****

**REPUBLIC OF KENYA**

**COMPETENCY BASED CURRICULUM**

**FOR**

**SUSTAINABLE AGRICULTURE FOR RURAL DEVELOPMENT**

**LEVEL 5**



TVET CDACC

P.O. BOX 15745-00100

NAIROBI

First published 2019

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# FOREWORD

The provision of quality education and training is fundamental to the Government’s overall strategy for social economic development. Quality education and training will contribute to achievement of Kenya’s development blueprint and sustainable development goals.

Reforms in the education sector are necessary for the achievement of Kenya Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the Constitution and this resulted to the formulation of the Policy Framework for Reforming Education and Training. A key feature of this policy is the radical change in the design and delivery of TVET training. This policy document requires that training in TVET be competency based, curriculum development be industry led, certification be based on demonstration of competence and mode of delivery allows for multiple entry and exit in TVET programmes.

These reforms demand that Industry takes a leading role in curriculum development to ensure the curriculum addresses its competence needs. It is against this background that this curriculum has been developed.

It is my conviction that this curriculum will play a great role towards development of competent human resource for the Agriculture Sector’s growth and development.

**PRINCIPAL SECRETARY**

**VOCATIONAL AND TECHNICAL TRAINING**

**MINISTRY OF EDUCATION**

# PREFACE

Kenya Vision 2030 aims to transform the country into a newly industrializing, “middle-income country providing a high-quality life to all its citizens by the year 2030”. Kenya intends to create a globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy through life-long education and training. TVET has a responsibility of facilitating the process of inculcating knowledge, skills and attitudes necessary for catapulting the nation to a globally competitive country, hence the paradigm shift to embrace Competency Based Education and Training (CBET).

The Technical and Vocational Education and Training Act No. 29 of 2013 on Reforming Education and Training in Kenya, emphasized the need to reform curriculum development, assessment and certification. This called for a shift to CBET to address the mismatch between skills acquired through training and skills needed by industry as well as increase the global competitiveness of Kenyan labour force.

TVET Curriculum Development, Assessment and Certification Council (TVET CDACC) in conjunction with Agriculture Sector Skills Advisory Committee (SSAC) and Ministry of livestock have developed this curriculum.

This curriculum has been developed following the CBET framework policy; the CBETA standards and guidelines provided by the TVET Authority and the Kenya National Qualification Framework designed by the Kenya National Qualification Authority.

This curriculum is designed and organized with an outline of learning outcomes; suggested delivery methods, training/learning resources and methods of assessing the trainee’s achievement. The curriculum is competency-based and allows multiple entry and exit to the course.

I am grateful to the Council Members, Council Secretariat, and Agriculture SSAC members, expert workers and all those who participated in the development of this curriculum.

**CHAIRMAN**

**TVET CDACC**

**ACKNOWLEDGMENT**

This curriculum has been designed for competency-based training and has independent units of learning that allow the trainee flexibility in entry and exit. In developing the curriculum, significant involvement and support was received from various organizations.

I recognize with appreciation the role of Agriculture Sector Skills Advisory Committee (SSAC) in ensuring that competencies required by the industry are addressed in the curriculum. I also thank all stakeholders in the Sustainable Agriculture for Rural Development sector for their valuable input and all those who participated in the process of developing this curriculum.

I am convinced that this curriculum will go a long way in ensuring that workers in Sustainable Agriculture for Rural Development Sector acquire competencies that will enable them to perform their work more efficiently.

**COUNCIL SECRETARY/CEO**

**TVET CDACC**

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# ABBREVIATIONS AND **ACRONYMS**

ASALs Arid and semi-arid lands

BC Basic Competency

CC Common Units

CDACC Curriculum Development Assessment and Certification Council

CMT California Mastitis Test

CR Core Competency

CU Curriculum

EMCA Environmental management and Conservation Authority

GAP Good Agricultural Practices

GMA Gross margin analysis

ICT Information communication technology

IPM Integrated Pest Management

KCSE Kenya Certificate of Secondary Education

KNQA Kenya National Qualifications Authority

LPM Livestock production manual

MDGs Millennium Development Goals

MoALF Ministry of Agriculture Livestock and Fisheries

OSHA Occupation Safety and Health Act

PESTEL Political economic social technological environmental l

PPE Personal Protective Equipment

SARD Sustainable Agriculture for Rural Development

SDGs Sustainable Development Goals

SSAC Sector Skills Advisory Committee

SWOT Strength weaknesses opportunities and threats

TVET Technical and Vocational Education and Training

# KEY TO UNIT CODE

 **AGR / CU/SARD/ BC/01/ 5/A**

Industry or sector

Curriculum

Occupational area

Type of competency

Competency number

Competence level

Version control

# COURSE OVERVIEW

**Description of the Course**

The Sustainable Agriculture for Rural Development level Five (5) qualification consists of units of learning that a trainee must achieve to manage crop production, manage animal production, demonstrate knowledge of organic farming, manage agroforestry activities, process farm produce, conduct SARD community development and manage SARD projects.

**Units of Learning**

The units of learning comprising sustainable agriculture for rural development practitionerlevel 5 qualification include the following:

**Basic Units of Learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in Hours** | **Credit Factor** |
|  GR/CU/SARD/BC/01/5/A | Communication Skills | 25 | 2.5 |
|  GR/CU/SARD/BC/02/5/A | Numeracy Skills | 40 | 4 |
|  GR/CU/SARD/BC/03/5/A | Digital Literacy | 45 | 4.5 |
|  GR/CU/SARD/BC/04/5/A | Entrepreneurial Skills | 70 | 7 |
|  GR/CU/SARD/BC/05/5/A | Employability Skills | 50 | 5 |
|  GR/CU/SARD/BC/06/5/A | Environmental Literacy | 25 | 2.5 |
|  AGR/CU/SARD/BC/07/5/A | Occupational Safety and Health Practices | 25 | 2.5 |
| **Total**  |  | **280** | **28** |

**Common Units of Learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in Hours** | **Credit Factor** |
| AGR/CU/SARD/CC/01/5/A | Science for SARD | 40 | 4 |
| AGR/CU/SARD/CC/02/5/A | Principles of SARD  | 120 | 12 |
| AGR/CU/SARD/CC/03/5/A | Principles of Agricultural Engineering  | 120 | 12 |
| AGR/CU/SARD/CC/04/5/A | Farm Business Management | 80 | 8 |
| AGR/CU/SARD/CC/05/5/A | Climate Change Resilience Practices | 50 | 5 |
| AGR/CU/SARD/CC/06/5/A | Management of Farm Chemical use for SARD | 50 | 5 |
| **Total**  |  | **460** | **46** |

**Core Units of Learning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit Code** | **Unit Title** | **Duration in Hours** | **Credit Factor** |
| AGR/CU/SARD/CR/01/5/A | Crop Production Management | 360 | 36 |
| AGR/CU/SARD/CR/02/5/A | Animal Production Management  | 250 | 25 |
| AGR/CU/SARD/CR/03/5/A | Organic Farming | 60 | 6 |
| AGR/CU/SARD/CR/04/5/A | Agroforestry  | 60 | 6 |
| AGR/CU/SARD/CR/05/5/A | Farm Produce Processing | 130 | 13 |
| AGR/CU/SARD/CR/06/5/A | SARD Community Development | 120 | 12 |
| AGR/CU/SARD/CR/07/5/A | Management of SARD Projects | 40 | 4 |
| AGR/CU/SARD/CR/08/5/A | Industrial attachment  | 360 | 36 |
| Total |  | **1380** | **138** |
| **Grand Total**  |  | **2120** | **2120** |

**Entry Requirements**

An individual entering this course should have any of the following minimum requirements:

1. Kenya Certificate of Secondary Education (KCSE D)

**Or**

1. Certificate in Agriculture Level 4

 **Or**

1. Equivalent qualifications as determined by Kenya National Qualifications Authority (KNQA)

**Trainer Qualification**

A trainer for this course should have a higher qualification than Level 5.

**Assessment**

The course will be assessed at two levels: internally and externally. Internal assessment is continuous and is conducted by the trainer who is monitored by an accredited internal verifier while external assessment is the responsibility of TVET CDACC.

**Certification**

A candidate will be issued with a Certificate of Competency on demonstration of competence in a Unit of Competency. To attain the National **Sustainable** Agriculture for Rural Development Certificate Level 5, the candidate must demonstrate competence in all the Units of Competency as given in qualification pack. These certificates will be issued by TVET CDACC in conjunction with training provider.

# BASIC UNITS OF LEARNING

# COMMUNICATION SKILLS

**UNIT CODE:** AGR/CU/SARD/BC/01/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Communication Skills

**Duration of Unit:** 25hours

**Unit Description**

This unit covers the competencies required to demonstrate communication skills. It involves meeting communication needs of clients and colleagues, contributing to the development of communication strategies, conducting workplace interviews, facilitating group discussions and representing the organisation.

**Summary of Learning Outcomes**

1. Meet communication needs of clients and colleagues
2. Contribute to the development of communication strategies
3. Conduct interviews
4. Facilitate group discussions
5. Represent the organization

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Meet communication needs of clients and colleagues
 | * Communication process
* Modes of communication
* Medium of communication
* Effective communication
* Barriers to communication
* Flow of communication
* Sources of information
* Organizational policies
* Organization requirements for written and electronic communication methods
* Report writing
* Effective questioning techniques (clarifying and probing)
* Workplace etiquette
* Ethical work practices in handling communication
* Active listening
* Feedback
* Interpretation
* Flexibility in communication
 | * Interview
* Third party reports
* Written texts
 |
| 1. Contribute to the development of communication strategies
 | * Dynamics of groups
* Styles of group leadership
* Openness and flexibility in communication
* Communication skills relevant to client groups
 | * Written
* Observation
 |
| 1. Conduct interviews
 | * Types of interview
* Establishing rapport
* Facilitating resolution of issues
* Developing action plans
 | * Written
* Observation
 |
| 1. Facilitate group discussions
 | * Identification of communication needs
* Dynamics of groups
* Styles of group leadership
* Presentation of information
* Encouraging group members participation
* Evaluating group communication strategies
 | * Written
* Observation
 |
| 1. Represent the organization
 | * Presentation techniques
* Development of a presentation
* Multi-media utilization in presentation
* Communication skills relevant to client groups
 | * Observation
* Written
 |

**Suggested Methods of Instruction**

* Role playing
* Viewing of related videos

**Recommended Resources**

* Desktop computers/laptops
* Internet connection
* Projectors
* Telephone

# NUMERACY SKILLS

**UNIT CODE:** AGR/CU/SARD/BC/02/5/A

**Relationship to Occupational Standards:**

This unit addresses the Unit of Competency: Demonstrate Numeracy Skills

**Duration of Unit:** 40 hours

**Unit Description**

This unit covers the competencies required to demonstrate numeracy skills. It involves calculating with whole numbers and familiar fractions, decimals, and percentages for work estimating, measuring, and calculating with routine metric measurements for work, using routine maps and plans for work, interpreting, drawing and constructing 2D and 3D shapes for work, interpreting routine tables, graphs and charts for work, collecting data and constructing routine tables and graphs for work and using basic functions of calculator

**Summary of Learning Outcomes**

1. Calculate with whole numbers and familiar fractions, decimals and percentages for work
2. Estimate, measure and calculate with routine metric measurements for work
3. Use routine maps and plans for work
4. Interpret, draw and construct 2D and 3D shapes for work
5. Interpret routine tables, graphs and charts for work
6. Collect data and construct routine tables and graphs for work
7. Use basic functions of calculator

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Calculate with whole numbers and familiar fractions, decimals and percentages for work
 | * Interpretation of whole numbers, fractions, decimals, percentages and rates
* Calculations involving several steps
* Calculation with whole numbers and routine or familiar fractions, decimals and percentages
* Conversion between equivalent forms of fractions, decimals and percentages
* Application of order of operations to solve multi-step calculations
* Application of problem solving strategies
* Making estimations to check reasonableness of problem solving process, outcome and its appropriateness to the context and task
* Use of formal and informal mathematical language and symbolism to communicate the result of a task
 | * Written
* Practical test
* Observation
 |
| 1. Estimate, measure and calculate with routine metric measurements for work
 | * Selection and interpretation of measurement information in workplace tasks and texts
* Identification and selection of routine measuring equipment
* Estimation and making measurements using correct units
* Estimation and calculation using routine measurements
* Performing conversions between routinely used metric units
* Using problem solving processes to undertake tasks
* Recording information using mathematical language and symbols
 | * Written
* Practical test
* Observation
 |
| 1. Use routine maps and plans for work
 | * Identification of features in routine maps and plans
* Symbols and keys used in routine maps and plans
* Identification and interpretation of orientation of map to North
* Demonstrate understanding of direction and location
* Apply simple scale to estimate length of objects, or distance to location or object
* Give and receive directions using both formal and informal language
 | * Written
* Practical test
* Observation
 |
| 1. Interpret, draw and construct 2D and 3D shapes for work
 | * Identify two dimensional shapes and routine three-dimensional shapes in everyday objects and in different orientations
* Explain the use and application of shapes
* Use formal and informal mathematical language and symbols to describe and compare the features of two-dimensional shapes and routine three-dimensional shapes
* Identify common angles
* Estimate common angles in everyday objects
* Use formal and informal mathematical language to describe and compare common angles
* Use common geometric instruments to draw two dimensional shapes
* Construct routine three-dimensional objects from given nets
 |  • Written• Practical test• Observation |
| 1. Interpret routine tables, graphs and charts for work
 | * Identify routine tables, graphs and charts in predominately familiar texts and contexts
* Identify common types of graphs and their different uses
* Identify features of tables, graphs and charts
* Locate specific information
* Perform calculations to interpret information
* Explain how statistics can inform and persuade
* Identify misleading statistical information
* Discuss information relevant to the workplace
 | * Oral
* Written
* Practical test
* Observation
 |
| 1. Collect data and construct routine tables and graphs for work
 | * Identify features of common tables and graphs
* Identify uses of different tables and graphs
* Determine data and variables to be collected
* Determine audience
* Select a method to collect data
* Collect data
* Collate information in a table
* Determine suitable scale and axes
* Draft and draw graph to present information
* Check that data meets the expected results and context
* Report or discuss information using formal and informal mathematical language
 | * Written
* Practical test
* Observation
 |
| 1. Use basic functions of calculator
 | * Identify and use keys for basic functions on a calculator
* Calculate using whole numbers, money and routine decimals and percentages
* Calculate with routine fractions and percentages
* Apply order of operations to solve multi-step calculations
* Interpret display and record result
* Make estimations to check reasonableness of problem-solving process, outcome and its appropriateness to the context and task
* Use formal and informal mathematical language and appropriate symbolism and conventions to communicate the result of the task
 | * Written
* Practical test
* Observation
 |

# Suggested Methods of Instruction

* Demonstrations
* Role playing
* Viewing of related videos
* Discussion
* Assignments

**Recommended resources**

* Calculators
* Basic measuring instruments

# DIGITAL LITERACY

**UNIT CODE:** AGR/CU/SARD/BC/03/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Digital Literacy

**Duration of Unit:** 45 hours

**Unit Description**

This unit covers the competencies required to demonstrate digital literacy. It involves identifying appropriate computer software and hardware, applying security measures to data, hardware, software in automated environment, applying computer software in solving tasks, applying internet and email in communication at workplace, applying desktop publishing in official assignment and preparing presentation packages.

**Summary of Learning Outcomes**

1. Identify computer software and hardware
2. Apply security measures to data, hardware, software in automated environment
3. Apply computer software in solving tasks
4. Apply internet and email in communication at workplace
5. Apply desktop publishing in official assignments
6. Prepare presentation packages

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Identify computer hardware and software
 | * Concepts of ICT
* Functions of ICT
* History of computers
* Components of a computer
* Classification of computers
 | * Written tests
* Oral presentation
* Observation
 |
| 1. Apply security measures to data, hardware and software
 | * Data security and control
* Security threats and control measures
* Types of computer crimes
* Detection and protection against computer crimes
* Laws governing protection of ICT
 | * Written tests
* Oral presentation
* Observation
* Project
 |
| 1. Apply computer software in solving tasks
 | * Operating system
* Word processing
* Spread sheets
* Data base design and manipulation
* Data manipulation, storage and retrieval
 | * Oral questioning
* Observation
* Project
 |
| 1. Apply internet and email in communication at workplace
 | * Computer networks
* Network configurations
* Uses of internet
* Electronic mail (e-mail) concept
 | * Oral questioning
* Observation
* Oral presentation
* Written report
 |
| 1. Apply desktop publishing in official assignments
 | * Concept of desktop publishing
* Opening publication window
* Identifying different tools and tool bars
* Determining page layout
* Opening, saving and closing files
* Drawing various shapes using DTP
* Using colour pellets to enhance a document
* Inserting text frames
* Importing and exporting text
* Object linking and embedding
* Designing of various publications
* Printing of various publications
 | * Oral questioning
* Observation
* Oral presentation
* Written report
* Project
 |
| 1. Prepare presentation packages
 | * Types of presentation packages
* Procedure of creating slides
* Formatting slides
* Presentation of slides
* Procedure for editing objects
 | * Oral questioning
* Observation
* Oral presentation
* Written report
* Project
 |

**Suggested Methods of Instruction**

* Demonstration
* Viewing of related videos
* Discussions
* Assignments
* Direct instructions

**Recommended Resources**

* Computers
* Other digital devices
* Printers
* Storage devices
* Internet access
* Computer software

# ENTREPRENEURIAL SKILLS

**UNIT CODE:** AGR/CU/SARD/BC/04/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Entrepreneurship

**Duration of unit:** 70 hours

**Unit Description**

This unit covers the competencies required to demonstrate understanding of entrepreneurship. It involves demonstrating understanding of an entrepreneur, entrepreneurship and self-employment. It also involves identifying entrepreneurship opportunities, creating entrepreneurial awareness, applying entrepreneurial motivation and developing business innovative strategies.

**Summary of Learning Outcomes**

* 1. Demonstrate understanding of an entrepreneur
	2. Demonstrate knowledge of entrepreneurship and self-employment
	3. Identify entrepreneurship opportunities
	4. Create entrepreneurial awareness
	5. Apply entrepreneurial motivation
	6. Develop innovative business strategies
	7. Develop Business plan

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Demonstrate knowledge of entrepreneurship and self-employment
 | * Importance of self-employment
* Requirements for entry into self-employment
* Role of an Entrepreneur in business
* Contributions of
* Entrepreneurs to National development
* Entrepreneurship culture in Kenya
* Born or made entrepreneurs
 | * Individual/group assignments
* Projects
* Written tests
* Oral questions
* Third party
* report
* Interviews
 |
| 1. Identify entrepreneurship opportunities
 | * Business ideas and opportunities
* Sources of business ideas
* Business life cycle
* Legal aspects of business
* Assessment of product demand
* Business environment
* Factors to consider when evaluating business environment
* Technology in business
 | * Individual/group assignments
* Projects
* Written tests
* Oral questions
* Third party report
* Interviews
 |
| 1. Create entrepreneurial awareness
 | * Forms of businesses
* Sources of business finance
* Factors in selecting source of business finance
* Governing policies on Small Scale Enterprises (SSEs)
* Problems of starting and operating SSEs
 | * Individual/group assignments
* Projects
* Written tests
* Oral questions
* Third party report
* Interviews
 |
| 1. Apply entrepreneurial motivation
 | * Internal and external motivation
* Motivational theories
* Self-assessment
* Entrepreneurial orientation
* Effective communications in entrepreneurship
* Principles of communication
* Entrepreneurial motivation
 | * Case studies
* Individual/group assignments
* Projects
* Written tests
* Oral questions
* Third party report
* Interviews
 |
| 1. Develop business innovative strategies
 | * Innovation in business
* Small business Strategic Plan
* Creativity in business development
* Linkages with other entrepreneurs
* ICT in business growth and development
 | * Case studies
* Individual/group assignments
* Projects
* Written tests
* Oral questions
* Third party report
* Interviews
 |
| 1. Develop Business Plan
 | * Business description
* Marketing plan
* Organizational/Management
* plan
* Production/operation plan
* Financial plan
* Executive summary
* Presentation of Business Plan
 | * Case studies
* Individual/group assignments
* Projects
* Written tests
* Oral questions
* Third party report
* Interviews
 |

**Suggested Methods of Instruction**

* Direct instruction
* Project
* Case studies
* Field trips
* Discussions
* Demonstration
* Question and answer
* Problem solving
* Experiential
* Team training

**Recommended Resources**

* Case studies
* Business plan templates
* Computers
* Overhead projectors
* Internet
* Mobile phone
* Video clips
* Films
* Newspapers and Handouts
* Business Journals
* Writing materials

# EMPLOYABILITY SKILLS

**UNIT CODE:** AGR/CU/SARD/BC/05/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Employability Skills

**Duration of Unit:** 50 hours

**Unit Description**

This unit covers competencies required to demonstrate employability skills. It involves conducting self-management, demonstrating interpersonal communication, critical safe work habits, leading a workplace team, planning and organizing work, maintaining professional growth and development, demonstrating workplace learning, problem solving skills and managing workplace ethics.

**Summary of Learning Outcomes**

1. Conduct self-management

2. Demonstrate interpersonal communication

3. Demonstrate critical safe work habits

4. Lead small teams

5. Plan and organize work

6. Maintain professional growth and development

7. Demonstrate workplace learning

8. Demonstrate problem solving skills

9. Demonstrate workplace ethics

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Conduct self-management
 | * Self-awareness
* Formulating personal vision, mission and goals
* Strategies for overcoming life challenges
* Emotional intelligence
* Assertiveness versus aggressiveness
* Expressing personal thoughts, feelings and beliefs
* Developing and maintaining high self-esteem
* Developing and maintaining positive self-image
* Articulating ideas and aspirations
* Accountability and responsibility
* Good work habits
* Self-awareness
* Self-development
* Financial literacy
* Healthy lifestyle practices
 | * Written tests
* Oral questioning
* Interviewing
* Portfolio of evidence
* Third party report
 |
| 1. Demonstrate interpersonal communication
 | * Meaning of interpersonal communication
* Listening skills
* Types of audience
* Writing skills
* Reading skills
* Meaning of empathy
* Understanding customers’ needs
* Establishing communication networks
* Sharing information
 | * Written tests
* Oral questioning
* Interviewing
* Portfolio of evidence
* Third party report
 |
| 1. Demonstrate critical safe work habits
 | * Stress and stress management
* Punctuality and time consciousness
* Leisure
* Integratingpersonal objectives into organizational objectives
* Resources utilization
* Setting work priorities
* HIV and AIDS
* Drug and substance abuse
* Handling emerging issues
 | * Written tests
* Oral questioning
* Interviewing
* Portfolio of evidence
* Third party report
 |
| 1. Lead a small team
 | * Leadership qualities
* Team building
* Determination of team roles and objectives
* Team performance indicators
* Responsibilities in a team
* Forms of communication
* Complementing team activities
* Gender and gender mainstreaming
* Human rights
* Maintaining relationships
* Conflicts and conflict resolution
 | * Written tests
* Oral questioning
* Interviewing
* Portfolio of evidence
* Third party report
 |
| 1. Plan and organize work
 | * Functions of management
* Planning
* Organizing
* Time management
* Decision making process
* Task allocation
* Evaluating work activities
* Resource utilization
* Problem solving
* Collecting and organising information
 | * Written tests
* Oral questioning
* Interviewing
* Portfolio of evidence
* Third party report
 |
| 1. Maintain professional growth and development
 | * Opportunities for professional growth
* Assessing training needs
* Licenses and certifications for professional growth and development
* Pursuing personal and organizational goals
* Identifying work priorities
* Recognizing career advancement
 | * Written tests
* Oral questioning
* Interviewing
* Portfolio of evidence
* Third party report
 |
| 1. Demonstrate workplace learning
 | * Managing own learning
* Contributing to the learning community at the workplace
* Cultural aspects of work
* Variety of learning context
* Application of learning
* Safe use of technology
* Identifying opportunities
* Generating new ideas
* Workplace innovation
* Performance improvement
* Handling emerging issues
* Future trends and concerns in learning
 | * Written tests
* Oral questioning
* Interviewing
* Portfolio of evidence
* Third party report
 |
| 1. Demonstrate problem solving skills
 | * Problem identification
* Problem solving
* Application of problem-solving strategies
* Resolving customer concerns
 | * Written tests
* Oral questioning
* Interviewing
* Portfolio of evidence
* Third party report
 |
| 1. Demonstrate workplace ethics
 | * Meaning of ethics
* Ethical perspectives
* Principles of ethics
* Values and beliefs
* Ethical standards
* Organization code of ethics
* Common ethical dilemmas
* Organization culture
* Corruption, bribery and conflict of interest
* Privacy and data protection
* Diversity, harassment and mutual respect
* Financial responsibility/accountability
* Etiquette
* Personal and professional integrity
* Commitment to jurisdictional laws
* Emerging issues in ethics
 | * Written tests
* Oral questioning
* Interviewing
* Portfolio of evidence
* Third party report
 |

**Suggested Methods of Instruction**

* Demonstrations
* Simulation/Role play
* Discussion
* Presentations
* Case studies
* Q&A

**Recommended Resources**

* Computers
* Stationery
* Charts
* Video clips
* Audio tapes
* Radio sets
* TV sets
* LCD projectors

**ENVIRONMENTAL LITERACY**

**UNIT CODE:** AGR/CU/SARD/BC/06/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Environmental Literacy

**Duration of Unit:** 25 hours

**Unit Description**

This unit describes the competencies required to demonstrate understanding of environmental literacy. It involves controlling environmental hazard, controlling control environmental pollution, complying with workplace sustainable resource use, evaluating current practices in relation to resource usage, identifying environmental legislations/conventions for environmental concerns, implementing specific environmental programs and monitoring activities on environmental protection/programs.

**Summary of Learning Outcomes**

1. Control environmental hazards
2. Control environmental Pollution
3. Demonstrate sustainable use of resource
4. Evaluate current practices in relation to resource usage
5. Identify Environmental legislations/conventions for environmental concerns
6. Implement specific environmental programs
7. Monitor activities on Environmental protection/Programs

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** |  **Content** | **Suggested Assessment Methods** |
| 1. Control environmental hazards
 | * Purposes and content of Environmental Management and Coordination Act 1999
* Purposes and content of Solid Waste Act
* Storage methods for environmentally hazardous materials
* Disposal methods of hazardous wastes
* Types and uses of PPE in line with environmental regulations
* Occupational Safety and Health Standards (OSHS)
 | * Written test
* Oral questions
* Observation
 |
| 1. Control environmental Pollution control
 | * Types of pollution
* Environmental pollution control measures
* Types of solid wastes
* Procedures for solid waste management
* Different types of noise pollution
* Methods for minimizing noise pollution
 | * Written test
* Oral questions
* Observation
 |
| 1. Demonstrate sustainable resource use
 | * Types of resources
* Techniques in measuring current usage of resources
* Calculating current usage of resources
* Methods for minimizing wastage
* Waste management procedures
* Principles of 3Rs (Reduce, Reuse, Recycle)
* Methods for economizing or reducing resource consumption
 | * Written test
* Oral questions
* Observation
 |
| 1. Evaluate current practices in relation to resource usage
 | * Collection of information on environmental and resource efficiency systems and procedures,
* Measurement and recording of current resource usage
* Analysis and recording of current purchasing strategies.
* Analysis of current work processes to access information and data
* Identification of areas for improvement
 | * Written test
* Oral questions
* Observation
 |
| 1. Identify Environmental legislations/conventions for environmental concerns
 | * Environmental issues/concerns
* Environmental legislations /conventions and local ordinances
* Industrial standard /environmental practices
* International Environmental Protocols (Montreal, Kyoto)
* Features of an environmental strategy
 | * Written questions
* Oral questions
* Observation
 |
| 1. Implement specific environmental programs
 | * Community needs and expectations
* Resource availability
* 5 s of good housekeeping
* Identification of programs/Activities
* Setting of individual roles /responsibilities
* Resolving problems /constraints encountered
* Consultation with stakeholders
 | * Written questions
* Oral questions
* Observation
 |
| 1. Monitor activities on Environmental protection/Programs
 | * Periodic monitoring and Evaluation of activities
* Gathering feedback from stakeholders
* Analysing data gathered
* Documentation of recommendations and submission
* Setting of management support systems to sustain and enhance the program
* Monitoring and reporting of environmental incidents to concerned /proper authorities
 | * Oral questions
* Written tests
* Practical test
* Observation
 |

**Suggested Methods of Instruction**

* Instructor led facilitation of theory
* Demonstration by trainer
* Viewing of related videos
* Project
* Assignements
* Role play

**Recommended Resources**

* Standard operating and/or other workplace procedures manuals
* Specific job procedures manuals
* Environmental Management and Coordination Act 1999
* Machine/equipment manufacturer’s specifications and instructions
* Personal Protective Equipment (PPE)
* ISO standards
* Ccompany environmental management systems (EMS)
* Montreal Protocol
* Kyoto Protocol

# OCCUPATIONAL SAFETY AND HEALTH PRACTICES

**UNIT CODE:** AGR/CU/SARD/BC/07/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Occupational Safety and Health Practices

**Duration of Unit:** 25 hours

**Unit Description**

This unit specifies the competencies required to identify workplace hazards and risk, identify and implement appropriate control measures and implement OSH programs, procedures and policies/ guidelines

**Summary of Learning Outcomes**

1. Identify workplace hazards and risk
2. Control OSH hazards
3. Implement OSH programs

**Learning Outcomes, Content and Suggested Assessment Methods**

|  |  |  |
| --- | --- | --- |
| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| 1. Identify workplace hazards and risks
 | * Identification of hazards in the workplace and/or the indicators of their presence
* Evaluation and/or work environment measurements of OSH hazards/risk existing in the workplace is conducted by
* Authorized personnel or agency
* Gathering of OHS issues and/or concerns raised
 | * Oral questions
* Written tests
* Portfolio of evidence
* Third party report
 |
| 1. Control OSH hazards
 | * Prevention and control measures, including use of PPE (personal protective equipment) for specific hazards are identified and implemented
* Appropriate risk controls based on result of OSH hazard evaluation is recommended
* Contingency measures, including emergency procedures during workplace incidents and emergencies are recognized and established in accordance with organization procedures
 | * Oral questions
* Written tests
* Portfolio of evidence
* Third party report
 |
| 1. Implement OSH programs
 | * Providing information to work team about company OHS program, procedures and policies/guidelines
* Participating in implementation of OSH procedures and policies/ guidelines
* Training of team members and advice on OSH standards and procedures
* Implementation of procedures for maintaining OSH-related records
 | * Oral questions
* Written tests
* Portfolio of evidence
* Third party report
 |

**Suggested Methods of Instruction**

* Assignments
* Discussion
* Q&A
* Role play
* Viewing of related videos

**Recommended Resources**

* Standard operating and/or other workplace procedures manuals
* Specific job procedures manuals
* Machine/equipment manufacturer’s specifications and instructions
* Personal Protective Equipment (PPE) e.g.
* Mask
* Face mask/shield
* Safety boots
* Safety harness
* Arm/Hand guard, gloves
* Eye protection (goggles, shield)
* Hearing protection (ear muffs, ear plugs)
* Hair Net/cap/bonnet
* Hard hat
* Face protection (mask, shield)
* Apron/Gown/coverall/jump suit
* Anti-static suits
* High-visibility reflective vest

# COMMON UNITS OF LEARNING

# SCIENCE FOR SARD

**UNIT CODE:** AGR/CU/SARD/CC/01/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Understanding of Science for SARD

**Duration of Unit:**  40 hours

**Unit Description**

This unit specifies the competencies required to demonstrate understanding of cell biology and physiology, movement of materials in the cell, taxonomy and phylogeny, enzymes and selective analysis, genetics photosynthesis, properties of matter and chemistry of water and soil.

**Summary of Learning Outcomes**

1. Demonstrate understanding of cell biology and physiology
2. Demonstrate understanding of movement of materials in the cell
3. Demonstrate understanding of taxonomy and phylogeny.
4. Demonstrate understanding of enzymes and selective analysis
5. Demonstrate understanding of genetics
6. Demonstrate understanding of photosynthesis
7. Demonstrate understanding of properties of matter
8. Demonstrate the understanding of chemistry of water and soil

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Demonstrate understanding of cell biology and physiology
 | * Branches of biology
* Characteristics of living things.
* Meaning of the term cell.
* Organization of the cell.
* Functions of the cell organelles
* Laboratory rules and regulations
* Types of microscopes
* Parts of the microscope and their uses
* Preparation of microscope specimen
* Proper use of a microscope
* Differences between plant and animal cells
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Demonstrate understanding of movement of materials in the cell
 | * Meaning of the term diffusion
* The process of diffusion
* The role of diffusion in living organisms
* Factors affecting the rate of diffusion
* Meaning of the term osmosis
* The process of osmosis
* Osmotic pressure and potential
* Water relations in plants and animals
* The role of osmosis in living organisms
* Factors affecting rate of osmosis
* Meaning of active transport
* Role of active transport in living organisms
* Factors affecting the rate of active transport
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Demonstrate understanding of taxonomy and phylogeny.
 | * Meaning of the term taxonomy
* The goals and history of taxonomy
* Binomial classification of plants and animals
* Artificial and natural classification of plants and animals
* Taxonomic keys in classification
 | * + Written test
	+ Observation
	+ Third party report
	+ Oral questioning
	+ Interviews
 |
| 1. Demonstrate understanding of enzymes and selective analysis
 | * Meaning of the term enzymes
* Importance of enzymes
* Types of enzymes
* Mechanism of enzyme action
* Properties of enzymes
* Factors affecting enzyme activity
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Demonstrate understanding of genetics
 | * Meaning of terms
	+ Genetics
	+ Gene
	+ Genotype
	+ Phenotype
	+ Alleles
	+ Chromosomes
	+ Genetic variations
	+ Inheritable characteristics
	+ Acquired characteristics.
* Mendel’s law of genetics.
* Pearson’s square and test cross in genetics
* Incomplete dominance
* Mutation in genetics
* Application of genetics in crop breeding
* Application of genetics in animal breeding
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Demonstrate understanding of photosynthesis
 | * Meaning of photosynthesis
* Stages of photosynthesis
* Factors influencing photosynthesis
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Demonstrate understanding of properties of matter
 | * Meaning of the term matter
* States of matter
* Particle arrangement of matter
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Demonstrate the understanding of chemistry of water and soil
 | * Periodic table
* Chemical elements
* Ion exchange
* Soil pH
* Sorption and precipitation
* Organic matter interactions
* Oxidation and reduction reactions
* Chemical reactions in relation to Agriculture
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Discussions
* Direct instruction
* Assignment

**Recommended Resources**

1. Herbarium
2. Light microscope
3. Glass slides
4. Cover slips
5. Needles
6. Forceps
7. Blotting paper
8. Glass tubing,
9. Beakers
10. Swab
11. Petri dishes
12. Scalpels
13. Scissors
14. Cotton wool
15. Droppers
16. Visking tubing
17. Litmus paper
18. pH kit
19. Test tubes
20. Magnifying lens
21. Source of heat
22. Periodic table chart
23. Reagents
	1. Glycerine
	2. Safranin solution
	3. Distilled water
	4. Potassium manganate (VII) crystals
	5. Glucose
	6. Salt
24. Laboratory
25. Farm
26. Livestock
27. Crops
28. Source of power

# PRINCIPLES OF SARD

**UNIT CODE:** AGR/CU/SARD/CC/02/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Apply SARD principles

**Duration of Unit:** 120 hours

**Unit Description**

This unit specifies the competencies required to demonstrate understanding of approaches to sustainable development, soil fertility, and appropriate sustainable agriculture technologies and integration of farm enterprises, practice crop rotation, manage beneficial external associations and manage farming resources.

**Summary of Learning Outcomes**

1. Demonstrate understanding of approaches to sustainable development
2. Demonstrate understanding of soil fertility
3. Demonstrate understanding of appropriate sustainable agriculture technologies
4. Demonstrate understanding of integration of farm enterprises
5. Practice crop rotation
6. Manage beneficial external associations
7. Manage farming resources

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Demonstrate understanding of approaches to sustainable development
 | * Meaning of the terms
	+ Sustainability
	+ Development
	+ Sustainable agriculture
		- Strategy
		- Concept
		- Pillars
* Overview of sustainable -

development ( social, economic, environment and political, climate change income, food, health water, employment, human rights and securities)* The Agenda 21 (Rio-de Janairo 1992)
* Millennium development goals(MDGs)
* Sustainable Development goals (SDGs)
* Sustainable livelihoods -Development framework(SLDF)
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Demonstrate understanding of soil fertility
 | * Meaning of the terms
	+ Soil
	+ Fertility
	+ Fertile soil
	+ Agro ecological zones
* Soil formation processes
	+ Weathering
		- Chemical
		- Physical
		- Biological
* Soil properties
	+ Soil structure
	+ Soil texture
	+ Soil colour
* Soil composition
	+ Air
	+ Water
	+ Soil particles
	+ Organic mater
	+ Soil living organisms
	+ Soil minerals
		- Micro
		- macro
* Soil classification
	+ Soil properties
		- Physical
		- chemical
* Process of checking for soil fertility
	+ Mapping
	+ Sampling
	+ Testing
	+ analysis
* Causes of soil infertility
	+ Soil mineral toxicity
	+ Soil erosion
	+ Human and animal activities
* Practices for maintaining soil fertility
	+ Cover cropping
	+ Deep cultivation
	+ Minimum tillage
	+ Crop rotation
	+ Intercropping
	+ Application of fertilizers
	+ Green manure
	+ Fallowing
	+ Multiple cropping
	+ Composting
* Types of fertilizers
	+ organic
	+ inorganic
* Strategies for correcting soil mineral toxicity
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
* projects
 |
| 1. Demonstrate understanding of appropriate sustainable agriculture technologies
 | * + Meaning of terms
		- Sustainable agriculture technologies
	+ Types of sustainable agriculture technologies
		- Sunken beds
		- The raised beds
		- Hanging gardens
		- Cone/pyramid gardens
		- Keyhole gardens
		- Double dug beds
		- Multi-storey gardens
		- Mandala gardens
		- Mulching
		- Moist beds
		- Zai pits
		- Fertility trenches
		- Terracing
		- Minimum tillage
	+ Factors to consider selecting a sustainable agriculture technology
	+ Application of selected sustainable agriculture technologies
	+ Maintenance of the selected appropriate sustainable agriculture technologies
 | * + Written test
	+ Observation
	+ Third party report
	+ Oral questioning
	+ Interviews
	+ project
 |
| 1. Demonstrate understanding of integration of farm enterprises
 | * Meaning of terms
	+ Farm
	+ Enterprise
	+ Farm enterprises
	+ Integration
* Enterprise identification
* Enterprise selection
* Factors to consider when deciding on farm enterprise integration
* Advantages of integrating sustainable agriculture enterprises
* Risks management in farm enterprise integration
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Practice crop rotation
 | * Meaning of the terms
	+ Crop rotation
* Types of crops
* Identification of crops for rotation
* Factors to consider when selecting crops for rotation
* Development of a crop rotation programme
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage beneficial external associations
 | * Meaning of the term beneficial external associations
* Identification external beneficial associations
* Factors to consider when selecting beneficial external association
* Development of engagement contracts with external beneficial associations
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage farming resources
 | * Meaning of the term farming resources
* Identification of farming resources
* Identification of statutory requirements related to farming resources
* Selection of farming resources
* Planning for farming resources
* Keeping farming resource records
* Sourcing for the selected farming resources
* Maintaining and conserving farming resources
* Developing risk management plan
* Implementing risk management plan
* Managing farming resources
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Discussions
* Direct instruction
* Role play
* Case studies
* Field visits and excursions

**Recommended Resources**

1. Farm
2. Library
3. ICT
4. Farm tools and equipment
5. Crops
6. Livestock
7. Soil sampling kit
8. Soil testing kit
9. Science laboratory
10. Stationery
11. Materials for preparing technologies

# PRINCIPLES OF AGRICULTURAL ENGINEERING

**UNIT CODE:** AGR/CU/SARD/CC/03/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Apply Agricultural Engineering Principles

**Duration of Unit:**  120hrs

**Unit Description**

This unit specifies the competencies required to apply agricultural engineering principles. It involves managing soil and water resources, managing farm mechanization, farm structures and farm irrigation systems.

**Summary of Learning Outcomes**

1. Manage farm soil
2. Manage water resources
3. Manage farm power
4. Manage farm Structures.
5. Manage farm machinery
6. Manage farm irrigation systems

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Manage farm soil
 | * Meaning of the terms; soil, soil fertility, soil composition, soil properties, soil degradation, soil erosion, soil moisture, soil sampling, soil testing, soil pH and soil analysis, soil profile.
* Types of soils
* Components of soil
* Soil profile
* Soil formation
* Soil micro organisms
* Importance of soil microorganisms
* Ways in which soil losses fertility
* Types of soil erosion
* Soil sampling methods and procedures
* Soil sampling tools and equipment’s
* Levels of soil testing
* Simple soil testing procedures
* Interpretation of soil testing results
* Soil analysis documentation procedures
* Soil conservation
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage water resources
 | * + Meaning of terms, water, purification, water treatment, water pollution
	+ Sources of farm water
	+ Characteristics of farm water
	+ Causes of farm water pollution
	+ Water purification and treatment
	+ Farm water harvesting methods
	+ Types of water storage structures
	+ Farm water distribution methods
	+ Farm water distribution systems maintenance
	+ Protection of water catchment areas
	+ Waste water management
	+ Water conservation
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage farm power
 | * + Meaning of terms, farm power, renewable and non-renewable energy,
	+ Sources of farm power
	+ Selection of farm power
	+ Uses of farm power
	+ Maintenance of farm power sources
 | * + Written test
	+ Observation
	+ Third party report
	+ Oral questioning
	+ Interviews
 |
| 1. Manage farm Structures.
 | * Meaning of terms, farm structure, farmstead, farm workshop, construction materials,
* Classes of farm structures
* Uses of farm structures
* Farmstead planning
* Selection of farm structures
* Workshop tools and equipment
* Farm workshop safety procedures
* Farm workshop design and layout
* Types of construction materials
* Farm structures construction procedures
* Ways of maintaining farm structures
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage farm machinery
 | * Meaning of terms, farm machinery, farm mechanisation, engine, combustion,
* Levels of farm mechanisations
* Classes of farm machinery
* Types of farm tools and equipment
* Farm tractors
* Selection of farm machinery
* Uses of selected farm machinery
* Safe handling of farm machinery, tools and equipment
* Operation of selected farm machinery
* Maintenance of selected farm machinery
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage farm irrigation systems
 | * Meaning of terms, irrigation, irrigation systems, water deficiency, evapotranspiration, crop water requirement, irrigation feasibility, run-off , precipitation , irrigation requirement , irrigation interval ,irrigation duration , irrigation scheduling , crop coefficient factor , consumptive use , irrigation depth
* Types of irrigation
* Methods of irrigation
* Components of irrigations systems and technologies
* Irrigation requirements
* Selection of irrigation systems
* Ways of soil water loss
* Estimation of evapotranspiration
* Design of farm irrigation systems
* Installation of farm irrigation systems
* Irrigation safety procedures
* Maintenance of farm irrigation systems
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |

**Suggested Methods of Instruction**

* Demonstration by trainer
* Discussions
* Direct instruction
* Assignments
* Case studies
* Field visits and excursions

**Recommended Resources**

1. Soil sampling kit
2. Soil testing kit
3. Farm
4. Stationery
5. Computer
6. Science lab
7. Water
8. Tanks, buckets
9. Water purification kit
10. Water pipes and gutters
11. Water taps
12. Water filters
13. Roof water catchment
14. Electricity
15. Generator
16. Motor
17. Bio-gas unit
18. Farm tractor
19. Draught animals
20. Draught animals’ harnesses and hitches
21. Animal drawn carts and implements
22. Solar energy
23. Battery
24. Engine
25. Fuel
26. Ploughs
27. Planters
28. Sprayers
29. Harvesters, threshers and shellers
30. Trailers
31. Driers
32. Mills
33. Mixers
34. Pumps
35. Spirit levels
36. Line levels
37. A-frames
38. Basic survey equipment
39. Irrigation kit
40. Evaporation pan
41. Workshop tools and equipment
42. Weighing scale
43. Planting line
44. Lubricants
45. PPEs
46. Spare parts
47. Gardening tools and equipment
48. Stores
49. Sheds
50. First aid kit
51. Tools and equipment storage boxes, cabinets and shelves
52. Inventory/stock record books
53. Analysis procedure
54. Work place procedures
55. Soil testing manual
56. Soil analysis results interpretation manual
57. KEBS and International standards
58. Machinery manufacturers manuals
59. Procurement procedure

# FARM BUSINESS MANAGEMENT

**UNIT CODE:** AGR/CU/SARD/CC/04/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Manage Farm Business

**Duration of Unit:**  80 Hours

**Unit Description**

 This unit specifies the competencies required to draw farm plan, start own farm business, run farm business, market agricultural produce and Keep farm records.

**Summary of Learning Outcomes**

1. Draw farm plan
2. Start own farm business
3. Run farm business
4. Market agricultural produce
5. Keep farm records

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Draw farm plan
 | * Meaning of terms: - farm physical plan, farm layout, farm enterprise, ecological zoning, farm business, market survey
* Market survey procedure
* Types of farm business enterprises
* Analysis of farm business enterprises
* Selection of farm business enterprises
* Farm physical plan development process
* Farm physical plan implementation process
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Start own farm business
 | * + Meaning of terms: - farm business, business opportunity, market, business plan, opportunity cost, marketing plan, competitor analysis, gross margin analysis, financial plan, organization and management plan, operation and production plan, budget, cash flow statement
	+ Types of farm business opportunities
	+ Selection of farm business opportunity
	+ Farm business plan development process
	+ Types of farm business resources
	+ Types of business ownership
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Run farm business
 | * + Farm business plan implementation
	+ Farm business monitoring and evaluation
	+ Farm business calculations
	+ Farm business documentation process
 | * + Written test
	+ Observation
	+ Third party report
	+ Oral questioning
	+ Interviews
 |
| 1. Market agricultural produce
 | * Meaning of terms: -marketing channel, promotion strategies, market share, demand, supply, price, market equilibrium, customer care
* Types of promotional channels / tools
* Development of the promotional message
* Types of distribution channels for Agricultural produce
* Feedback mechanisms
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Keep farm records
 | * Meaning of the terms; - farm record, inventory, balance sheet, liability, assets, expenses, Profit and loss account, stock, cost, depreciation.
* Types of farm business records
* Farm business documentation procedure
* Gross margin analysis process
* Farm Business Audit process
* Farm business documentation
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Practice by the trainee
* Discussions
* Direct instruction

**Recommended Resources**

1. Farm
2. Farm business enterprises
3. Record books
4. Equipped farm office
5. Stationery
6. Farm Physical Plan
7. Stores
8. Farm structures
9. Source of power
10. Farm machinery
11. Source of water
12. Business plan (BP) guide
13. Work place procedure

# CLIMATE CHANGE RESILIENCE PRACTICES

**UNIT CODE:** AGR/CU/SARD/CR/05/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Practice Climate Change Resilience

**Duration of Unit: 50 hrs.**

**Unit Description**

This unit specifies the competencies required to manage climate change preparedness, climate change adaptations and climate change mitigations.

**Summary of Learning Outcomes**

1. Manage climate change preparedness
2. Manage climate change adaptations
3. Manage climate change mitigations

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Demonstrate understanding of climate change resilience concepts
 | * Meaning of terms; climate change, climate change resilience, climate change preparedness, climate change adaptation, climate change mitigation
* Global climate change
* Emerging trends and lessons learnt
* Relationship between climate change and global warming
* Causes of climate change
* Effects of climate change
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage climate change preparedness
 | * Meaning of terms; climate change preparedness
* Local area planning
* Creation of awareness to communities
* Resource mobilization for climate change
* Assessment of climate change risks and uncertainties
* Identification of climate change risk priorities
* Development of climate change early warning systems
* Identification of climate change strategies
* Development of local area climate risk reduction strategies
* Documentation and sharing of generated information
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage climate change adaptations
 | * Meaning of terms; climate change adaptations
* Local area planning
	+ Identification of climate change adaptation measures
	+ Establishment of climate change adaptation measures
* Development of drought resilient crops
* Development of carbon sink banks and stocks
* Development of energy efficient devices
* Promote use of green energy
* Development of strategic food reserves for affected communities
* Development of pasture reserves for affected communities
* Development of crops and livestock insurance policies
* Documentation and sharing of generated information
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage climate change mitigations
 | * Meaning of terms: climate change mitigations
	+ Identification of climate change mitigation measures
	+ Carry out Good Agronomic Practices (GAP)
	+ Afforestation
	+ Reduction of greenhouse gas emission
	+ Use of green energy
	+ Sustainable use of land and forests
	+ Integrated Pest Management (IPM)
	+ Management of wastes
	+ Selection of climate change mitigation measures
	+ Maintenance of climate change mitigation measures
	+ Documentation and sharing of generated information
 | * + Written test
	+ Observation
	+ Third party report
	+ Oral questioning
	+ Interviews
 |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Discussions
* Direct instruction

**Recommended Resources**

1. Reference materials(Our common future handbook, The UN SDGs,) National climate change policy, Laudato Si)
2. Land
3. Community
4. Tree seedlings
5. Pasture seeds
6. Drought tolerant Crop seeds
7. Climate change Act 2016
8. Vision 2030

# MANAGEMENT OF FARM CHEMICAL USE FOR SARD

**UNIT CODE:** AGR/CU/SARD/CC/06/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Manage Farm Chemical Use for SARD

**Duration of Unit:**  50hrs

**Unit Description**

 This unit specifies the competencies required to develop a farm chemical use risk management strategy, farm chemical use risk management measures, implement procedures for chemical management and use for SARD, and Evaluate implementation of a farm chemical use strategy for SARD.

**Summary of Learning Outcomes**

1. Develop a farm chemical use risk management strategy
2. Develop a farm chemical use risk management measure
3. Implement procedures for chemical management and use for SARD
4. Evaluate implementation of a farm chemical use strategy for SARD

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Develop a farm chemical use risk management strategy
 | * Meaning of the terms: Farm chemicals, risk management, chemical residues, good agricultural practices, drift, off label use, pests, sensitive areas in relation to chemical use, withholding period, chemical efficacy, inorganic and organic chemical, buffer zone, occupational health and safety, chemical coding
* Overview on global use of chemicals in agriculture
* Factors to consider when selecting and applying farm chemicals.
* Chemical use regulatory framework
* Chemical identification procedure
* Methods of chemical application
* Types of farm chemicals
* Classification of farm chemicals
* Calibration of equipment for chemical application
* Chemical poisoning and their effects
* Risk assessment process
* Documentation of the requirements for farm chemical use
* Chemical application procedure
* Safe handling of chemicals.
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Develop a farm chemical use risk management measure
 | * + Identification of risk factors in farm chemical use
	+ Chemical damage prevention procedure
	+ Development of risk management strategy for farm chemical use
	+ Planning for emergency situations
	+ Documentation of risk management measures for farm chemical use
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Implement procedures for chemical management and use for SARD
 | * + Implementation of risk control measures for farm chemical use
	+ Documentation procedures on chemical management
 | * + Written test
	+ Observation
	+ Third party report
	+ Oral questioning
	+ Interviews
 |
| 1. Evaluate implementation of a farm chemical use strategy for SARD
 | * Monitoring process for farm chemical use
* Evaluation of the management strategy for farm chemical use
* Assessment procedure for farm chemical use
* Documentation process for farm chemical use
* Implementation of documented recommendations
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Discussions
* Direct instruction
* Field visits/excursions

**Recommended Resources**

1. Agrochemicals
2. Application tools and equipment
3. PPEs
4. Source of water
5. Source of power
6. Crop and livestock
7. Chemical storage structures
8. Livestock dips and spray race
9. Waste disposal sites
10. Stationery
11. Documentation equipment
12. Codes of practice
13. Farm chemical handling and transportation guidelines
14. Legislation and workplace principles

# CORE UNITS OF COMPETENCY

# CROP PRODUCTION MANAGEMENT

**UNIT CODE:** AGR/CU/SARD/CR/01/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Manage Crop Production

**Duration of Unit:**  360 hrs

**Unit Description**

This unit specifies the competencies required to produce annual crops, perennial crops, fruit crops and indigenous plants, conduct greenhouse management and other emerging technologies, produce vegetables crops, conduct floriculture crop production and dry land farming and manage crop health.

**Summary of Learning Outcomes**

1. Produce annual crops
2. Produce perennial crops
3. Produce fruit crops
4. Produce indigenous plants
5. Conduct greenhouse management and other emerging technologies
6. Produce vegetables crops
7. Conduct floriculture crop production
8. Conduct dry land farming

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Demonstrate understanding of the principles of crop production
 | * Meaning of the term principles of crop production
* Classification of crops
* Factors affecting crop production
* Plant nutrition
* Land preparation
* Plant propagation

 Meaning of terms;* Plant propagation
* Seed dormancy
* Seed dressing
* Seed rate
* Planting depth
* Plant population
* Plant spacing
* Types of planting materials
* Methods of propagation
* sexual
* asexual
* Selection of planting materials
* Preparation of planting materials
* Types of planting methods
* Plant population
* Cropping systems
* Nursery establishment and management
* Meaning of the term nursery bed
* Site selection
* Nursery bed preparation
* Seed sowing
* Nursery management practices
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage crop health
 | * Principles of crop production
* Meaning of the term crop health
* Importance of crop health
* Crop health issues
* Classification of crop pests
* Classification of crop diseases
* Classes of weeds
* Economic importance of pest, diseases and weeds
* Factors that favour crop pest, diseases and weeds
* Management of crop pest, disease and weeds
* Nutritional deficiency of crops
* Deficiency symptoms and disorders
* Management of nutritional disorders
* Management of soil and water in crop health management
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Produce annual crops
 | * Meaning of the term annual crops
* Types of annual crops
* Selection of the major annual crops
* Cereals; maize, wheat, rice, sorghum,
* Legumes/pulses; field beans, peas,
* Oil crops; sunflower, sesame seeds, groundnuts, canola.
* Roots and tubers; Irish potatoes, sweet potatoes, cassava
* The importance of the selected annual crops
* Morphology of the selected annual crops
* Ecological requirements for the selected annual crops
* Land preparation for the selected annual crops
* Plant propagation
* Establishment of the selected annual crops
* Field management of the selected annual crops
* Harvest and post-harvest handling of the selected annual crops
* Record keeping of the selected annual crops
* Marketing of the selected annual crops
* Calculation of gross margin of the selected annual crops
* Emerging issues and trends in annual crops
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Produce perennial crops
 | * Meaning of the term perennial crops
* Types of perennial crops
* Selection of the major Perennial crops
	+ Beverages; Tea and coffee
	+ Industrial crops; sugar cane, pyrethrum, cotton, sisal
* The importance of the selected perennial crops
* Morphology of the selected perennial crops
* Ecological requirements for the selected perennial crops
* Nursery establishment and management of the selected perennial crops
* Land preparation for the selected perennial crops
* Establishment of the selected perennial crops
* Field management of the selected perennial crops
* Harvest and post-harvest handling of the selected perennial crops
* Record keeping of the selected perennial crops
* Marketing of the selected perennial crops
* Calculation of the gross margin of the selected perennial crops
* Emerging issues and trends in perennial crops
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Produce fruit crops
 | * Meaning of the term fruit crops
* Types of fruit crops
* Selection of the major fruit crops
	+ Tropical; mango, citrus, passion, avocado, bananas, pineapple, tree tomato, strawberries, melons
	+ Temperate; apples, pears, peaches, plums, grapes
* The importance of the selected fruit crops
* Morphology of the selected fruit crops
* Ecological requirements for the selected fruits crops
* Fruit nursery establishment and management
* Land preparation for the selected fruit crops
* Orchard establishment of the selected fruit crops
* Orchard management of the selected fruit crops
* Harvest and post-harvest handling of the selected fruit crops
* Record keeping of the selected fruit crops
* Marketing of the selected fruit crops
* Calculation of the gross margin of the selected fruit crops
* Emerging issues and trends in fruit crops
 | * + Written test
	+ Observation
	+ Third party report
	+ Oral questioning
	+ Interviews
 |
| 1. Produce indigenous crops
 | * Meaning of ***indigenous*** crops
* Types of indigenous crops
* Selection of the major indigenous crops
* Indigenous vegetables; black night shade, spider plant, amaranths, cow peas, crotalaria
* Roots and tubers; arrow roots, yam, cassava
* Cereals; millets, sorghum
* Legumes; dolichos lablab, broad beans/lima beans
* Medicinal plants; moringa, aloe vera, neem tree, Prunus africana, thorn melons
* The importance of the selected indigenous crops
* Ecological requirements for the selected indigenous plants
* Land preparation for the selected indigenous crops
* Establishment of the selected indigenous crops
* Field management of the selected indigenous crops
* Harvest and post-harvest handling of the selected indigenous crops
* Other commonly grown vegetables that are not indigenous
* Record keeping of the selected indigenous crops
* Marketing of the selected indigenous crops
* Calculation of the gross margin of the selected indigenous crops
* Emerging issues and trends in indigenous crops
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Conduct greenhouse management and other emerging technologies
 | * Meaning of a green house
* Types of green houses
* Importance of green house
* Selected crops for greenhouse production
* Nursery establishment and management of greenhouse crops
* Seedbed preparation in greenhouse
* Preparation of growing media
* Crop establishment in greenhouse
* Management of crops in greenhouse
* Harvest and post-harvest handling of greenhouse crops
* Record keeping of crops in green house
* Calculation of the gross margin of the selected crops in green house
* Maintenance of green houses
* Marketing of the selected greenhouse crops
* Hydroponic crop growing in green houses
* Mushroom growing in green house
* Soil management in a greenhouse
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Produce vegetables crops
 | * Meaning of vegetable crops
* Types of vegetable crops
* Selection of the major vegetable crops
	+ Leafy vegetables; kales, cabbages, spinach, stinging nettles
	+ Herbs and spices; onions, coriander
	+ Stem; celery, asparagus
	+ Roots; carrots, beetroots, turnips, radishes
	+ Pods; French beans
	+ Fruits; capsicum, tomatoes, pumpkins
	+ Flowers; broccoli and cauliflower
* The importance of the selected vegetable crops
* Ecological requirements for the selected vegetable crops
* Nursery establishment and management of the selected vegetables
* Land preparation for the selected vegetable crops
* Establishment of the selected vegetable crops
* Field management of the selected vegetable crops
* Harvest and post-harvest handling of the selected vegetable crops
* Record keeping of the selected vegetable crops
* Marketing of the selected vegetable crops
* Calculation of the gross margin of the selected vegetable crops
* Emerging issues and trends in vegetable crops
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Conduct floriculture crop production
 | * Meaning of the term floriculture crops
* Types of floriculture crops
* Selection of the major floriculture crops
	+ Cut flowers: roses, carnations, sweet William, eryngium, lillies, alstroemeria, arabicum, gypsophilia,
	+ Shrubs and trees: geranium, lantana camara, bottle brushes, bouganvellia, vitex, , bergonia
	+ Climbers: money plants,
* The importance of the selected floriculture crops
* Ecological requirements for the selected floriculture crops
* Nursery establishment and management of the selected floriculture crops
* Land preparation for the selected floriculture crops
* Establishment of the selected floriculture crops
* Agronomic practices for the selected floriculture crops
* Harvest and post-harvest handling of the selected floriculture crops
* Record keeping of the selected floriculture crops
* Marketing of the selected floriculture crops
* Calculation of the gross margin of the selected floriculture crops
* Emerging issues and trends in floriculture crops
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage dry land crops
 | * Meaning of the term dry land crops
* Types of dry land crops
* Cereal crops: sorghum and pearl millets,
* Grain legumes, cow peas, dolichos, mung beans, pigeon peas, green grams
* Roots and tubers; cassava, sweet potatoes,
* Importance of dry land crops
* Selection of the technologies for dry land crop production
* Land preparation for the selected dry land crops
* Establishment of the selected dry land crops
* Field management practices of the selected dry land crops
* Harvest and post-harvest handling of the selected dry land crops
* Record keeping of the selected dry land crops
* Calculation of the gross margin of the selected dry land crops
* Marketing of the selected dry land crops
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Discussions
* Case studies
* Presentations
* Field visits
* Direct instruction

**Recommended Resources**

1. Farm
2. Crops
3. Farm tools and equipment
4. PPEs
5. Water
6. Source of power
7. Farm machinery
8. Agro-chemicals
9. Planting materials
10. Planting media
11. Farm structures
12. Green house
13. Irrigation kits
14. Construction tools and equipment
15. Dryer
16. Storage rooms
17. Documentation equipment
18. Grading equipment
19. Charts
20. ICT
21. Stationery
22. Field crops technical handbook
23. Business principles
24. Farm business records
25. Tree nursery manual
26. Farm plan
27. Vegetable crop technical handbook
28. MoALF crops manual
29. MoALF nursery management manual
30. SOPS
31. Fruit and vegetable technical handbook
32. Nursery management manual
33. Farm plan
34. MoALF production manual and HCDA
35. Floriculture handbook
36. Dry land resources manual for eastern and southern Africa
37. Crop protection handbook

# ANIMAL PRODUCTION MANAGEMENT

**UNIT CODE:** AGR/CU/SARD/CR/02/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Manage Animal Production

**Duration of Unit: 250 hours**

**Unit Description**

This unit specifies the competencies required to manage animal production. It involves managing ruminant production, non-ruminants ‘production, animal feeding, animal health, apiculture practices, fish farming practices and managing agro pastoral livestock production

**Summary of Learning Outcomes**

1. Manage ruminant production
2. Manage non-ruminants production
3. Manage animal nutrition
4. Manage forage production
5. Manage animal Health
6. Manage bee keeping practices
7. Manage fish production
8. Manage Agro pastoral livestock production

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Manage ruminant production
 | * Meaning of the term ruminant animal
* Principles of animal production
* Importance of ruminant animals
* General anatomy of the ruminants
* Types of ruminant animals
* Ruminant production systems
* Breeds of ruminant animals
* Selection of ruminants for breeding
* Selection of breeding systems
* Ruminant reproductive system
* Oestrus cycle and signs of heat in ruminant animals
* Selection of mating systems
* Gestation period and pregnancy testing
* Signs of labour and parturition
* Developing a breeding program
* Manage breeding program
* Farm layout for ruminant production
* Farm structures for ruminant production
* Housing for ruminant animals
* Sourcing of ruminant animals
* Feeding different classes of ruminant animals
* Routine management practices for ruminants
* Clean Milking Practices
* Quality production procedures
* Maintaining ruminant farm records
* Gross Margin Analysis
* Marketing of ruminant animals and products
* Environmental protection and waste management in ruminant production.
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage non-ruminants production
 | * Meaning of the term non-ruminant animal
* Importance of non-ruminants
* General anatomy of non-ruminants
* Types of non-ruminant animals
* Non-ruminant production systems
* Breeds of non-ruminant animals
* Selection of non-ruminants for breeding
* Selection of breeding systems of non-ruminants
* Non ruminant reproductive system
* Oestrus cycle and signs of heat in non-ruminant animals
* Selection of mating systems
* Gestation period and pregnancy testing
* Signs of labour and parturition
* Selection of mating systems of non-ruminants
* Development of a breeding program for non-ruminants
* Management of a breeding program for non-ruminants
* Farm layout for non-ruminant production
* Farm structures for non-ruminant production
* Housing for non-ruminant animals
* Sourcing non-ruminant animals
* Feeding different classes of non-ruminant animals
* Routine management practices for non-ruminants
* Quality production procedures
* Maintaining non-ruminant farm records
* Gross Margin Analysis
* Marketing of non-ruminant animals and products
* Environmental protection and waste management in non-ruminant production.
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage animal nutrition
 | * Meaning of the terms:
* Nutrient
* Nutrition
* Food
* Feedstuff
* Feed
* Types of animals’ nutrients
* Sources of nutrients
* Classification of feedstuffs
* Expressing Feed Values
* Nutritional values of different feedstuffs
* Digestive systems of different livestock
* Nutritional requirements of different classes of livestock.
* Sourcing of suitable feedstuff for animals
* Formulating rations for different classes of livestock.
* Feed mixing, packaging, and feed Storage
* Environmental protection and waste management in feed processing
* Developing a feeding program
* Feeds and Feeding records
* Nutritional Problems and deficiencies.
 | * + Written test
	+ Observation
	+ Third party report
	+ Oral questioning
	+ Interviews
 |
| 1. Manage forage production
 | * Agro Ecological zoning
	+ Zone mapping
	+ Matching forage to zones
* Farm planning
* Soil and water conservation
* Methods of land preparation
* Soil sampling and testing
* Types of forage
	+ Pasture
	+ Fodder crops
	+ Multi-purpose trees
* Selection of forage crops
* Sources of planting materials
* Preparation of planting materials
* Forage planting methods
* Management of forage crops
* Forage harvesting
* Forage conservation methods
* Forage storage
* Forage documentation
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage animal Health
 | * Biosecurity measures and procedures
* Occupational safety and health standards
* Methods of animal handling
* Disease control measures
* Types of parasites
	+ External
	+ Internal
* Parasites control methods
	+ Chemical
	+ Biological
	+ Integrated
* Implementation of vaccination schedules
* Livestock hoof care procedures
* Disbudding methods
* Dehorning procedures
* Grooming
* Debeaking
* Tooth clipping
* Docking
* Iron injection
* Animal welfare
* Physical signs of ill health
* Animal health record keeping
* Animal health risk management
* Waste disposal
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage bee keeping practices
 | * Meaning of the term Apiculture
* Importance of bee keeping
* Common bee keeping systems in Kenya/Africa
* Handling bee keeping equipment
* Types of bee hives and bee keeping equipment
* Construction of bee hives and bee keeping equipment
* Species/races of bees.
* Physiology of the honey bee.
* Life cycle of the honey bee.
* Bee behaviour.
* Application of bee biology to honey production.
* Apiary management practises.
* Swarming of bees
* Bee forages
* Honey bee colony management schedule
* Bee and hive products
* Harvesting of bee and hive products
* Extraction of bee and hive products
* Processing of bee and hive products
* Pests and diseases that affect bees
* Prevention of pest and diseases in bees
* Bee keeping records
* Gross margin analysis of bee enterprise
* Marketing of bee and hive products
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage fish production
 | * Meaning of the term aquaculture
* Importance of fish farming in Kenya and east Africa.
* Common types of fish in east Africa
* Choosing appropriate breeds and breeding stocks
* Breeding techniques in fish farming.
* Requirements for fish farming.
* Appropriate materials for fish farming.
* Siting a fishpond.
* Constructing a fishpond.
* Stocking a fishpond.
* Feeding fish in a pond.
* Regulating water and temperature in a fishpond.
* Common weeds in a pond.
* Managing weeds in a fishpond.
* Repair and maintenance of a fishpond.
* Fish management practices.
* Common fish predators in a pond.
* Controlling predators in a fishpond.
* Common fish diseases.
* Disease prevention and control measures in fish farming.
* Harvesting and processing of fish.
* Types of fish products
* Marketing of fish products.
* Importance of keeping fish records.
* Types of fish records.
* Maintaining accurate fish records.
* Calculating gross margins and family farm income in fish farming.
 | * Written.
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage Agro pastoral livestock production
 | * Agro-pastoralist production systems
* Types of forage trees and pastures in rangelands
* Grazing systems
* Technologies for increasing livestock production and maintaining long term productivity in ASALs
* Water harvesting technologies for livestock and forage
* Management of rangeland resources
	+ Resource utilization strategies
* Collection and management of resins.
* Ethno veterinary medicine and practices.
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Discussions
* Direct instruction
* Assignment

**Recommended Resources**

|  |
| --- |
| Functional farm with the following: |
| * Tractors
* Land
* Trailer
* Ploughs
* Harrows
* Tillers
* Sprayers
* Rakes
* Tedders
* Sire catalogues
* AI kit / services
* PPEs
* Weighing bands
* Identification equipment and materials
* Chopping implements
* Hammer mills
* Grinding mills
* Feed mixers
* Feedstuff
* Detergents
* Fumigants
* Feed troughs
* Water troughs
* Holding crush
* Ropes
* Disinfectants
* Navel clips
* Scapels
* Cleaning materials and equipment
* Weighing bands
* Hoof triming tools, equipment and structures
* Milking parlour
* Milking buckets
* Milk holding cans and cooling tanks
* Strip cup
* California Mastitis Test (CMT) kit
* Udder cloth
* Wax melter
 | * Mowers
* Forage choppers / chaff cutters
* Balers
* Forage harvesters
* Molasses
* Silage silos
* Forage planting materials
* Breeding males
* Feed rations
* Breeding records
* Stationery
* Maternity pens
* Packaging material
* Labels
* Feed stores
* Weighing balances
* Calculators
* Pest control equipment and materials
* Pasture paddocks
* Water
* Feed rations
* Hay barn
* Wheelbarrows
* Dewormers
* Drenching and bolus guns
* Acaricides
* Plunge dip and spray race
* Sprayers
* Vaccines
* Waste management equipment and material
* Grooming tools and equipment
* Teat dip
* Hand brooms, brushes and scrubbers
* Restraining ropes / chains
* Queen excluder
* Honey extractor
* Wax moulder
 | * Farm tools (Hoe, fork, rake, panga, shovel and watering cans)
* Polythene sheets and tubes
* Baling twines
* Forage box
* Breeding calendar
* Livestock Production Manual
* Fish pond
* Fish nets
* Obstetrical lubricants
* Pelletizer machines
* Sampling kits
* Feedstuff nutrient content tables
* Gunny bags
* Twines
* Feeding stalls
* Herd health records
* Disbudding and dehorning tools and materials
* Sieves
* Waste management equipment and material
* Milk record sheets / books
* Hives
* Hive tools
* Bee brush
* Feeder box
* Smokers
* Bee suit
* Catcher box
* Farm structures
* Tooth clipper
* Source of power
* livestock production manuals.
* Farm Management Handbook
* environment protection regulations and workplace procedures
* (national academy of sciences 2001)
* Good Agricultural Practices (GAP) manual
* permitted animal health procedures and practices
* work place policy
* Bee Production Manual.
* fish production manual
* rangeland management manual
* dryland farming manual
 |

# ORGANIC FARMING

**UNIT CODE:** AGR/CU/SARD/CR/03/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Demonstrate Knowledge of Organic Farming

**Duration of Unit: 60 hours**

**Unit Description**

This unit specifies the competencies required to demonstrate knowledge of principles of organic farming, pest and disease control, organic farming technologies, intensive kitchen gardening, organic crop enterprises, livestock enterprises, organic farming standards and economics of organic farming.

**Summary of Learning Outcomes**

1. Demonstrate knowledge of principles of organic farming
2. Demonstrate knowledge of pest and disease control
3. Demonstrate knowledge of appropriate organic farming technologies
4. Demonstrate knowledge of intensive kitchen gardening
5. Demonstrate knowledge of organic crop enterprises
6. Demonstrate knowledge of livestock enterprises
7. Demonstrate knowledge of organic farming standards
8. Demonstrate knowledge of economics of organic farming

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Demonstrate knowledge of principles of organic farming
 | * Meaning of the term organic farming
* Background of organic farming
* Reasons for organic farming
* Principles of organic farming
* Application of the principles of organic farming
* Soil fertility maintenance
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Demonstrate knowledge of pest and disease control
 | * + Meaning of terms pest and disease
	+ Identification of pests and diseases
	+ Classification of pests and diseases
	+ Factors leading to emergence of pests and diseases
	+ Organic pest management and control
	+ Organic disease management and control
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Demonstrate knowledge of appropriate organic farming technologies
 | * + Meaning of the term Organic farming technologies
	+ Types of existing farming technologies
	+ Selection of appropriate organic farm technologies
	+ Application of the selected organic farming technologies
 | * + Written test
	+ Observation
	+ Third party report
	+ Oral questioning
	+ Interviews
 |
| 1. Demonstrate knowledge of intensive kitchen gardening
 | * Meaning of the term intensive organic farming
* Identification of intensive organic farming systems
* Selection of intensive organic farming systems
* Implementation of the selected intensive organic farming systems
* Documentation of intensive organic farming activities
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Demonstrate knowledge of organic crop enterprises
 | * Identification of crops for organic farming
* Selection of the organic crop enterprises
* Establishment of the selected organic crop enterprises
* Management of selected organic crop enterprises
* Harvest and post-harvest handling of organic farm produce
* Marketing of organic crop produce
* Record keeping of selected organic crop enterprise
* Calculation of gross margin of the selected organic crop enterprises
* Documentation of selected organic crop enterprises
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Demonstrate knowledge of livestock enterprises
 | * Identification of organic livestock enterprises
* Selection of organic livestock enterprises
* Establishment of selected organic livestock enterprises
* Management of selected organic livestock enterprises
* Animal welfare in organic farming
* Handling and processing of organic livestock products
* Marketing of organic livestock enterprises
* Record keeping of organic livestock enterprises
* Calculation of gross margin of the organic livestock enterprises
* Documentation of organic livestock enterprises
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Demonstrate knowledge of organic farming standards
 | * Meaning of term organic farming standards
* Identification of organic farming standards
* Selection of organic farming standards
* Application of selected organic farming standards
* Documentation of organic farming standards
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Demonstrate knowledge of economics of organic farming
 | * Meaning of the term economics of organic farming
* Identification of organic farming records
* Importance of economics of organic farming
* Keeping of organic farm records
* Calculation of gross margin
* Selection of viable organic enterprises
* Documentation of economics of organic farming
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |

**Suggested Methods of Instruction**

* projects
* Demonstration by trainer
* Discussions
* Direct instruction
* Field visits/excursions

**Recommended Resources**

1. Farm
2. Livestock
3. Crops
4. Farm structures
5. Planting materials
6. Farm tools and equipment
7. ICT
8. Organic fungicides and pesticides
9. Organic fertilizers
10. Machinery
11. Water
12. Source of power
13. Irrigation kit
14. Planting media
15. Polythene tubes
16. Seedling trays
17. Textbooks
18. Stationery
19. Plants with repellant properties
20. Pest traps
21. Organic Agriculture networks guidelines
22. Integrated Pest Management Manual.
23. Organic farming manuals and standards.
24. Farm plan
25. Organic farming standards and procedures.
26. Market survey report
27. Organic livestock farming principles
28. Organic farming manuals

# AGROFORESTRY

**UNIT CODE:** AGR/CU/SARD/CR/04/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Manage Agroforestry Activities

**Duration of Unit: 60hrs**

**Unit Description**

This unit specifies the competencies required to classify agroforestry systems and technologies, identify agroforestry tree species, establish relationship between trees, crops and livestock, implement management practices in agroforestry, demonstrate understanding of Socio-economic issues in agroforestry and promote agroforestry and networking.

**Summary of Learning Outcomes**

1. Classify agroforestry systems and technologies
2. Identify agroforestry tree species
3. Establish relationship between trees, crops and livestock
4. Implement management practices in agroforestry
5. Demonstrate understanding of Socio-economic issues in agroforestry
6. Promote agroforestry and networking

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Classify agroforestry systems and technologies
 | * Meaning of terms; agroforestry, agroforestry systems, agroforestry technologies.
* Types of agroforestry systems
* Selection of agroforestry systems
* Types of agroforestry technologies
* Selection of agroforestry technologies
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Identify agroforestry tree species
 | * + Meaning of agroforestry tree species, shrubs, multipurpose trees
	+ Types of agroforestry trees
	+ Identification of agroforestry tree species
	+ Selection of agroforestry tree species
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Establish relationship between trees, crops and livestock
 | * + Identification of economic benefits of agroforestry trees
* Nutritional benefits to crops
* Nutritional benefits to livestock
* Construction and crafts
* Raw materials for industries
	+ Identification of environmental benefits of agroforestry trees
* Soil and water conservation
* Ornamental
* Windbreak
	+ Identification of socio-cultural benefits of agroforestry trees
* Medicinal
* Culinary
* Symbols of authority
* Spiritual
	+ Identification of challenges associated with agroforestry
* Cultural beliefs
* Land tenure system
* Allelopathy
 | * + Written test
	+ Observation
	+ Third party report
	+ Oral questioning
	+ Interviews
 |
| 1. Implement management practices in agroforestry system
 | * Meaning of terms: certified planting materials, pricking out, growing media, vegetative propagation, Seed propagation, Scions, buds, root stalk, mother tree, coppicing, pollarding and pruning.
* Identification of certified planting materials
* Selection of certified planting materials
* Preparation of planting material for agroforestry trees
* Preparation of planting media for agroforestry trees
* Agroforestry tree nursery establishment
* Site selection
* Nursery design and layout
* Nursery seed bed preparation
* Methods of seed sowing
* Nursery management practices
* Identification of field establishment systems
* Selection of field establishment system
* Identification of field management practices
* Selection of agroforestry field management practices
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Demonstrate understanding of Socio-economic issues in agroforestry
 | * Meaning of the terms; socio-economic, land tenure, tree tenure
* Land and tree tenure
* Land use policies and regulations as they relate to agroforestry
* Role of gender in agroforestry issues
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Promote agroforestry and networking
 | * Types of networks
* Categories of partners and partnerships
* Establishment of linkages
* Maintenance of linkages
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Discussions
* Direct instruction
* Assignment

**Recommended Resources**

1. Potting materials
2. Rooting media
3. Planting materials
4. Nursery structures
5. Nursery tools and equipment
6. Stationery
7. Computer
8. Transport means
9. Agrochemicals
10. Land
11. Water
12. Store
13. Budding knives
14. Pruning saw/knives
15. Ladder
16. Farm tools
17. Source of power
18. Rooting hormones
19. Agroforestry manual
20. Farm plan
21. Agroforestry trees and shrubs of Kenya selection manual (ICRAF)
22. MOALF nursery management manual
23. Guide to tree planting in Kenya {KEFRI, FAO)
24. Work place procedures

# FARM PRODUCE PROCESSING

**UNIT CODE:** AGR/CU/SARD/CR/05/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Process Farm Produce

**Duration of Unit:**  130 hours

**Unit Description**

This unit specifies the competencies required to harvest farm produce, process crop produce and process animal produce.

**Summary of Learning Outcomes**

1. Harvest farm produce
2. Process crop produce
3. Process animal products

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Harvest farm produce
 | * Meaning of the term crop maturity indices
* Types of crop maturity indices
* Crop harvesting methods
* PPEs, harvesting tools and equipment
* Crop harvesting procedure
* Handling harvested crop
* Transportation of harvested crop
* Storage of harvested crop
* Keeping record of harvested farm produce
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Process crop produce
 | * + Meaning of the terms; sorting, grading, processing, value addition, standardization
	+ Sorting and grading of harvested crop produce
	+ Methods of value addition
	+ Crop produce value addition procedures
	+ Processed product standardization and regulation
	+ Safe, hygienic and handling of processed crop produce
	+ Maintenance of processing facility, tools and equipment
	+ Personal hygiene management in processing crop produce
	+ Waste management
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Process animal products
 | * + Type of animal products
	+ Methods of value addition
	+ Milk value addition
	+ Meat value addition
	+ Eggs value addition
	+ Hide and skin value addition
	+ Processed product standardization and regulation
	+ Safe and hygienic handling of processed animal products
	+ Maintenance of processing facility, tools and equipment
	+ Personal hygiene management in processing animal products
	+ Waste management
	+ Keeping records of processed animal product
 | * + Written test
	+ Observation
	+ Third party report
	+ Oral questioning
	+ Interviews
 |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Discussions
* Direct instruction
* Field visits/excursions

**Recommended Resources**

1. PPEs
2. Processing unit
3. Processing tools and equipment
4. Harvesting tools and equipment
5. Baskets and buckets
6. Knives
7. Mills
8. Cultures
9. Baking equipment
10. Stabilizers
11. Flavors and colors
12. Packaging materials
13. Packaging equipment
14. Testing tools and equipment
15. Weighing balance
16. Slaughter house
17. Homogenizers
18. Pasteurizers
19. Cream separator
20. Fridges/cold rooms
21. Record books
22. Source of power
23. Crops production manual
24. Work place procedure
25. MoALF crops manual
26. SOPs
27. EMCA guidelines
28. Business plan

# SARD COMMUNITY DEVELOPMENT

**UNIT CODE:** AGR/CU/SARD/CR/06/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Conduct SARD Community Development

**Duration of Unit:**  120 Hours

**Unit Description**

This unit specifies the competencies required to conduct community mobilization, carry out community surveys, form community groups and leadership structures, build capacity to SARD stakeholders, develop community cooperative societies, develop community action plans and create awareness on SARD opportunities.

**Summary of Learning Outcomes**

1. Conduct community mobilization
2. Carry out community surveys
3. Form community groups and leadership structures
4. Build capacity to SARD stakeholders
5. Develop community cooperative societies
6. Develop community action plans
7. Create awareness on SARD opportunities

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Conduct community mobilization
 | * Meaning of terms, community, target area, needs assessment, needs prioritisation, community mobilisation
* Types of target areas
* Types of community groups
* Conducting community need assessment
* Methods of community needs prioritisation
* Types of community resources
* Methods of community mobilisation
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Carry out community surveys
 | * + Meaning of terms, community survey, survey approaches
	+ Conducting participatory community survey
	+ Methods of survey approaches
	+ Types of survey tools
	+ Selection of survey tool
	+ Pre-testing of survey tool
	+ Analysing survey data
	+ Feed backing survey results to the community
	+ Documenting survey findings
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Form community groups and leadership structures
 | * + Meaning of terms, cooperatives, leadership, leadership structures
	+ Process of community group formation
	+ Selection of community group members
	+ Types of community groups
	+ Types of leadership
	+ Formation of leadership structures
	+ Group dynamics
* Meeting procedures
* By-laws,
* Leadership & membership roles
* Conflict resolution
	+ Process of groups registration
 | * + Written test
	+ Observation
	+ Third party report
	+ Oral questioning
	+ Interviews
 |
| 1. Build capacity to SARD stakeholders
 | * Meaning of terms, resources, community and stakeholders
* Identification process of SARD community and stakeholders
* Identification of SARD gaps
* SARD community and stakeholder mobilisation process
* Types of capacity building strategies
* Trainings
* Exposure visits
* Research,
* Group discussions
* Capacity building procedures
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Develop community cooperative societies
 | * Meaning of terms, cooperatives, Cooperatives Society Act
* Types of cooperatives societies
* Process of cooperatives society formation
* Cooperatives society leadership structure formation process
* Cooperatives society registration process
* Cooperative society management procedures
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Develop community action plans
 | * Meaning of terms, community action plan
* Community action plan development procedures
* Community action plan documentation procedures
* Implementation of the community action plans
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Create awareness on SARD opportunities
 | * Meaning of terms SDGs,
* Identification of SARD opportunities
* SARD awareness creation methods
* SARD opportunities documentation procedures
* SARD opportunities dissemination process
 |  |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Discussions
* Direct instruction
* Field visits
* assignments

**Recommended Resources**

1. Community
2. Stationery
3. Computers
4. Audio visuals
5. Transport
6. Venues
7. Equipped office
8. Source of power
9. Stakeholders
10. Reference materials
11. Workplace procedures.
12. Cooperatives society Acts CAP 490 and regulations
13. Development plans/ SDGS

# MANAGEMENT OF SARD PROJECTS

**UNIT CODE:** AGR/CU/SARD/CR/07/5/A

**Relationship to Occupational Standards**

This unit addresses the Unit of Competency: Manage SARD Projects

**Duration of Unit:** 40 hours

**Unit Description**

This unit specifies the competencies required to manage project inception phase, project implementation, monitor and evaluate projects, audit and review projects, manage project environment and project closure.

**Summary of Learning Outcomes**

1. Manage project inception phase
2. Manage project implementation
3. Monitor and evaluate projects
4. Audit and review projects
5. Manage project environment
6. Manage project closure

**Learning Outcomes, Content and Suggested Assessment Methods**

| **Learning Outcome** | **Content** | **Suggested Assessment Methods** |
| --- | --- | --- |
| 1. Manage project inception phase
 | * Meaning of terms; project, project inception, project closure project concept
* Identification of SARD project
* Selection of SARD project
* Development of SARD project concept note
* Development of SARD project full proposal
* Development strategy of SARD project
* Mobilization of resources for the SARD project
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage project implementation
 | * + Development of SARD project implementation plan
	+ Procurement of resources required for the SARD project
	+ Implementation of the SARD Project
	+ Documentation of the SARD project
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Monitor and evaluate projects/
 | * + Meaning of the terms; monitoring and evaluation
	+ Development of SARD project monitoring and evaluation tools
	+ SARD project monitoring and implemented
	+ SARD project evaluation plan implemented
	+ Documentation and reporting of the SARD project M & E findings
 | * + Written test
	+ Observation
	+ Third party report
	+ Oral questioning
	+ Interviews
 |
| 1. Audit and review projects
 | * Meaning of the terms; project audit and project review
* Development of SARD project audit and review framework
* Development of SARD project audit and review tools
* Conduction of SARD project audit and review
* Documentation and reporting of lesson learnt
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage project environment
 | * Identification of SARD project impact on the environment
* Identification of mitigation measures
* Implementation of the mitigation measures
* Documentation and reporting of SARD project impact to the environment
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |
| 1. Manage project closure
 | * Identification of project exit strategies
* Implementation of Project exit strategies
* Development of project closure report
* Project asset and liability transfer
 | * Written test
* Observation
* Third party report
* Oral questioning
* Interviews
 |

**Suggested Methods of Instruction**

* Projects
* Demonstration by trainer
* Discussions
* Direct instruction

**Recommended Resources**

1. Stationary
2. ICT
3. Finances
4. Documentation equipment
5. Gantt chart
6. Farm machineries
7. Farm structures
8. Farm tools and equipment
9. Farm
10. Farm inputs
11. Farm enterprises
12. SARD principles
13. workplace procedures
14. M& E standard framework (FAO, UKDFA)
15. EMCA guidelines