 - 5
In-season maintenance is carried out.		
Post-season maintenance is carried out.		
Regular evaluation of the functioning of an irrigation system as per design specifications.		



Please allow learners to complete Activity 4 - 5 in their Learner Guides

Type of activity	Resources
4. Group Activity	Learner Guide, stationary.
Instructions to give to the learners	
As per instructions in Learner Guide.	
Type of activity	Resources
5. Individual Activity	Learner Guide, stationary.
Instructions to give to the learners	
As per instructions in Learner Guide.	

My Notes ...

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Tips for the Facilitator



- The maintenance tasks performed on an irrigation system is best demonstrated by walking the irrigation system on an irrigation farm and identifying the different maintenance points, how it should be maintained and how often maintenance tasks are performed. This will ensure that learners recognise the different parts and understand how irrigation systems link together and will also ensure that they remember what can go wrong, how to fix it and when to fix it. If an SME is available, arrange for this person to accompany the group. Encourage questions and open discussions from the learners.
- Where tests have to be performed, such as the CU test and pressure checks, demonstrate it. Where adjustments are required, show the methods of adjusting if permission can be obtained.
- Allow time for the learners to read through the summary and to gauge their own progress. Make sure that each and every learner gets and opportunity to ask questions.
- **Activity 4**
- Remind learners to place themselves in the position of a manager issuing duties to other workers. Encourage learners to base their answers on their personal practical experience and to remember to list duties in simple language and with as much detail as possible to prevent confusion or incorrect actions.
- **Activity 5**
- This is an opportunity for learners to check their progress to date and to apply the knowledge that they have gained so far. Encourage own work, and own interpretation.

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3 Operating an Irrigation System

Session

**Learner
Guide:
Page 38**

After completing this session, the learner should be able to:

SO 3: Efficiently operate an irrigation system

Concept (SO 2)	Time frame	Activities related to the concept
Schedule is given to and discussed with the field/orchard operator.	3 hours	Activity 6 - 8
Irrigation is monitored according to irrigation schedule.		
Irrigation effectiveness is determined.		



Please allow learners to complete Activity 6 - 8 in their Learner Guides

Type of activity	Resources
6. Individual Activity.	Learner Guide, stationary.
Instructions to give to the learners	
As per instructions in Learner Guide.	
Type of activity	Resources
7. Individual Exercise.	Learner Guide, stationary.
Instructions to give to the learners	
As per instructions in Learner Guide.	
Type of activity	Resources
8. Individual Exercise.	Learner Guide, stationary.
Instructions to give to the learners	
As per instructions in Learner Guide.	

My Notes ...

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Tips for the Facilitator



- Although most learners would have encountered irrigation schedule, few will have encountered the actual methodology behind how the schedule is compiled or understand what the consequences are of not following the schedule correctly.
- If possible, prepare an experiment about 10 days prior to the facilitation in which you have a control plant in a pot, receiving the correct water regimes and one that has not been "irrigated" at all. Show the physical evidence of what happens if the plant is not watered.
- Where possible, show the equipment used in irrigation scheduling and explain the role of computer-based systems in irrigation scheduling.
- **Activity 6**
- Allow time for learners to answer the activity individually. Encourage own words and own interpretation.
- Where possible and if time allows, show monitoring equipment in practice.
- If time and access permits, demonstrate the methods described in this section in practice.
- This is an opportunity to check the progress that learners have made.
- Allow time for the learners to read through the summary and to gauge their own progress. Make sure that each and every learner gets an opportunity to ask questions.
- **Activity 7**
- Remind learners to base their report on their practical experience and to complete the report individually.
- **Activity 8**
- Remind learners of the requirements of a pictogram. Then allow time for each learner to complete their own pictogram.

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4 Collating data for Management of an Irrigation System

Session

Learner Guide:
Page 43

After completing this session, the learner should be able to:

SO 4: Collate data pertaining to the long-term efficient management of an irrigation system.

Concept (SO 2)	Time frame	Activities related to the concept
Record all relevant water use/crop yield/climatic data for later evaluation and adaptation (of, for instance, scheduling practices, if required).	6 hours	Activity 9 - 10
Recording of all relevant data in a recognised electronic format.		
Regular updating of all records to comply with new generation electronic hardware/software.		
On-going, low-key, checking/evaluation of all data to ensure validity of, especially, electronically collated data.		
Preparation of reports for supervisor evaluation.		



Please allow learners to complete Activity 9 - 10 in their Learner Guides

Type of activity	Resources
9. Individual Activity.	Learner Guide, stationary.
Instructions to give to the learners	
As per instructions in Learner Guide.	
Type of activity	Resources
10. Individual Exercise.	Learner Guide, stationary.
Instructions to give to the learners	
As per instructions in Learner Guide.	

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.	