



REPUBLIC OF KENYA

NATIONAL OCCUPATIONAL STANDARDS

FOR

AQUACULTURE TECHNICIAN

LEVEL 4



TVET CDACC
P.O. BOX 15745-00100
NAIROBI

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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, Vision 2030 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 in the Constitution of Kenya 2010 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 the 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 these Occupational Standards were developed for the purpose of developing a competency-based curriculum for Aquaculture Management level 4. These Occupational Standards will also be the basis for assessment of an individual for competence certification.

It is my conviction that these Occupational Standards will play a great role towards development of competent human resource for the Aquaculture sector's growth and sustainable 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 and the sessional paper No. 14 of 2012 on Reforming Education and Training in Kenya, emphasized the need to reform curriculum development, assessment and certification. This called for a shift to CBET in order 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.

The TVET Curriculum Development, Assessment and Certification Council (TVET CDACC), in conjunction with Aquaculture Sector Skills Advisory Committee (SSAC), German International Cooperation and Ministry of Agriculture, Livestock and Fisheries have developed these Occupational Standards for an Aquaculture Technician. TVET CDACC in conjunction with Micro Enterprises Support Programme Trust (MESPT) have reviewed these Occupational Standards and incorporated Food Safety. These standards will be the bases for development of competency based curriculum for Aquaculture Management level 4.

The Occupational Standards are designed and organized with clear performance criteria for each element of a unit of competency. These standards also outline the required knowledge and skills as well as evidence guide.

I am grateful to the Council Members, Council Secretariat, Aquaculture and Food safety SSAC, expert workers and all those who participated in the development and review of these Occupational Standards.

**CHAIRPERSON,
TVET CDACC**

ACKNOWLEDGMENT

These Occupational Standards were developed through combined effort of various stakeholders from private and public organizations. I am thankful to the management of these organizations for allowing their staff to participate in this course. I wish to acknowledge the invaluable contribution of industry players who provided inputs towards the development of these Standards.

I thank TVET Curriculum Development, Assessment and Certification Council (TVET CDACC) for providing guidance on the development of these Standards. My gratitude goes to Aquaculture Sector Skills Advisory Committee (SSAC) members for their contribution to the development of these Standards. I thank all the individuals and organizations who participated in the validation of these Standards.

My gratitude also goes to NEPAD Planning and Coordinating Agency (NPCA) of the Africa Union Commission and German Ministry of Economic Cooperation and Development (BMZ) through its implementing agency German International Cooperation (GIZ) GmbH which enabled the development of these Standards through the CAADP ATVET project.

I also appreciate the office of the National Coordinator of GIZ CAADP ATVET Project which was instrumental in the cooperation between the project team, Ministry of Agriculture, Livestock and Fisheries (MoALF) and Ministry of Education.

Much gratitude goes to Micro Enterprises Support Program Trust (MESPT) who initiated the review process and the incorporation of Food Safety in the Occupational Standards. I acknowledge the Danish International Development Agency (DANIDA) and the European Union (EU) who sponsored the review process.

I acknowledge all other institutions which in one way or another contributed to the development of these Standards.

CHAIRPERSON

AQUACULTURE SECTOR SKILLS ADVISORY COMMITTEE

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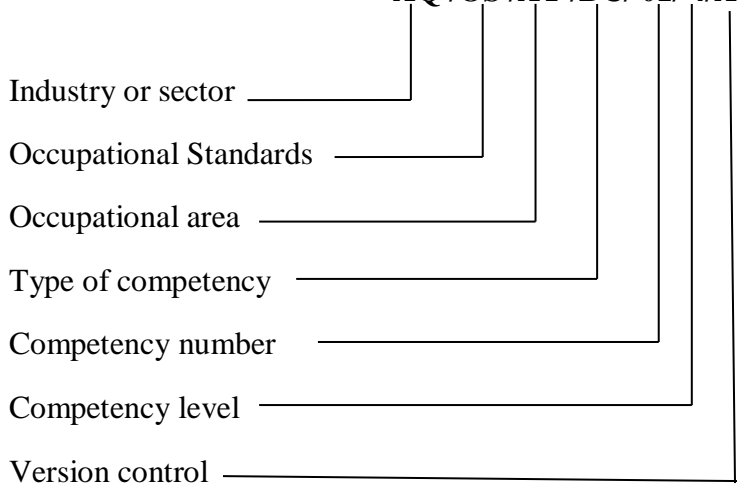
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ACRONYMS AND ABBREVIATIONS

AQ	Aquaculture
AT	Aquaculture Technician
ATVET	Agricultural Technical and Vocational Education and Training
BC	Basic Competency
CR	Core Competency
CAADP	Comprehensive Africa Agricultural Development Programme
CDACC	Curriculum Development, Assessment and Certification Council
DANIDA	Danish International Development Agency
GIZ	German International Cooperation
MESPT	Micro Enterprises Support Programme Trust
OS	Occupational Standards
PPE	Personal Protective Equipment
SSAC	Sector Skills Advisory Committee

KEY TO UNIT CODE

AQ /OS /AT /BC/ 01/ 4/A



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OVERVIEW

Aquaculture Management qualification level 4 consists of competencies for constructing fish ponds, producing on-farm formulated fish feeds as well as promoting growth of natural foods in ponds and tanks. Other competencies are stocking the ponds and tanks with fingerlings and raising these to market size under optimum conditions; operating a small-scale fish hatchery and fish harvesting, handling and processing.

This qualification consists of the following basic and core competencies:

BASIC COMPETENCY

1. Demonstrate communication skills
2. Demonstrate numeracy skills
3. Demonstrate digital literacy
4. Demonstrate entrepreneurial skills
5. Demonstrate employability skills
6. Demonstrate environmental literacy
7. Demonstrate occupational safety and health practices

CORE COMPETENCY

1. Construct fish pond
2. Produce fish feeds
3. Operate fish hatchery
4. Produce grow out fish
5. Handle harvested fish

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BASIC UNITS OF COMPETENCY

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DEMONSTRATE COMMUNICATION SKILLS

UNIT CODE: AQ/OS/AT/BC/01/4/A

UNIT DESCRIPTION

This unit covers the competencies required to gather, interpret and convey information in response to workplace requirements and to lead in the dissemination and discussion of ideas, information and issues in the workplace.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function	These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from <i>appropriate sources</i> 1.2 Effective questioning, active listening and speaking skills are used to gather and convey information 1.3 Appropriate <i>medium</i> is used to transfer information and ideas 1.4 Appropriate non- verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and <i>storage</i> of information are used 1.7 Personal interaction is carried out clearly and concisely
2. Complete relevant work-related documents	2.1 Range of forms relating to conditions of employment are completed accurately and legibly 2.2 Workplace data is recorded on standard workplace forms and documents 2.3 Basic mathematical processes are used for routine calculations 2.4 Errors in recording information on forms/ documents are identified and properly acted upon 2.5 Reporting requirements to supervisor are completed according to organizational guidelines

3. Communicate information about workplace processes	2.1 Appropriate method of communication is selected 2.2 Multiple operations involving several topics areas are communicated accordingly 2.3 Questions are used to gain extra information 2.4 Correct sources of information are identified 2.5 Information is selected and organized correctly 2.6 Verbal and written reporting is undertaken when required 2.7 Communication skills are maintained in all situations
4. Lead workplace discussion	2.8 Response to workplace issues are sought 2.9 Response to workplace issues are provided immediately 2.10 Constructive contributions are made to workplace discussions on such issues as production, quality and safety 2.11 Goals/objectives and action plan undertaken in the workplace are communicated accordingly
5. Identify and communicate issues arising in the workplace	3.1 Issues and problems are identified as they arise 3.2 Information regarding problems and issues are organized coherently to ensure clear and effective communication 3.3 Dialogue is initiated with appropriate personnel 3.4 Communication problems and issues are raised as they arise

RANGE

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

Variable	Range
<ul style="list-style-type: none"> • Methods of communication include but not limited to: 	<ul style="list-style-type: none"> • Non-verbal gestures • Verbal • Face to face • Two-way radio • Speaking to groups • Using telephone • Written • Internet
<ul style="list-style-type: none"> • Workplace discussion include but not limited to: 	<ul style="list-style-type: none"> • Coordination meetings • Toolbox discussion • Peer-to-peer discussion

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REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Organize information
- Understand and convey intended meaning
- Participate in variety of workplace discussions
- Comply with organization requirements for the use of written and electronic communication methods
- Effective report writing
- Effective clarifying and probing skills

Required Knowledge

The individual needs to demonstrate knowledge of:

- Organization requirements for written and electronic communication methods
- Effective verbal communication methods
- Report writing
- Effective questioning techniques (clarifying and probing)
- Workplace etiquette

EVIDENCE GUIDE

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

<p>1. Critical aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <p>1.1 Dealt with a range of communication/information at one time</p> <p>1.2 Made constructive contributions in workplace issues</p> <p>1.3 Sought workplace issues effectively</p> <p>1.4 Responded to workplace issues promptly</p>
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	<p>1.5 Presented information clearly and effectively in written form</p> <p>1.6 Used appropriate sources of information</p> <p>1.7 Asked appropriate questions</p> <p>1.8 Provided accurate information</p>
2. Resource Implications	<p>The following resources should be provided:</p> <p>2.1 Variety of Information</p> <p>2.2 Communication tools</p> <p>2.3 Simulated workplace</p>
3. Methods of Assessment	<p>3.1 Case Study</p> <p>3.2 Third-party reports</p> <p>3.3 Portfolio</p> <p>3.4 Interview</p> <p>3.5 Role Play</p>
4. Context of Assessment	<p>Competency may be assessed individually in the actual workplace or through accredited institution</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

DEMONSTRATE NUMERACY SKILLS

UNIT CODE: AQ/OS/AT/BC/02/4/A

UNIT DESCRIPTION

This unit covers the competencies required to perform numerical functions. The person who is competent in this unit shall be able to: Identify and use whole numbers and simple fractions, decimals and percentages; Identify, measure and estimate familiar quantities for work, Read and use familiar maps, plans and diagrams for work, Identify and describe common 2D and some 3D shapes for work, Construct simple tables and graphs for work using familiar data, Identify and interpret information in familiar tables, graphs and charts for work.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range.</i>
1. Identify and use whole numbers and simple fractions, decimals and percentages for work	1.1 Simple fractions, decimals and percentages identified and interpreted 1.2 understanding of place value by organising numbers from smallest to largest demonstrated 1.3 Required numerical information located and decision made on appropriate method to solve a problem 1.4 Limited range of calculations performed using the 4 operations 1.5 Links between operations described 1.6 Estimations made to check reasonableness of results of problem-solving process 1.7 Numerical information recorded, and the result of the task communicated using informal and some formal language and symbolism

<p>2. Identify, measure and estimate familiar quantities for work</p>	<p>2.1 Measurement information in workplace tasks and texts identified and interpreted</p> <p>2.2 Familiar units of measurement needed for tasks is identified</p> <p>2.3 Familiar and simple amounts estimated</p> <p>2.4 Appropriate measuring equipment selected</p> <p>2.5 Simple measuring equipment graduated in familiar units to measure relevant quantities is used</p> <p>2.6 Calculation done using familiar units of measurement</p> <p>2.7 measurements and results checked against estimates</p> <p>2.8 Results are recorded or reported</p> <p>2.9 Results relevant to the workplace task are communicated using informal and some formal mathematical and general language</p>
<p>3. Read and use familiar maps, plans and diagrams for work</p>	<p>3.1 Items and places are in familiar maps, plans and diagrams</p> <p>3.2 Common symbols and keys recognised in familiar maps, plans and diagrams</p> <p>3.3 Understanding of direction and location demonstrated by describing the location of objects, or route to familiar places</p> <p>3.4 Instructions to locate familiar objects or places are given and followed</p> <p>3.5 Informal and some formal oral mathematical language and symbols are used</p>
<p>4. Identify and describe common 2D and some 3D shapes for work</p>	<p>4.1 Common 2D shapes and some common 3D shapes in familiar situations are identified and named</p> <p>4.2 Common 2D shapes and designs are compared and classified</p> <p>4.3 Informal and some formal language used to describe common two-dimensional shapes and some common three-dimensional shapes</p> <p>4.4 Simple items used to draw or construct common 2D shapes</p> <p>4.5 Common 3D shapes matched to their 2D sketches or nets</p>

<p>5. Construct simple tables and graphs for work using familiar data</p>	<p>5.1 Common types of graphs are identified and named 5.2 Familiar data to be collected is determined 5.3 A method to collect data is selected 5.4 A small amount of simple familiar data is collected 5.5 One or two variables determined from the data collected 5.6 Data ordered and collated 5.7 A table constructed, and data enter 5.8 Graphs are constructed using data from table 5.9 Results are promptly checked 5.10 Graph information related to work is reported or discussed using informal and some formal mathematical and general language</p>
<p>6. Identify and interpret information in familiar tables, graphs and charts for work</p>	<p>6.1 Simple tables are identified in familiar texts and contexts 6.2 Title, headings, rows and columns located in familiar tables 6.3 Information and data in simple tables identified and interpreted 6.4 Information is related to relevant workplace tasks 6.5 Familiar graphs and charts are identified in familiar texts and contexts 6.6 Title, labels, axes, scale and key from familiar graphs and charts are located 6.7 Information and data in familiar graphs and charts is identified and interpreted 6.8 Information related to relevant workplace tasks</p>

RANGE

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

Variable	Range
<ul style="list-style-type: none"> Simple measuring equipment 	<p>May include but not limited to:</p> <ul style="list-style-type: none"> Rulers Watches/clocks Scales Thermometers AVO meter

<ul style="list-style-type: none"> • Common 2D shapes and common 3D shapes 	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Round • Square • Rectangular • Triangle • Sphere • Cylinder • Cube • Polygons • Cuboids
<ul style="list-style-type: none"> • Diagrammatical representation 	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Charts • Maps • Graphs

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Applying Fundamental operations (addition, subtraction, division, multiplication)
- Using calculator
- Using different measuring tools

Required knowledge

The individual needs to demonstrate knowledge of:

- Types of common shapes
- Differentiation between two dimensional shapes / objects
- Formulae for calculating area and volume
- Types and purpose of measuring instruments
- Units of measurement and abbreviations
- Fundamental operations (addition, subtraction, division, multiplication)
- Rounding techniques
- Types of fractions
- Different types of tables and graphs
- Meaning of graphs, such as increasing, decreasing, and constant value

- Preparation of basic data, tables & graphs

EVIDENCE GUIDE

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

1. Critical aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <p>1.1 Simple fractions, decimals and percentages are correctly identified and interpreted</p> <p>1.2 Performed a limited range of calculations using the 4 operations</p> <p>1.3 Performed calculations using familiar units of measurement</p> <p>1.4 Recognised common symbols and keys in familiar maps, plans and diagrams</p> <p>1.5 Constructed simple tables and graphs using familiar data</p> <p>1.6 Identified and interpret information in familiar tables, graphs and charts</p>
2. Resource Implications	<p>2.1 Calculator</p> <p>2.2 Basic measuring instruments</p>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <p>3.1 Written Test</p> <p>3.2 Interview/Oral Questioning</p> <p>3.3 Demonstration</p>
4. Context of Assessment	<p>Competency may be assessed in an off the job setting</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

DEMONSTRATE DIGITAL LITERACY

UNIT CODE: AQ/OS/AT/BC/03/4/A

UNIT DESCRIPTION

This unit covers the competencies required to effectively demonstrate digital literacy in a working environment. It entails identifying and using digital devices such as smartphones, tablets, laptops and desktop PCs for purposes of communication and performing work related tasks at the work place.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function	These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Identify computer software and hardware	1.1 <i>Appropriate computer software</i> is identified according to manufacturer's specification 1.2 <i>Appropriate computer hardware</i> is identified according to manufacturer's specification
2. Apply security measures to data, hardware, software	2.1 <i>Data security and privacy are classified</i> in accordance with the technological situation 2.2 <i>Security and control measures</i> are applied in accordance with laws governing protection of ICT 2.3 Computer threats and crimes are detected. 2.4 Protection against computer crimes is undertaken in accordance with laws governing protection of ICT
3. Apply computer software in solving tasks	3.1 Basic <i>word processing concepts</i> are applied in resolving workplace tasks 3.2 <i>Word processing utilities</i> are applied in accordance with workplace procedures 3.3 Data is manipulated on worksheet in accordance with office procedures
4. Apply internet and email in communication at workplace	4.1 Electronic mail is applied in workplace communication in accordance with office procedures 4.2 Office internet functions are defined and executed in accordance with office procedures

	4.3 <i>Network configuration</i> and uses are determined in accordance with office operations procedures
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RANGE

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

Variable	Range
<ul style="list-style-type: none"> Appropriate computer software may include but not limited to: 	<ul style="list-style-type: none"> A collection of instructions that enable the user to interact with a <i>computer</i>, its hardware, or perform tasks. Computer tools that will help <i>computer</i> users interact with the hardware in a <i>computer</i>.
<ul style="list-style-type: none"> Appropriate computer hardware may include but not limited to: 	<ul style="list-style-type: none"> Collection of physical parts of a computer system. This includes the computer case, monitor, keyboard, and mouse and all the parts inside the computer case, such as the hard disk drive, motherboard, video card,
<ul style="list-style-type: none"> Data security and privacy may include but not limited to: 	<ul style="list-style-type: none"> Confidentiality Cloud computing Confidentiality Cyber terrorism Integrity -but-curious data serving
<ul style="list-style-type: none"> Security and control measures may include but not limited to: 	<ul style="list-style-type: none"> Countermeasures and risk reduction Cyber threat issues Risk management
<ul style="list-style-type: none"> Word processing concepts may include but not limited to: 	<ul style="list-style-type: none"> Using a special program to create, edit, and print documents
<ul style="list-style-type: none"> Network configuration may include but not limited to: 	<ul style="list-style-type: none"> Organizing and maintaining information on the components of a computer network

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Analytical skills
- Interpretation
- Typing
- Communication
- Computing (applying fundamental operations such as addition, subtraction, division and multiplication)
- Using calculator
- Basic ICT skills

Required Knowledge

The individual needs to demonstrate knowledge of:

- Input and output devices
- Central processing Unit (CPU)
- Peripherals
- Storage Media
- Software concept
- Types of concept
- Function of computer software
- Data security and privacy
- Security threats and control measures
- Computer crimes
- Detection and protection of computer crimes
- Laws governing protection of ICT
- Word processing;
 - ✓ Functions and concepts of word processing.
 - ✓ Documents and tables creation and manipulations
 - ✓ Mail merging
 - ✓ Word processing utilities
- Spread sheet;

- ✓ Meaning, formulae, function and charts, uses, layout, data manipulation and application to cell
- Networking and Internet;
 - ✓ Meaning, functions and uses of networking and internet.
 - ✓ Electronic mail and world wide web
- Emerging trends and issues in ICT;
 - ✓ Identify and apply emerging trends and issues in ICT
 - ✓ Challenges posed by emerging trends and issues

EVIDENCE GUIDE

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

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: <ul style="list-style-type: none"> 1.1 Identified input, output, CPU and storage media devices of computers in accordance to computer specification 1.2 Identified concepts, types and functions of computer software according to operation manual 1.3 Identified and controlled security threats 1.4 Detected and protected computer crimes 1.5 Applied word processing in office tasks 1.6 Prepared work sheet and applied data to the cells in accordance to workplace procedures 1.7 Used Electronic Mail for office communication as per workplace procedure 1.8 Applied internet and World Wide Web for office tasks in accordance with office procedures 1.9 Applied laws governing protection of ICT
2. Resource Implications	<ul style="list-style-type: none"> 2.1 Smartphones 2.2 Tablets 2.3 Laptops and 2.4 Desktop PCs 2.5 Desktop computer 2.6 Lap top 2.7 Calculator 2.8 Internet 2.9 Smart phone 2.10 Operations Manuals
3. Methods of Assessment	Competency may be assessed through: <ul style="list-style-type: none"> 3.1 Written Test

	3.2 Demonstration 3.3 Practical assignment 3.4 Interview/Oral Questioning 3.5 Demonstration
4. Context of Assessment	Competency may be assessed in an off and on the job setting
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

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DEMONSTRATE ENTREPRENEURIAL SKILLS

UNIT CODE: AQ/OS/AT/BC/04/4/A

UNIT DESCRIPTION

This unit covers the competencies required for creating and maintaining small scale business, establishing small business customer base, managing and growing a micro/small-scale business.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
<p>These describe the key outcomes which make up workplace function.</p>	<p>These are assessable statements which specify the required level of performance for each of the elements.</p> <p><i>Bold and italicized terms are elaborated in the Range</i></p>
<p>1. Create and maintain small-scale business</p>	<p>1.1 Generation and evaluation of business ideas is undertaken in accordance with the existing procedure</p> <p>1.2 Competencies are matched with business opportunities in accordance with business practices.</p> <p>1.3 Procedure for starting a small business is identified as per the legal requirements</p> <p>1.4 SWOT/ PESTEL analysis and or industrial survey is carried out according to office procedures</p> <p>1.5 <i>Business operations</i> are monitored and controlled following established procedures.</p> <p>1.6 Quality assurance measures are implemented consistently.</p> <p>1.7 Good relations are maintained with staff/workers.</p> <p>1.8 Policies and procedures on occupational safety and health and environmental concerns are constantly observed.</p>
<p>2. Establish small business customer base</p>	<p>2.1 Good customer relations are maintained in accordance with office procedures</p> <p>2.2 New customers and markets are identified, explored and reached out to according to the marketing plan</p> <p>2.3 Promotions/Incentives are offered to loyal customers in accordance with office procedures</p>

	<p>2.4 Additional products and services are evaluated and tried in accordance with marketing strategy</p> <p>2.5 Customer record is maintained in accordance with office procedures</p>
3. Manage small scale business	<p>3.1 Enterprise is built up and sustained through judicious control of cash flows.</p> <p>3.2 Profitability of enterprise is ensured through appropriate internal controls.</p> <p>3.3 Unnecessary or lower-priority expenses and purchases are avoided to ensure profitability</p> <p>3.4 Basic cost-benefit analysis are undertaken in accordance with office procedures</p> <p>3.5 Basic financial management are undertaken in accordance with office procedures</p> <p>3.6 Basic financial accounting is undertaken in accordance with office procedures</p> <p>3.7 Business internal controls are implemented in accordance with office procedure</p> <p>3.8 Setting business priorities and strategies is carried out according to office procedures</p> <p>3.9 Preparation and interpretation of basic financial statements is undertaken in accordance with set procedures</p> <p>3.10 Preparation of business plans for small business is undertaken in accordance with business strategy</p> <p>3.11 Business Social Responsibility is maintained in accordance with Standard Operations Procedures (SOP)</p>
4. Grow/ expand small scale business	<p>4.1 Prepared business growth strategy for small sale business in accordance with office procedures</p> <p>4.2 Incorporated technology in small scale business growth in accordance with technological trends</p> <p>4.3 Emerging issues and trends are considered in accordance with business growth strategy</p> <p>4.4 Built audience interest in product/service according to growth strategy</p> <p>4.5 Boosted cooperate communication according to business communication strategy</p>

RANGE

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

Variable	Range
<ul style="list-style-type: none">Business Strategy include but not limited to:	<ul style="list-style-type: none">Manage wastages, environmental conservation
<ul style="list-style-type: none">Business Operations include but not limited to:	<ul style="list-style-type: none">PurchasingAccounting/administrativeWork production/operations/salesMarketing
<ul style="list-style-type: none">Internal control includes but not limited to:	<ul style="list-style-type: none">Accounting systemsFinancial statements/reportsCash managementHuman resource management
<ul style="list-style-type: none">Profitability of enterprise include but not limited to:	<ul style="list-style-type: none">Operating expenses lower than income
<ul style="list-style-type: none">Communication strategy include but not limited to:	<ul style="list-style-type: none">Blue print of exchange of informationTechnology and exchange of information

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Individual marketing skills

- Using basic advertising (posters/ tarpaulins, flyers, social media,
- Basic bookkeeping/ accounting skills
- Communication skills

Required Knowledge

The individual needs to demonstrate knowledge of:

- Generation and evaluation of business ideas
- Legal requirements for starting a small business
- SWOT/ PESTEL analysis
- Occupational Safety and Health
- Public relations concepts
- Business plan
- Business financing
- Marketing strategies
- Business management and control
- Production/ operation process
- Product promotion strategies
- Market and feasibility studies
- Business ethics
- Building customer relations
- Business models and strategies
- Types and categories of businesses
- Business internal controls
- Relevant national and local legislation and regulations
- Basic quality control and assurance concepts
- Building relations with customer and employees
- Building competitive advantage of the enterprise
- Business growth strategies

EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: <ul style="list-style-type: none"> 1.1 Demonstrated entrepreneurial skills 1.2 Demonstrate competencies to create a small-scale business 1.3 Demonstrated ability to conceptualize and plan a micro/small business 1.4 Grew customer base for the small-scale business
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	<p>1.5 Demonstrated ability to manage/operate a micro/small-scale business</p> <p>1.6 Demonstrated competencies to grow a micro/small-scale business</p>
2. Resource Implications	<p>The following resources should be provided:</p> <p>2.1 Case studies on micro/small-scale enterprises</p> <p>2.2 Materials and location relevant to the proposed activity and tasks</p>
3. Methods of Assessment	<p>Competency in this unit may be assessed through:</p> <p>3.1 Case studies</p> <p>3.2 Oral Questioning</p> <p>3.3 Portfolio</p> <p>3.4 Projects</p>
4. Context of Assessment	<p>4.1 Competency may be assessed in workplace or in a simulated workplace setting</p> <p>4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

DEMONSTRATE EMPLOYABILITY SKILLS

UNIT CODE: AQ/OS/AT/BC/05/4/A

UNIT DESCRIPTION

This unit covers competencies required to demonstrate employability skills. It involves conducting self-management, demonstrating critical safe work habits, demonstrating workplace learning and workplace ethics.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
<p>These describe the key outcomes which make up workplace function.</p>	<p>These are assessable statements which specify the required level of performance for each of the elements.</p> <p><i>Bold and italicized terms are elaborated in the Range</i></p>
<p>1. Conduct self-management</p>	<p>1.1 Personal vision, mission and goals are formulated based on potential and in relation to organization objectives</p> <p>1.2 Emotions are managed as per workplace requirements</p> <p>1.3 Individual performance is evaluated and monitored according to the agreed targets.</p> <p>1.4 Assertiveness is developed and maintained based on the requirements of the job.</p> <p>1.5 Accountability and responsibility for own actions are demonstrated.</p> <p>1.6 Self-esteem and a positive self-image are developed and maintained.</p> <p>1.7 Time management, attendance and punctuality are observed as per the organization policy.</p> <p>1.8 Goals are managed as per the organization's objective</p> <p>1.9 Self-strengths and weaknesses are identified as per <i>personal objectives</i></p> <p>1.10 Critics are managed as per personal objectives</p> <p>1.11 Demonstrate interpersonal communication</p> <p>1.12 Information is shared as per communication structure</p> <p>1.13 Work activity is organized with other involved personnel as per the SOPs</p>

<p>2. Demonstrate critical safe work habits</p>	<p>2.1 Stress is managed in accordance with workplace procedures.</p> <p>2.2 Punctuality and time consciousness is demonstrated in line with workplace policy.</p> <p>2.3 Personal objectives are integrated with organization goals based on organization's strategic plan.</p> <p>2.4 Work priorities are set in accordance to workplace procedures.</p> <p>2.5 Feedback on performance is collected and evaluated based on established team learning process</p> <p>2.6 Leisure time is recognized in line with organization policy.</p> <p>2.7 Abstinence from drug and substance abuse is observed as per workplace policy.</p> <p>2.8 Awareness of HIV and AIDS is demonstrated in line with workplace requirements.</p> <p>2.9 Safety consciousness is demonstrated in the workplace based on organization safety policy.</p> <p>2.10 Emerging issues are dealt with in accordance with organization policy.</p>
<p>3. Demonstrate workplace learning</p>	<p>3.1 Personal training needs are identified and assessed in line with the requirements of the job</p> <p>3.2 Own learning is managed as per workplace policy.</p> <p>3.3 Learning opportunities are sought and allocated based on job requirement and in line with organization policy.</p> <p>3.4 Contribution to the learning community at the workplace is carried out.</p> <p>3.5 Range of media for learning are identified as per the training need</p> <p>3.6 Application of learning is demonstrated in both technical and non-technical aspects based on requirements of the job</p> <p>3.7 Enthusiasm for ongoing learning is demonstrated</p> <p>3.8 Time and effort is invested in learning new skills-based job requirements</p> <p>3.9 Willingness to learn in different context is demonstrated based on available learning opportunities arising in the workplace.</p> <p>3.10 Opportunities for performance improvement are identified proactively in area of work.</p>

	3.11 Awareness of personal role in workplace <i>innovation</i> is demonstrated.
4. Demonstrate workplace ethics	4.1 Policies and guidelines are observed as per the workplace requirements 4.2 Self-worth and profession is exercised in line with personal goals and organizational policies 4.3 Code of conduct is observed as per the workplace requirements 4.4 Personal and professional integrity is demonstrated as per the personal goals 4.5 Commitment to jurisdictional laws is demonstrated as per the workplace requirements

RANGE

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

Variable	Range
<ul style="list-style-type: none"> • Drug and substance abuse includes but not limited to: 	Commonly abused <ul style="list-style-type: none"> • Alcohol • Tobacco • Miraa • Over-the-counter drugs • Cocaine • Bhang • Glue
<ul style="list-style-type: none"> • Feedback includes but not limited to: 	<ul style="list-style-type: none"> • Verbal • Written • Informal • Formal
<ul style="list-style-type: none"> • Team includes but not limited to: 	<ul style="list-style-type: none"> • Small work group • Staff in a section/department • Inter-agency group
<ul style="list-style-type: none"> • Personal objectives include but not limited to: 	<ul style="list-style-type: none"> • Long term • Short term • Broad • Specific

<ul style="list-style-type: none"> • Innovation include but not limited to: 	<ul style="list-style-type: none"> • New ideas • Original ideas • Different ideas • Methods/procedures • Processes • New tools
<ul style="list-style-type: none"> • Emerging issues include but not limited to: 	<ul style="list-style-type: none"> • Terrorism • Social media • National cohesion • Open offices
<ul style="list-style-type: none"> • Range of media for learning include but not limited to: 	<ul style="list-style-type: none"> • Mentoring • peer support and networking • IT and courses

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Personal hygiene practices
- Intra and Interpersonal skills
- Communication skills
- Knowledge management
- Interpersonal skills
- Critical thinking skills
- Observation skills
- Organizing skills
- Negotiation skills
- Monitoring skills
- Evaluation skills
- Record keeping skills
- Problem solving skills
- Decision Making skills
- Resource utilization skills
- Resource mobilization skills

Required Knowledge

The individual needs to demonstrate knowledge of:

- Work values and ethics
- Company policies
- Company operations, procedures and standards
- Occupational Health and safety procedures
- Fundamental rights at work
- Personal hygiene practices
- Workplace communication
- Concept of time
- Time management
- Decision making
- Types of resources
- Work planning
- Resources and allocating resources
- Organizing work
- Monitoring and evaluation
- Record keeping
- Workplace problems and how to deal with them
- Negotiation
- Assertiveness
- Team work
- Gender mainstreaming
- HIV and AIDS
- Drug and substance abuse
- Leadership
- Safe work habits
- Professional growth and development
- Technology in the workplace
- Learning
- Creativity
- Innovation
- Emerging issues
 - Social media
 - Terrorism
 - National cohesion

EVIDENCE GUIDE

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

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Conducted self-management 1.2 Demonstrated critical safe work habits 1.3 Demonstrated workplace learning 1.4 Demonstrated workplace ethics
2. Resource Implications	The following resources should be provided: 2.1 Case studies/scenarios
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Oral Interview 3.2 Observation 3.3 Third Party Reports 3.4 Written
4. Context of Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

DEMONSTRATE ENVIRONMENTAL LITERACY

UNIT CODE: AQ/OS/AT/BC/06/4/A

UNIT DESCRIPTION

This unit specifies the competencies required to follow procedures for environmental hazard control, follow procedures for environmental pollution control, comply with workplace sustainable resource use and evaluate current practices in relation to resource usage.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Control environmental hazard	1.1 <i>Storage methods</i> for environmentally hazardous materials are strictly followed according to environmental regulations and OSHS. 1.2 <i>Disposal methods</i> of hazardous wastes are followed always according to environmental regulations and OSHS. 1.3 <i>PPE</i> is used according to OSHS.
2. Control environmental Pollution control	2.1 Environmental pollution <i>control measures</i> are compiled following standard protocol. 2.2 Procedures for solid waste management are observed according Environmental Management and Coordination Act 1999 2.3 Methods for minimizing <i>noise pollution</i> complied following environmental regulations.
3. Demonstrate sustainable resource use	3.1 Methods for minimizing wastage are complied with. 3.2 Waste management procedures are employed following principles of 3Rs (Reduce, Reuse, Recycle) 3.3 Methods for economizing or reducing resource consumption are practiced.

4. Evaluate current practices in relation to resource usage	<p>4.1 Information on resource efficiency <i>systems and procedures</i> are collected and provided to the work group where appropriate.</p> <p>4.2 Current resource usage is measured and recorded by members of the work group.</p> <p>4.3 Current purchasing strategies are analyzed and recorded according to industry procedures.</p> <p>4.4 Current work processes to access information and data is analyzed following enterprise protocol.</p>
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RANGE

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

Variable	Range
<ul style="list-style-type: none"> PPE may include but are not limited to: 	<ul style="list-style-type: none"> Masks Gloves Goggles Safety hat Overall Hearing protector Safety boots
<ul style="list-style-type: none"> Environmental pollution control measures may include but are not limited to: 	<ul style="list-style-type: none"> Methods for minimizing or stopping spread and ingestion of airborne particles Methods for minimizing or stopping spread and inhaling gases and fumes Methods for minimizing or stopping spread and ingestion of liquid wastes
<ul style="list-style-type: none"> Waste management Procedures may include but are not limited to: 	<ul style="list-style-type: none"> Sorting Storing of items Recycling of items Disposal of items Handling Transport

<ul style="list-style-type: none"> Resources may include but are not limited to: 	<ul style="list-style-type: none"> Electric Water Fuel Telecommunications Supplies Materials
<ul style="list-style-type: none"> Workplace environmental hazards may include but are not limited to: 	<ul style="list-style-type: none"> Biological hazards Chemical and dust hazards Physical hazards
<ul style="list-style-type: none"> Organizational systems and procedures may include but are not limited to: 	<ul style="list-style-type: none"> Supply chain, procurement and purchasing Quality assurance Making recommendations and seeking approvals

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Following storage methods of environmentally hazardous materials
- Following disposal methods of hazardous wastes
- Using PPE
- Practicing OSHS
- Complying environmental pollution control
- Observing solid waste management
- Complying methods of minimizing noise Pollution
- Complying methods of minimizing wastage
- Employing waste management procedures
- Economizing resource consumption
- Listing of resources used
- Measuring current usage of resources
- Identifying and reporting workplace environmental hazards
- Conveying all environmental issues
- Following environmental regulations
- Identifying environmental regulations

- Assessing procedures for assessing compliance
- Collecting information on environmental and resource efficiency systems and procedures, and Providing information to the work group
- Measuring and recording current resource usage
- Analysing and recording current purchasing strategies.
- Analysing current work processes to access information and data and Assisting identifying areas for improvement

Required Knowledge

The individual needs to demonstrate knowledge of:

- Storage methods of environmentally hazardous materials
- Disposal methods of hazardous wastes
- Usage of PPE Environmental regulations
- OSHS
- Types of pollution
- Environmental pollution control measures
- Different solid wastes
- Solid waste management
- Different noise pollution
- Methods of minimizing noise pollution
- Solid Waste Act
- Methods of minimizing wastage
- Waste management procedures
- Economizing of resource consumption
- Principle of 3Rs
- Types of resources
- Techniques in measuring current usage of resources
- Calculating current usage of resources
- Types of workplace environmental hazards
- Environmental regulations
- Environmental regulations applying to the enterprise.
- Procedures for assessing compliance with environmental regulations.
- 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 current work processes to access information and data Analysis of data and information
- Identification of areas for improvement

EVIDENCE GUIDE

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

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Controlled environmental hazard 1.2 Controlled environmental pollution 1.3 Demonstrated sustainable resource use 1.4 Evaluated current practices in relation to resource usage
2. Resource Implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Workplace with storage facilities 2.2 Tools, materials and equipment relevant to the tasks (ex. Cleaning tools, cleaning materials, trash bags, etc.) 2.3 PPE 2.4 Manuals and references 2.5 Legislation, policies, procedures, protocols and local ordinances relating to environmental protection 2.6 Case studies/scenarios relating to environmental Protection
3 Methods of Assessment	<p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Demonstration 3.2 Oral questioning 3.3 Written examination 3.4 Third Party Reports 3.5 Portfolio (citations/awards from GOs and NGOs, certificate of training – local and abroad) 3.6 Simulations and role-plays
4 Context of Assessment	<p>Competency may be assessed on the job, off the job or a combination of these as well as in work placement (internship). Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
5 Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

DEMONSTRATE OCUPATIONAL SAFETY AND HEALTH PRACTICES

UNIT CODE: AQ/OS/AT/BC/07/4/A

UNIT DESCRIPTION

This unit specifies the competencies required to practice safety and health, and comply with OSH requirements relevant to work

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Observe workplace procedures for hazards and risk prevention	1.1 Arrangement of work area and items in accordance with Company housekeeping procedures is followed 1.2 Work standards and procedures are followed 1.3 <i>Prevention and control measures</i> , including use of <i>safety gears/PPE</i> are applied 1.4 Standards and procedures for <i>incidents and emergencies</i> are studied and applied, as needed
2. Participate in arrangements for workplace safety and health maintenance	2.1 Orientations on <i>OSH requirements/regulations</i> of tasks is participated 2.2 Feedback on health, safety, and security concerns are provided to appropriate personnel as required in a sufficiently detailed manner. 2.3 Workplace procedures for reporting hazards, incidents, injuries and sickness are practiced 2.4 OSH requirements/ regulations and workplace safety and hazard control procedures are reviewed, and compliance reported to appropriate personnel, as needed 2.5 Needed <i>OSH-related trainings</i> are identified and proposed to appropriate personnel

RANGE

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

Variable	Range
<ul style="list-style-type: none"> • Prevention and control measures may include but are not limited to: 	<ul style="list-style-type: none"> • Eliminate the hazard (i.e., get rid of the dangerous machine) • Isolate the hazard (i.e. keep the machine in a closed room and operate it remotely; barricade an unsafe area off) • Substitute the hazard with a safer alternative (i.e., replace the machine with a safer one) • Use administrative controls to reduce the risk (i.e. give • trainings on how to use equipment safely; OSH-related • topics, issue warning signages, rotation/shifting work • schedule) • Use engineering controls to reduce the risk (i.e. use safety guards to machine) • Use personal protective equipment • Safety, Health and Work Environment Evaluation • Periodic and/or special medical examinations of workers
<ul style="list-style-type: none"> • Safety gears /PPE (Personal Protective Equipment's) may include but are not limited to: 	<ul style="list-style-type: none"> • 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

<ul style="list-style-type: none"> • Incidents and emergencies may include but are not limited to: 	<ul style="list-style-type: none"> • Chemical spills • Equipment/vehicle accidents • Explosion • Fire • Gas leak • Injury to personnel • Structural collapse • Toxic and/or flammable vapors emission.
<ul style="list-style-type: none"> • OSH requirements / regulations may include but are not limited to: 	<ul style="list-style-type: none"> • Building code • Permit to Operate
<ul style="list-style-type: none"> • OSH-related trainings may include but are not limited to: 	<ul style="list-style-type: none"> • Safety Orientations relevant to tasks • Safe and Correct Operation of Tools and Equipment • Health Orientations/trainings (Healthy Lifestyle, Prevention of drug/alcohol dependence, violence in the workplace, work-stress) • Prevention and Control of OSH Hazards in the workplace • Chemical Handling • Safety Trainings (Fire Safety, Construction Safety, Confined Space) • Prevention and Control of Work-related Injuries and Illness • Basic First-aid Trainings • Emergency Response Trainings • Trainings on use of fire-extinguisher

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Communication Skills
- Knowledge management
- Collaborating skills
- Interpersonal Skills

- Troubleshooting skills
- Critical thinking Skills
- Observation Skills

Required Knowledge

The individual needs to demonstrate knowledge of:

- General OSH principles and legislations
- Principles of good housekeeping (5S)
- Company/workplace policies/ guidelines
- Standards and safety requirements of work process and procedures
- Standard Workplace emergency plan and procedures
- Safety and health requirements of tasks
- Workplace guidelines on providing feedback on OSH and security concerns
- OSH regulations
- Hazard control procedures
- OSH trainings relevant to work

EVIDENCE GUIDE

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

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Follows work and housekeeping procedures, and complies with its requirements 1.2 Follows work standards and procedures 1.3 Applies OSH preventive and control measures, including emergency plan, standards and procedures 1.4 Participates in orientations on OSH requirements of tasks 1.5 Provides feedback on health, safety, and security concerns in a sufficiently detailed manner. 1.6 Practices workplace procedures for reporting hazards, incidents, injuries and sickness 1.7 Reviews and reports compliance to workplace OSH regulations and hazard control procedures 1.8 Identifies and proposes OSH trainings relevant to work
2. Resource Implications	The following resources should be provided:

	2.1 Facilities, materials tools and equipment necessary for the activity
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Observation/Demonstration with oral questioning 3.2 Third party report 3.3 Written exam
4. Context of Assessment	Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

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CORE UNITS OF COMPETENCY

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CONSTRUCT A FISH POND

UNIT CODE: AQ/OS/AM/CR/01/4/A

UNIT DESCRIPTION

This unit specifies the competencies required to construct a fish pond. It involves ability to Implement fish pond site food safety plan, select and prepare a fish pond construction site, excavate the pond, protect and test the completed pond.

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Implement fish pond site food safety plan	1.1 Farm site and adjacent site hazards are identified and documented 1.2 Possible sources of physical, chemical and microbial hazards are identified based on prior use of land . 1.3 Standard operating procedures for preventing and correcting fish pond site food safety risks are implemented based on the identified risks.
2. Select fish farming site	2.1 Pond and farm layout designs are interpreted in relation to the proposed site 2.2 Preliminary site measurements carried out as per the drawing designs 2.3 Site assessed for suitability, following standard site selection criteria 2.4 Identify appropriate pond locations based on land gradient and water source
3. Prepare pond construction site	3.1 Safety precautions are applied according to site requirements 3.2 Tools, equipment, materials and supplies are identified and gathered based on job requirements. 3.3 PPEs are identified and gathered as per job requirements. 3.4 Pond site is cleared of vegetation and debris following standard operational procedures 3.5 Top soil is removed to a depth determined by soil type and nature of vegetation 3.6 Site access paths marked out, cleared and leveled.
4. Excavate fish pond	4.1 Tools, equipment, materials and supplies are identified and gathered based on job requirements. 4.2 Safety precautions are applied according to site requirements

	4.3	Fish pond area is measured and pegged based on design dimensions.
	4.4	A perimeter core trench is constructed around the pond area based on soil characteristics.
	4.5	Pond area is excavated following the peg markings, to a depth recommended by the designs
	4.6	Dykes are constructed, shaped and aligned in accordance with design specifications
5. Complete pond construction	5.1	Inlets and outlets are fitted based on design specifications.
	5.2	Supply and drainage channel are constructed following peg markings as per design and topography.
	5.3	Screening devices for in-coming water are installed based on nature of predators and intruders
	5.4	Soil erosion and flood control measures are taken based on good agricultural practices manual
	5.5	Predator control measures are applied as per best management practices and identified food safety risks
	5.6	Pond is filled with water fit for aquaculture and tested following standard procedures.
	5.7	Actionable defects on the newly constructed pond are identified and corrected in accordance with SOPs.
	5.8	Water intake, pond inlets and outlets, and the drainage system are tested for amount and speed of water flow
	5.9	Finished site is cleared, fenced and landscaped as per identified risks

RANGE

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

Variable	Range
1. Prior use may include but not limited to:	<ul style="list-style-type: none"> • For animal feeding or domestic animal production; • As a waste disposal site (garbage or toxic industrial waste); • As a sanitary waste management site; • For mining activities, oil or gas extraction; • For former agricultural activities; • Adjacent land and neighbouring areas (risk of cross-contamination); • History of flooding in area of concern.

<p>2. Hazards may include but not limited to:</p>	<ul style="list-style-type: none"> • Chemical hazards <ul style="list-style-type: none"> • Heavy metals • Pesticides • Industrial chemicals • Physical hazards • Biological hazards <ul style="list-style-type: none"> • Aquatic animal diseases • Naturally occurring toxins
<p>3. Sources of hazards may include but not limited to:</p>	<ul style="list-style-type: none"> • Agricultural chemicals • Toxic plants • Fecal matter • Soil • Water
<p>4. Preventing may include but not limited to:</p>	<ul style="list-style-type: none"> • Location, design and layout of farm • Farm waste management • Pond nets • Pest control • Pond lining • Runoff control
<p>5. Water fit for aquaculture include but not limited to</p>	<ul style="list-style-type: none"> • Fish species specific recommended level of chlorine • Fish species specific Recommended pH range • Fish species specific Recommended Ammonia • Fish species specific recommended turbidity level • Free of infective pathogens
<p>6. Tools, equipment, materials and supplies include but not limited to:</p>	<ul style="list-style-type: none"> • Tools-tape measure, spirit level, jembes, spades, pangas, • Equipment-plate compactors and rollers, wheelbarrows • Materials and supplies-ropes, liners, pegs, plumbing materials, lime, cement, sand,
<p>7. PPE's include but not limited to</p>	<ul style="list-style-type: none"> • Gum boots, helmets, gloves, overalls, first aid kits
<p>8. Vegetation includes but not limited to:</p>	<ul style="list-style-type: none"> • Trees and tree stumps • Wetland grass and sedges • Shrubs and scrubs
<p>9. Soil erosion control measures include but not limited to:</p>	<ul style="list-style-type: none"> • Planting grass on the dykes, terracing

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Food safety risk assessment and communication
- Trouble shooting
- Use of tools and equipment
- Measurement
- Communication skills
- Basic first aid skills
- Numeracy

Required Knowledge

The individual needs to demonstrate knowledge of:

- Food safety Standards (codes of practice for fish and fishery products)
- Regulatory bodies/ Competent authorities
- Hazard Analysis Critical Control Point (HACCP)
- Use of tools, equipment and PPEs
- Behavior of predators and related control measures
- Wetland vegetation
- Pond and farm designs

EVIDENCE GUIDE

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

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Implemented fish pond site food safety plan 1.2 Used correct tools and equipment in construction 1.3 Cleared all vegetation and top soil, and stowed away from construction area 1.4 Constructed ponds to specified dimensions 1.5 Constructed intake, supply and drainage channels 1.6 Identified structural defects and faults in ponds and drainage system 1.7 Cleaned and stored tools and equipment as per work place procedures 1.8 Followed safety procedures
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<p>2. Resource Implications for competence certification</p>	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place 2.3 Materials relevant to the proposed activity or tasks
<p>3. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral presentation 3.3 Projects 3.4 Written tests
<p>4. Context of Assessment</p>	<p>Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
<p>5. Guidance information for assessment</p>	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

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PRODUCE FISH FEEDS

UNIT CODE: AQ/OS/AM/CR/02/4/A

UNIT DESCRIPTION

This unit specifies the competencies required to produce fish feeds. It involves the ability to implement fish feed production food safety plan, culture natural fish feeds, produce on-farm formulated fish feeds, package and store fish feeds and keep records

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Implement fish feed production food safety plan	1.1 Possible sources of physical, chemical and microbial contamination are identified 1.2 Hazards at each fish feed production stage are identified and listed 1.3 Standard operating procedures for preventing and correcting fish feed safety risks are implemented based on the identified risks.
2. Culture natural fish feeds	2.1 PPE's are identified and gathered as per task requirements 2.2 Materials and equipment for producing natural fish foods are identified and gathered based on task requirements and identified food safety risks 2.3 Pond is cleaned, limed, dried and flooded with water fit for aquaculture 2.4 Natural productivity of pond is determined based on secchi depth 2.5 Fish pond is fertilized based according to pond's natural productivity and recommended rates of fertilization while observing food safety
3. Produce on-farm formulated fish feeds	3.1 On-farm feed production materials and equipment are identified and gathered based on task requirements and identified food safety risks 3.2 Feed composition is formulated using Pearson's Square method based on available ingredients and nutrient requirements of target species 3.3 Feed ingredients are subjected to specified treatments to inactivate anti-nutritional factors 3.4 Feed ingredients are milled to fine particles while observing food hygiene standards

	<p>3.5 Feed additives where required are added as per standard and statutory requirements</p> <p>3.6 Formulated feed proportions are weighed and mixed uniformly</p> <p>3.7 Feed mixture is pelletized and/or dried to a moisture content of 10% or less</p>
4. Package and store fish feeds	<p>4.1 Fish feed is weighed and packaged in sealed bags with clear label details</p> <p>4.2 Dry fish feeds are stored in cool and dry areas</p> <p>4.3 Moist fish feeds are properly refrigerated as per the identified food safety risks</p>
5. Keep records	<p>5.1 Records of feed ingredients are prepared and kept according to site requirements</p> <p>5.2 Records of prepared feeds are prepared and kept according to site requirements</p> <p>5.3 Records of food safety parameters are maintained</p> <p>5.4 Produced feed is fed to target fish at recommended rates</p> <p>5.5 Fish growth rate is monitored according to sampling plan</p> <p>5.6 Records are kept of fish growth response to feed</p>

RANGE

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

Variable	Range
1. Sources may include but not limited to:	<ul style="list-style-type: none"> • Ingredients used for formulation of feeds • Poor storage conditions • Pests • Rodents • Agrochemicals
2. Contamination/hazards may include but not limited to:	<ul style="list-style-type: none"> • Physical hazards • Chemical hazards <ul style="list-style-type: none"> • Heavy metals • Pesticides • Industrial chemicals • Biological hazards <ul style="list-style-type: none"> • Aquatic animal diseases • Naturally occurring toxins

3. Water fit for aquaculture include but not limited to	<ul style="list-style-type: none"> • Fish species specific recommended level of chlorine • Fish species specific Recommended pH range • Fish species specific Recommended Ammonia • Fish species specific recommended turbidity level • Free of infective pathogens
4. PPE's include but not limited to	<ul style="list-style-type: none"> • Safety goggles, gum boots, helmets, gloves, dust coats, first aid kits, mouth piece
5. Materials and equipment include but not limited to:	<ul style="list-style-type: none"> • Fertilizers, secchi disk, weighing scale • Buckets , gunny bags, sticks, stakes
6. Natural productivity include but not limited to:	<ul style="list-style-type: none"> • Phytoplanktons • Zooplanktons
7. On-farm feed production materials and equipment include but not limited to:	<ul style="list-style-type: none"> • Meat mincer, blender/ grinder, weighing scale, dryer, mixer, containers, bag sealer, oven, burner, drying racks • Packaging bags, drying canvas/ polythene
8. Nutrient requirements include but not limited to:	<ul style="list-style-type: none"> • Proteins, • Lipids/fats • Ash • Carbohydrates • Moisture • Mineral and vitamin
9. Treatments include but not limited to:	<ul style="list-style-type: none"> • Roasting • Boiling • Fermentation • Sun-drying
10. Label details include but not limited to:	<ul style="list-style-type: none"> • Date of manufacture • name of manufacturer • date of expiry • storage conditions • protein level • pellet size, • species.
11. Records of feed ingredients include but not limited to:	<ul style="list-style-type: none"> • Types • Date procured • Store quantities
12. Sampling plan includes but not limited to:	<ul style="list-style-type: none"> • Sampling frequency • Sample size • Sampling time

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Food safety risk assessment and communication
- Trouble shooting
- Use of tools and equipment
- Measurement
- Mixing ingredients
- Communication
- Basic first aid
- Numeracy

Required Knowledge

The individual needs to demonstrate knowledge of:

- Food safety Standards (codes of practice for fish and fishery products)
- Regulatory bodies/ Competent authorities
- Hazard Analysis Critical Control Point (HACCP)
- Types of tools, equipment and PPEs
- On-farm fish feed formulation
- Locally available raw materials
- Nutritional composition of the raw materials and their properties

EVIDENCE GUIDE

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

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Implemented fish feed production food safety plan 1.2 Used secchi disk accurately 1.3 Formulated feed composition correctly as per target species 1.4 Applied the correct fertilizer at right amounts using appropriate method 1.5 Applied the right treatment to inactivate anti-nutritional factors in selected feed ingredients 1.6 Weighed accurate amounts of feed ingredients based on feed formulation
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	<p>1.7 Mixed feed ingredients uniformly</p> <p>1.8 Stored produced feed under recommended storage conditions</p>
2. Resource Implications for competence certification	<p>The following resources must be provided:</p> <p>2.1 Access to relevant workplace where assessment can take place</p> <p>2.2 Appropriately simulated environment where assessment can take place</p> <p>2.3 Materials relevant to the proposed activity or tasks</p>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <p>3.1 Observation</p> <p>3.2 Oral presentation</p> <p>3.3 Oral questioning</p> <p>3.4 Projects</p> <p>3.5 Written tests</p>
4. Context of Assessment	<p>Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

OPERATE FISH HATCHERY

UNIT CODE: AQ/OS/AM/CR/03/4/A

UNIT DESCRIPTION

This unit specifies the competencies required to operate a fish hatchery. It involves Implementing fish hatchery food safety plan, preparing hatchery for stocking, stocking and feeding the brood stock, naturally propagating farmed fish and harvesting the fry and fingerlings. It also involves packaging fish sees for transportation, maintaining the hatchery through cleanliness and regulating water flow rates.

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Implement fish hatchery food safety plan	1.1 Food safety <i>Hazards</i> in the fish hatchery are identified and documented 1.2 Possible <i>sources</i> of physical, chemical and microbial contamination in the hatchery are identified based on the hazards 1.3 Standard operating procedures for <i>preventing</i> and <i>correcting</i> fish feed safety risks are implemented based on the identified risks.
2. Prepare broodstock facilities	2.1 <i>PPE</i> 's are identified and gathered as per task requirements 2.2 <i>Tools, equipment and food grade materials</i> are assembled as per task requirements 2.3 Fish pond is filled with water fit for aquaculture to required depth based on pond depth and purpose 2.4 Fish pond fertilized based on recommended fertilization rates as per identified food safety risks 2.5 Fish happas are cleaned, disinfected as per cleaning and sanitation procedures and appropriately set in the fish pond 2.6 Water flow within the fish pond is set at rates suitable for species under culture and evaporation rates.
3. Stock hatchery with broodstock	3.1 Broodstock are selected based on their state of readiness for breeding by observation of physical features 3.2 Broodstock is acclimatized based on pond water temperatures 3.3 Selected broodstock for natural breeding is transferred to culture facilities based on species specific stocking density 3.4 Broodstock are released into the culture facilities based on

	fish stocking procedures
4. Feed broodstock	<p>4.1 Fish feeds are safely handled to avoid cross-contamination and adulteration.</p> <p>4.2 Feeds are weighed as per the feeding schedule for the specified fish species</p> <p>4.3 Weighed feed rations are divided by frequency of feeding as specified in the feeding schedule</p> <p>4.4 Fish is fed using any of the appropriate methods based on labour available, weather conditions, size of the culture units</p> <p>4.5 Fish feeding behavior is monitored during feeding and recorded</p>
5. Naturally propagate farmed fish	<p>5.1 The culture unit with broodstock is observed after about 2.5 weeks for presence of hatchlings based on biology of the fish</p> <p>5.2 Harvesting tools, equipment and food grade materials are assembled in line with task requirement</p> <p>5.3 Harvesting net is chosen based on mesh size and placed at the outlet</p> <p>5.4 Pond water is released from the pond based on purpose of harvesting</p> <p>5.5 Fish hatchlings and fry harvested depending on sizes and quantities required in the market</p> <p>5.6 Harvested fish is sorted according to size demanded by the market and placed into holding containers</p>
6. Package fish seeds	<p>6.1 Packaging container are assembled as per the task requirements</p> <p>6.2 Water fit for aquaculture is introduced into the packaging container to appropriate level</p> <p>6.3 Fish fry or fingerlings are counted and released into the packaging material as per the standard operating procedure</p> <p>6.4 Oxygen is released in to the package containing fish to appropriate levels</p> <p>6.5 Fish package container is airtight sealed</p>
7. Maintain the hatchery	<p>7.1 Indoor and outdoor hatchery components are cleaned with food grade cleaning agents</p> <p>7.2 Water flow levels rates and levels within the culture units are maintained based on the fish stages reared</p>

RANGE

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

Variable	Range
1. Hazards may include but not limited to:	<ul style="list-style-type: none">• Physical hazards• Chemical hazards<ul style="list-style-type: none">• Heavy metals• Pesticides• Industrial chemicals• Biological hazards<ul style="list-style-type: none">• Aquatic animal diseases• Naturally occurring toxins
2. Sources of hazards may include but not limited to:	<ul style="list-style-type: none">• Infected parent stock/ broodstock• Poor water quality• Human carriers• Cleaning agents• Pesticides• Antibiotics
3. Preventing may include but not limited to:	<ul style="list-style-type: none">• Quarantine of brooders• Good water quality• Sanitary and phytosanitary measures• Biosecurity measures
4. Correcting may include but not limited to:	<ul style="list-style-type: none">• Parasite control• Fish treatment• Water flow management• Sterilization of the hatchery
5. Food safety standards	<ul style="list-style-type: none">• Codes of practice• Principles of food hygiene
6. Water fit for aquaculture include but not limited to	<ul style="list-style-type: none">• Fish species specific recommended level of chlorine• Fish species specific Recommended pH range• Fish species specific Recommended Ammonia• Fish species specific recommended turbidity level• Free of infective pathogens
7. PPE's include but not limited to:	<ul style="list-style-type: none">• Safety goggles, gum boots, wading suit, gloves, dust coats, first aid kits, life ring, life jacket
8. Tools and equipment include but not limited to:	<ul style="list-style-type: none">• Weighing balance, measuring cylinders, perforators, basins, harvesting gear, happa nets, buckets, scoop nets, sieves of assorted sizes

9. Harvesting include but not limited to:	<ul style="list-style-type: none"> • Partial or complete harvesting
10. Materials include but not limited to:	<ul style="list-style-type: none"> • Salt, towel, warm water, feeds, fertilizers, assorted bowls, cleaning and disinfection agents
11. State of readiness include but not limited to:	<ul style="list-style-type: none"> • Ready to spawn (swollen abdomen), not yet ready, already spawned

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Food safety risk assessment and communication
- Trouble shooting
- Use of tools and equipment
- Weighing
- Numeracy
- Fish handling and packaging
- Identification of anatomical features
- Basic first aid
- Hand sexing of brooders
- Identification of signs of healthy fish

Required Knowledge

The individual needs to demonstrate knowledge of:

- Food safety Standards (codes of practice for fish and fishery products)
- Regulatory bodies/ Competent authorities
- Hazard Analysis Critical Control Point (HACCP)
- Types of tools, equipment and PPEs
- Basic fish anatomy
- Fish feeds and feeding
- Cleaning and disinfection procedures

EVIDENCE GUIDE

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

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Implemented fish hatchery food safety plan 1.2 Set water flow within hatchery at appropriate rates 1.3 Reduced stress to the fish during stocking 1.4 Fed fish as per feeding schedule and prevailing weather conditions 1.5 Produced high quality health fish seeds 1.6 Harvested and sorted fish seeds based on market demands 1.7 Minimized stress and mortalities of fish during transportation by proper packaging
2. Resource Implications for competence certification	The following resources must be provided: 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place 2.3 Materials relevant to the proposed activity or tasks
3. Methods of Assessment	Competency may be assessed through: 3.1 Observation 3.2 Oral presentation 3.3 Oral questioning 3.4 Written tests 3.5 Practical tests
4. Context of Assessment	Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

PRODUCE GROW-OUT FISH

UNIT CODE: AQ/OS/AM/CR/04/4/A

UNIT DESCRIPTION

This unit specifies the competencies required to produce grow out fish. It involves ability to implement fish grow-out food safety plan, prepare fish grow out culture units in readiness for stocking, as well as stock and feed the fish while monitoring and controlling disease occurrences. It also involves the competencies required to maintain farm cleanliness, manage other livestock that is integrated with fish farming, and harvest fish upon maturity.

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Implement Fish Grow-out Food safety plan	1.1 Food safety Hazards in the fish grow-out are identified and documented. 1.2 Possible sources of physical, chemical and microbial contamination in the fish grow-out are identified based on the hazards 1.3 Standard operating procedures for preventing and correcting fish feed safety risks are implemented based on the identified risks.
2. Prepare grow out culture units	2.1 PPEs are identified and gathered as per task requirement 2.2 Safety precautions are adhered to 2.3 Pond preparation tools, equipment and materials are assembled in line with task requirement 2.4 Land-based fish culture units are drained and dried to workable standards 2.5 Culture tanks are cleaned and disinfected as per standard sanitary operating procedures 2.6 Earthen ponds for restocking are dredged and repaired following standard procedures 2.7 Earthen pond bottoms are limed at recommended rates based on type of lime and soil type. 2.8 Culture units are filled with water fit for aquaculture to a depth recommended for the fish species to be cultured 2.9 Grow out culture units are fertilized as per the recommended fertilization rates and quantities

	<p>2.10 Water inlet and outlet systems are cleaned and screens repaired in accordance with the work place procedures</p> <p>2.11 Fish cages are repaired, cleaned, disinfected with food grade cleaning agents and assembled as per workplace procedures.</p>
3. Stock grow out culture units	<p>3.1 Source of quality fingerlings is identified from approved hatcheries and orders placed</p> <p>3.2 Tools, equipment and materials for fingerling handling and transportation are assembled in line with task requirement</p> <p>3.3 Fry or fingerlings are procured and acclimatized based on culture unit temperatures</p> <p>3.4 Fry or fingerlings are stocked into ponds following recommended stress minimization procedures</p> <p>3.5 Stocked ponds are monitored for fingerling stress and mortalities through direct observations</p>
4. Feed and maintain fish in the grow out culture units	<p>4.1 Fertilization of the culture units is carried out in accordance with secchi depth measurements</p> <p>4.2 Feeds are procured from approved sources.</p> <p>4.3 Dry fish feeds are stored in cool and dry areas</p> <p>4.4 Moist fish feeds are properly refrigerated as per the identified food safety risks</p> <p>4.5 Appropriate feeding method is determined based on type of culture system and available manpower</p> <p>4.6 Feeds are weighed as per the feeding schedule for the specified fish species and size</p> <p>4.7 Fish are fed at rates and rations outlined in the feeding schedule and periodic sampling results</p> <p>4.8 Fish feeding response is monitored and any abnormalities addressed in accordance with the farm manual.</p>
5. Maintain fish farm	<p>5.1 Maintenance tools and equipment are identified and assembled as per the task requirements</p> <p>5.2 Grass on pond dykes is cleared periodically to ground level</p> <p>5.3 Infringing vegetation is cleared as per good aquaculture practices</p> <p>5.4 Pipes and drainage channels are monitored and cleared blockages as per workplace procedures</p> <p>5.5 Screens and water flow control structures are cleaned and repaired in accordance with workplace procedures</p> <p>5.6 Water channels and intake structures are repaired and cleaned to maintain uniform water flow</p> <p>5.7 Fences and intruder control devices are checked for defects and repaired promptly as per respective repair procedures</p>

	<p>5.8 Cage farms are monitored for intruders, water quality and invasive weeds and remedial action taken following workplace procedures</p> <p>5.9 Tools and equipment are cleaned and stored as per workplace procedures</p>
6. Maintain fish culture units	<p>6.1 Grow out culture units are fertilized as per the recommended fertilization rates and quantities as per identified food safety risks</p> <p>6.2 Water inlet and outlet systems are cleaned and screens repaired in accordance with the work place procedures</p> <p>6.3 Water flow and water levels in culture units are monitored and controlled as per the daily, weekly and monthly work schedules</p> <p>6.4 Fish culture units are checked for tear-and-wear and damages and corrective measures taken following standard procedures</p> <p>6.5 Weed growth is monitored and controlled following good aquaculture practices.</p> <p>6.6 Tanks are cleaned and disinfected using food grade cleaning agents</p> <p>6.7 Fish cages are monitored for physical damages on nets and framework and repair procedures initiated as per workplace procedures</p>
7. Control disease, parasites and predators	<p>7.1 Water quality parameters are monitored as per identified food safety risks and remedial measures undertaken</p> <p>7.2 Fish ponds are fertilized as per identified risks</p> <p>7.3 Fish are checked for signs of stress and disease based on physical appearance and behavioral changes</p> <p>7.4 Peculiarities in the general fish behavior and physical appearance is monitored using a checklist provided by the farm management</p> <p>7.5 Biosecurity structures are maintained and disinfectants replenished as per the standard operating procedures</p> <p>7.6 Remedial measures for stressed and diseased fish are undertaken as per International Organization for Animal Health (OIE) guidelines</p> <p>7.7 Predator control devices are checked for defects and repaired promptly as per respective repair procedures</p> <p>7.8 Screens in pipes and channels are checked and repaired in accordance with workplace procedures</p>
8. Harvest fish	<p>8.1 Fish market is identified and contacted based on customer preferences</p> <p>8.2 Harvesting tools, equipment and materials are assembled in line with task requirement</p> <p>8.3 Harvesting of fish is carried out using appropriate equipment</p>

	<p>and techniques while observing good hygienic practices</p> <p>8.4Harvested fish are sorted according to size and species while observing good hygienic practices</p> <p>8.5Harvested fish is marketed or processed according to customer demands</p> <p>8.6Harvesting tools, equipment and materials are cleaned and stored according to workplace procedures</p>
9. Maintain integrated livestock on fish farm	<p>9.1Housing structure for <i>integrated livestock</i> is repaired and cleaned as outlined in the farm management plan</p> <p>9.2Target species is moved into the housing structures and stocked at densities recommended by an aquaculture technician</p> <p>9.3Livestock are fed according to the feeding schedule</p> <p>9.4Signs of stress and disease are noted and promptly reported to a livestock technician for action</p> <p>9.5Integrated livestock movement is controlled from the fish production sites as per identified risks</p> <p>9.6Livestock manure is completely decomposed and treated before fertilizing fish ponds as per the manual of standard operating procedures.</p>

RANGE

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

Variable	Range
1. Hazards may include but not limited to:	<ul style="list-style-type: none"> • Physical hazards • Chemical hazards <ul style="list-style-type: none"> • Heavy metals • Pesticides • Industrial chemicals • Biological hazards <ul style="list-style-type: none"> • Aquatic animal diseases • Naturally occurring toxins
2. Sources of hazards may include but not limited to:	<ul style="list-style-type: none"> • Poor feeding • Poor feed quality • Poor water quality • Human carriers • Cleaning agents • Pesticides • Industrial/ agricultural wastes

3. Preventing may include but not limited to:	<ul style="list-style-type: none"> • Good water quality • Sanitary measures • Proper use of antibiotics • Disease management • Parasite control • Use of quality feed • Good hygienic practices • Biosecurity measures • Probiotics
4. Correcting may include but not limited to:	<ul style="list-style-type: none"> • Disposal of contaminated fish • Fish treatment • Water flow management • Sterilization of the fish grow-out
5. Water fit for aquaculture include but not limited to	<ul style="list-style-type: none"> • Fish species specific recommended level of chlorine • Fish species specific Recommended pH range • Fish species specific Recommended Ammonia • Fish species specific recommended turbidity level • Free of infective pathogens
6. PPEs include but not limited to	<ul style="list-style-type: none"> • Safety goggles, gum boots, helmets, gloves, dust coats, first aid kits, industrial mouth piece
7. Pond preparation tools, equipment and materials include but not limited to:	<ul style="list-style-type: none"> • Measuring tape, weighing scale, wheelbarrow, pH meter, hoes, spades, rakes. • Lime, fertilizer, ropes,
8. Land-based fish culture units include but not limited to	<ul style="list-style-type: none"> • Earthen ponds, lined ponds, concrete tanks, plastic tanks, fiberglass, raceways
9. Maintenance tools, equipment and materials include but not limited to:	<ul style="list-style-type: none"> • Slashers, machetes, jembes, spades, wheelbarrow, rakes, gunny bags, scrapers, mowers
10. Screens include but not limited to:	<ul style="list-style-type: none"> • Wire mesh, grills, coffee tray wire, netting, sticks
11. Harvesting tools, equipment and materials include but not limited to:	<ul style="list-style-type: none"> • Seine net, scoop net, buckets, laundry baskets, weighing scale, perforators
12. Integrated livestock include but not limited to:	<ul style="list-style-type: none"> • Chicken, ducks, sheep, pigs

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Food safety risk assessment and communication
- Trouble shooting
- Use of tools and equipment
- Basic plumbing
- Pond construction
- Measuring
- Fish handling
- Record keeping
- Fish feeding
- Predator control
- Fish harvesting
- Communication
- Basic first aid
- Numeracy

Required Knowledge

The individual needs to demonstrate knowledge of:

- Food safety Standards (codes of practice for fish and fishery products)
- Regulatory bodies/ Competent authorities
- Hazard Analysis Critical Control Point (HACCP)
- Types of tools, equipment and PPEs
- Fish disease
- Basic fish biology
- Fish feeds and feeding methods
- Types and characteristics of fertilizers
- Water quality parameters
- Fish predators and intrusive animals
- Fish cages
- Basic animal husbandry

EVIDENCE GUIDE

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

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Implemented fish grow-out food safety plan 1.2 Drained and cleaned fish culture units 1.3 Identified and repaired defects on fish culture units
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	<ul style="list-style-type: none"> 1.4 Stocked fingerlings with minimal mortalities 1.5 Stored feeds under hygienic conditions 1.6 Monitored and controlled diseases, parasites and intruders on the farm 1.7 Harvested fish using appropriate tools 1.8 Handled integrated livestock using Best Management Practices (BMP) 1.9 Maintained a clean environment within and around the production units
2. Resource Implications for competence certification	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place 2.3 Materials relevant to the proposed activity or tasks
3. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral presentation 3.3 Oral questioning 3.4 Projects 3.5 Written tests
4. Context of Assessment	<p>Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

HANDLE HARVESTED FISH

UNIT CODE: AQ/OS/AM/CR/05/4/A

UNIT DESCRIPTION

This unit specifies the competencies required to hygienically handle harvested fish. It involves ability to implement fish harvesting food safety plan. It also includes preservation and processing of the fish and marketing of the fish and fish products. It further involves disposal of wastes emanating from fish preservation and processing.

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Implement Fish Harvesting Food Safety plan	1.1 Food safety <i>Hazards</i> in the fish handling are identified and documented. 1.2 Possible <i>sources</i> of physical, chemical and microbial contamination in the fish handling are identified based on the hazards 1.3 Standard operating procedures for <i>preventing</i> and <i>correcting</i> fish feed safety risks are implemented based on the identified risks.
2. Prepare harvested fish for preservation	2.1 <i>PPEs</i> are identified and gathered as per task requirements 2.2 <i>Tools, equipment and materials</i> are assembled in line with task requirements 2.3 Harvested fish is graded according to size and species as per the target market while observing good hygiene practices 2.4 Fish is cleaned with potable water to remove all slime and foreign materials 2.5 Fish is de-scaled based on target market requirements 2.6 Fish is gutted to remove visceral material without rupturing (intact) 2.7 Gutted fish is cleaned with potable water to remove blood stains and gut remains from stomach cavity
3. Preserve harvested fish	3.1 Fish is preserved as per code of hygiene practice for the handling, processing, storage and the placing on the market of fish and fisheries products 3.2 Fish meant for short term preservation is kept in appropriate containers with ice in alternate layers following standard icing procedures

	3.3 Fish meant for long term preservation is smoked, sundried, salted or frozen depending on market preference while observing food hygienic practices and control measures for identified food safety risks
4. Process harvested fish	<p>4.1 Fish for processing is handled, stored, transported and processed according to code of hygiene practice for the handling, processing, storage and the placing on the market of fish and fisheries products</p> <p>4.2 Whole fish is filleted as per target market specifications</p> <p>4.3 Fish mince is prepared out of fish fillets or trimmings using recommended technique</p> <p>4.4 Whole fish, fish fillets or portions are deep fried to a golden-brown color</p> <p>4.5 Fish balls are prepared from fish trimmings or fish mince according to target market specification</p> <p>4.6 Packaging tools, equipment and materials are assembled in line with task requirements</p> <p>4.7 Processed fish products are packaged using food grade material appropriate to type, size and weight of the product</p> <p>4.8 Packaged product is labelled according to statutory regulations and target market requirements</p> <p>4.9 Packaged products are stored in designated areas using the FIFO approach</p> <p>4.10 Storage conditions of stored fish products and are monitored regularly</p>
5. Manage waste from fish processing	<p>5.1 Fish processing wastes are collected at every stage and separated according to their physical state.</p> <p>5.2 Collected wastes are handled to avoid cross contamination and harboring of pests</p> <p>5.3 Solid and liquid wastes are disposed of as per standard operating procedures and in compliance to the environmental management and coordination Act (waste management regulations)</p>
6. Market fish and fish products	<p>6.1 Fish for sale is handled, stored, transported and processed according to code of hygiene practice for the handling, processing, storage and the placing on the market of fish and fisheries products</p> <p>6.2 Price of fish and fish products is determined based on costs of production.</p> <p>6.3 Market outlets are identified and contacted</p> <p>6.4 Appropriate mode of transport to market is determined according to product form and quantities, and distance to market</p>

	6.5 Fish and fish products are sold at a profit 6.6 Records of sales proceeds are maintained according to workplace requirements
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RANGE

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

Variable	Range
1. Hazards may include but not limited to:	<ul style="list-style-type: none"> • Physical • Microbial • Pathogenic bacteria <ul style="list-style-type: none"> • e.g. Salmonella spp. • Chemical contaminants <ul style="list-style-type: none"> • e.g. Histamine • Viruses <ul style="list-style-type: none"> • e.g. Hepatitis • Fungi <ul style="list-style-type: none"> • Moulds • Foreign matter <ul style="list-style-type: none"> • Hair • Jewellery • Pests
2. Sources of hazards may include but not limited to:	<ul style="list-style-type: none"> • Personnel hygiene facilities and toilets • Cleaning agents • Wash water quality • Equipment and facilities • Lubricants • Wastes

<p>3. Preventing may include but not limited to:</p>	<ul style="list-style-type: none"> • Personal hygiene • Personnel health checks every 6 months • Use of food grade cleaning agents and lubricants • Pest control • Fraud control • Use of potable water • Use of food grade equipment • Proper storage conditions • Maintenance and sanitation of equipment and facilities • Temperature controls (below 4°C) • Plant hygiene • Biosecurity measures • PPEs • Waste management
<p>4. Correcting may include but not limited to:</p>	<ul style="list-style-type: none"> • Disposal of contaminated fish • Sterilization of the fish handling plant
<p>5. PPEs include but not limited to</p>	<ul style="list-style-type: none"> • Gum boots, head cover, gloves, dust coats, first aid kits, mouth piece, apron
<p>6. Tools, equipment and materials include but not limited to:</p>	<ul style="list-style-type: none"> • Basins, buckets, hard brush, filleting tables, knives, waste disposal containers, ice box, smoking kiln, solar dryer, drying racks, drying mats or canvass, domestic freezers, ice, salt, frying oil, meat mincer, blender, crockery,
<p>7. Packaging tools, equipment and materials</p>	<ul style="list-style-type: none"> • Weighing balance, polybags, cartons, gunny bags, ice packs, baskets, cool boxes, sealing tape, labels, pallets, wheel barrow.

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

The individual needs to demonstrate the following skills:

- Food safety risk assessment and communication
- Trouble shooting
- Use of tools and equipment
- Weighing
- Fish handling
- Fish preservation

- Fish processing
- Packaging
- Record keeping
- Communication
- Basic first aid
- Numeracy

Required Knowledge

The individual needs to demonstrate knowledge of:

- Food safety Standards (codes of practice for fish and fishery products)
- Regulatory bodies/ Competent authorities
- Hazard Analysis Critical Control Point (HACCP)
- Types of tools, equipment and PPEs
- Fish spoilage
- Fish handling, processing and preservation
- Marketing and market dynamics
- Workplace safety regulations

EVIDENCE GUIDE

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

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Implemented fish harvesting food safety plan 1.2 Graded fish into uniform sizes by species 1.3 Cleaned fish to remove all slime and foreign materials 1.4 Guttled fish to remove all visceral material 1.5 Preserved fish using appropriate method 1.6 Processed fish into various products 1.7 Packaged and stored fish products in designated areas 1.8 Marketed fish products 1.9 Observed hygienic standards 1.10 Disposed of waste from fish processing
<p>2. Resource Implications for competence certification</p>	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place 2.3 Materials relevant to the proposed activity or tasks

3. Methods of Assessment	Competency may be assessed through: 3.1 Observation 3.2 Oral presentation 3.3 Oral questioning 3.4 Simulation 3.5 Written tests
4. Context of Assessment	Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

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