MANAGE SOIL AND WATER RESOURCES

UNIT CODE: AGR/OS/EXT/CR/02/6/A

UNIT DESCRIPTION

This unit specifies competencies required to manage soil and water resources.

It involves assessment of area topography, conserve soil fertility, conserve farm water, Design soil and water conservation structures, lay out soil and water structures, carry out farm irrigation, carry out farm water drainage, harvest farm water, manage waste water disposal, manage water supply and prepare soil and water resources management report.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function.	**PERFORMANCE CRITERIA** These are assessable statements which specify the required level of performance for each of the elements. ***Bold and italicized terms are elaborated in the Range.***
1. Assess area topography	1.1 Area topography to be assessed is mapped out according to guidelines stipulated in soil and water conservation manual. 1.2 Area topography is assessed in accordance to soil and water conservation manual 1.3 Assessed area topography is documented as per soil and water conservation manual 1.4 Area topography is assessed for land use viability according to soil and water conservation manual.
2. Conserve soil fertility	2.1 Soil is sampled for fertility testing following the procedures as per soil conservation handbook. 2.2 Soil is tested for nutrients element as per soil laboratory manual. 2.3 Soil tests results are recorded as per soil laboratory manual. 2.4 Soil fertility is improved through organic farming as per organic farming manual. 2.5 Soil fertility improvements recommendations are given as per soil laboratory manual.
3. Conserve farm water	3.1 Farm ***water sources*** are identified as per soil and water conservation manual 3.2 Farm water conservation methods are identified as per soil and water conservation manual. 3.3 Farm water conservation structures are constructed as per soil and conservation manual 3.4 Conserved farm water is taken care of to minimize wastage as per soil and water conservation handbook
4. Design soil and water	4.1 soil and water conservation structures are identified as per soil and water manual

conservation structures	4.2 Soil and water conservation structures are designed as specified in soil and water conservation manual
5. Lay out soil and water structures	5.1 Area layout is established as per soil and water conservation manual 5.2 Established area is pegged as per soil and water conservation manual 5.3 Pegged area is measured as per size and type of structure to be constructed 5.4 Area is excavated as per structure design 5.5 Soil and water structures are maintained as per good agricultural practices.
6. Carry out farm irrigation	6.1 Irrigation methods are identified as per soil and water conservation manual 6.2 Identified irrigation methods are carried out as per soil and water conservation manual
7. Carry out farm water drainage	7.1 Farm drainage systems are identified as per farm plan 7.2 Water drainage systems are constructed as per farm plan 7.3 Water drainage system is maintained as per environmental management plan
8. Harvest farm water	8.1 Farm water harvesting methods are identified as per soil and water conservation manual 8.2 Water harvesting structures are constructed as per soil and water conservation manual 8.3 Water harvesting structures are maintained as per environmental management plan
9. Manage waste water disposal	9.1 Waste water disposal methods are identified as per waste water management manual 9.2 Waste water disposal structures are identified as per waste water management manual 9.3 Waste water management structures are constructed as per waste water management manual
10. Manage water supply	10.1 Sources of water are identified as per water supply and maintenance manual 10.2 water supply methods are identified as per water supply and maintenance manual 10.3 water supply systems are installed as per water supply and maintenance manual
11. Prepare soil and water resources	11.1 Data on soil and water resources is collected as per user needs 11.2 Data on soil and water resources is analyzed as per standard data analysis tools

	management report	11.3 Data analysis result are recorded

RANGE OF VARIABLES

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

RANGE	VARIABLE
1. Water sources may include but not limited to:	• Wells • Springs • Rain water • Dams • Rivers • Lakes etc.
2. Water conservation methods may include but not limited to:	• Roof catchment • road runoff • rock catchment
3. Water conservation structures may include but not limited to:	• Dams • Water tanks • Wells • Water pans • Cutoff drains • Gulley control

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Mapping
- Documentation
- handling soil fertility testing equipment
- Collecting soil samples
- Performing simple soil testing
- Composting
- Manure and fertilizer application

- Conserving water
- Construction water conservation structures
- Designing
- laying
- Installation
- Construction of drainage systems
- Construction of waste water disposal structures
- Waste water re-cycling
- reporting
- Measuring

Required knowledge

The individual needs to demonstrate knowledge of:

- Assessment
- Mapping
- Documentation -procedures
- Land use categories
- Knowledge on organic farming
- Handling soil sampling equipment.
- Soil testing methods
- Soil properties
- Soil science
- Soli nutrients
- Manure and fertilizer application
- Sources of water
- Conservation methods
- Conservation structures
- Construction of water conservation structures
- Water use
- Water conservation structures
- Design water conservation structures
- Laying out of soil and water conservation structure
- Irrigation methods
- Installation of irrigation structures
- Types of drainage systems
- Construction of drainage systems
- Water harvesting methods
- Construction of water harvesting structures
- waste water disposal methods
- Waste water disposal structures
- Construction of waste water disposal structures
- Sources of water

- Water supply methods
- Installation of water supply systems
- Report writing

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical aspects of competency	Assessment requires evidence that the candidate: Demonstrated: 1.1 Ability to assess area topography 1.2 Understanding of soil nutrients 1.3 Ability to calculate fertilizer requirements 1.4 Ability to test soil fertility 1.5 Understanding of farm water sources 1.6 Understanding of water conservation methods 1.7 Ability to design and construct farm water structures 1.8 Ability to lay out soil and water conservation structures 1.9 Understanding of irrigation methods 1.10 Ability to irrigate farm 1.11 Understanding of drainage systems 1.12 Ability to carry water drainage 1.13 Ability to harvest farm water 1.14 Ability Manage waste water disposal 1.15 Ability to Manage water supply 1.16 Ability to prepare soil and water resources management report
2. Resource implication	The following resources should be provided: 2.1 Materials, tools and equipment 2.2 Assessment location
3. Method of assessment	Competency in this unit may be assessed through: 3.1 Projects 3.2 Observation 3.3 Written tests 3.4 Questionnaires 3.5 Oral questioning
4. Context of assessment	4.1 Competency elements must be assessed in a safe working environment 4.2 Assessment may be conducted in a workplace or simulated environment 4.3 During industrial attachment
5. Guidance	Holistic assessment with other units relevant to the industry sector,

	information for assessment	workplace and job role is recommended.